

Package ‘YourCast’

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Title Forecasting age-sex-country-cause mortality rates

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Depends R (>= 2.15.0), ggplot2

Imports grid, gridExtra, lattice, foreign, reshape2

Description Software accompanying the book by Girosi and King: Demographic Forecasting. Four different forecast models (i.e, OLS, LC, POISSON, and MAP). The driver of the simulation is function mortality.driver(), with your choices of input parameters, such as country, disease, and gender, and many others; please read the software manual.

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URL <http://gking.harvard.edu>

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array.yourcast	<i>Array generation tool for YourCast</i>
----------------	---

Description

Creates array from YourCast output for each geographical unit.

Usage

```
array.yourcast(x, unlog=FALSE)
```

Arguments

x	A yourcast output object.
unlog	Logical. Should the dependent variable be unlogged? Default: FALSE.

Value

Creates array(s) from [yourcast](#) output. One array is created per geographic area. If there is one geographic area, an array is returned; else, a named list of arrays is returned. Each array is of size T (number of times) by A (number of ages) by 3, where the last dimension captures the type of data: y (observed values), \hat{y} (predicted values), and comb (observed values in-sample and predicted values out-of-sample).

Author(s)

Konstantin Kashin <kkashin@fas.harvard.edu>.

References

<http://gking.harvard.edu/yourcast>

See Also

[yourcast](#) function and documentation (`help(yourcast)`)

Examples

```
# Run Lee-Carter model for Figure 2.6 in Demographic Forecasting
data(chp.2.6.1)
ff.allc <- log(allc2/popu2) ~ time
ylc.allc <- yourcast(formula=ff.allc, dataobj=chp.2.6.1, model="LC",
                    elim.collinear=FALSE,
                    sample.frame=c(1950,2000,2001,2060))

yc.array <- array.yourcast(ylc.allc)
dimnames(yc.array)

# predicted mortality rates (observed in-sample and predicted out-of-sample)
yc.array[,,"comb"]
```

chp.11.1.RData

Respiratory infections, Belize

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(chp.11.1)
```

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 11.1 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

```
demo(chp.11.1)
```

chp.11.10

Breast cancer, Chile, Cuba, Belgium, and the Netherlands

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(chp.11.10)
```

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 11.10 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.11.10)

chp. 11. 11

Transportation Accidents, Argentina and Chile

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

data(chp.11.11)

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 11.11 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.11.11)

chp.11.12

Transportation Accidents, Argentina

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(chp.11.12)
```

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 11.12 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

```
demo(chp.11.12)
```

chp.11.13

Transportation Accidents, Argentina, Chile, Canada, Colombia, Costa Rica, Cuba, and USA

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(chp.11.13)
```

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 11.13 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.11.13)

chp. 11.2

Respiratory infections, Bulgaria

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

data(chp.11.2)

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 11.2 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.11.2)

chp. 11.3

Respiratory infections, Bulgaria

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

data(chp.11.3)

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 11.3 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.11.3)

chp. 11.4

Lung Cancer, Peru

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

data(chp.11.4)

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 11.4 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.11.4)

chp. 11.5

Lung Cancer, Trinidad and Tobago and Ukraine

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

data(chp.11.5)

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 11.5 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.11.5)

chp.11.7.1

Lung Cancer, 51 countries

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

data(chp.11.7.1)

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to calculate empirical priors for the 'map' model used in figure 11.7 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.11.7)

chp.11.7.2

Lung Cancer, Peru

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

data(chp.11.7.2)

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 11.7 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.11.7)

chp.11.8.1

Lung Cancer, 51 countries

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

data(chp.11.8.1)

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to calculate empirical priors for the 'map' model used in figure 11.8 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.11.8)

chp.11.8.2

Lung Cancer, Ukraine

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

data(chp.11.8.2)

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 11.8 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.11.8)

chp.11.8.3

Lung Cancer, Trinidad and Tobago

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

data(chp.11.8.3)

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 11.8 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.11.8)

chp. 11.9.1

Breast Cancer, 43 countries

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

data(chp.11.9.1)

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to calculate empirical priors for the 'map' model used in figure 11.9 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.11.9)

chp.11.9.2

Breast Cancer, Croatia

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

data(chp.11.9.2)

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 11.9 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.11.9)

chp.2.6.1

All causes of death, New Zealand and Hungary

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

data(chp.2.6.1)

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 2.6 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.2.6)

chp. 2. 6. 2

Transportation accidents (males), Portugal

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

data(chp.2.6.2)

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 2.6 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.2.6)

chp.2.7.1

Suicide deaths (male), USA

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

`data(chp.2.7.1)`

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 2.7 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

`demo(chp.2.7)`

chp.2.7.2

Female digestive disease, Hungary

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

`data(chp.2.7.2)`

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 2.7 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.2.7)

chp. 2. 7. 3

Female cervix cancer, United Kingdom

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

data(chp.2.7.3)

Format

A YourCast 'dataobj' input object: a list of a list of cross sectional dataframes, dataframe of geographic names, and string indicating CSID coding rule. Used to create figure 2.7 in *Demographic Forecasting*.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

See Also

demo(chp.2.7)

cntry.codes

Country codes and names for yourprep example

Description

World Health Organization data 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg== Murray Research Archive

Usage

data(cntry.codes)

Format

A fixed width '.txt' file.

Details

191 countries included.

Source

WHO

References

<http://gking.harvard.edu/yourcast>

See Also

example(yourprep)

csid204500

yourprep example file for Belize, age 0

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

data(csidge204500)

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 0. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

csid204505

yourprep example file for Belize, age 5

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(csid204505)
```

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 5. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

csid204510

yourprep example file for Belize, age 10

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(csidge204510)
```

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 10. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

csidge204515

yourprep example file for Belize, age 15

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(csidge204515)
```

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 15. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

csid204520

yourprep example file for Belize, age 20

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(csidge204520)
```

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 20. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

csid204525

yourprep example file for Belize, age 25

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(csid204525)
```

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 25. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

csid204530

yourprep example file for Belize, age 30

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(csid204530)
```

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 30. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

csid204535

yourprep example file for Belize, age 35

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(csidge204535)
```

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 35. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

csid204540

yourprep example file for Belize, age 40

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(csid204540)
```

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 40. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

csid204545

yourprep example file for Belize, age 45

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(csid204545)
```

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 45. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

csid204550

yourprep example file for Belize, age 50

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(csidge204550)
```

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 50. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

csid204555

yourprep example file for Belize, age 55

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(csid204555)
```

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 55. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

csid204560

yourprep example file for Belize, age 60

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(csid204560)
```

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 60. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

csid204565

yourprep example file for Belize, age 65

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(csidge204565)
```

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 65. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

csid204570

yourprep example file for Belize, age 70

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(cs204570)
```

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 70. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

csid204575

yourprep example file for Belize, age 75

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(cs204575)
```

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 75. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

csid204580

yourprep example file for Belize, age 80

Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, *Cause of Death Data*, hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg==Murray Research Archive

Usage

```
data(csidge204580)
```

Format

A fixed width '.txt' file.

Details

Example cross section dataframe for Belize, age 80. To be used in with Example section in user's manual.

Source

World Health Organization

References

<http://gking.harvard.edu/yourcast>

histograph

Histograms for model ebayes

Description

Draws histograms for priors calculated by model ebayes.

Usage

```
histograph(d1.a, d1.t, dt.da, SD, depvar=" ",
           model="ebayes", graphics.file=NA)
```

Arguments

d1.a	Numeric vector. First derivative respect to age.
d1.t	Numeric vector. First derivative respect to time.
dt.da	Numeric vector. Second derivative respect to age and time.
SD	Numeric vector. Standard deviation.
depvar	String with the name of the dependent variable. Default: " "
model	String with the name of the model. Default: "ebayes".
graphics.file	String or NA. If string the name of a file to be appended to a directory path where the graphics will be saved, if NA it is displayed in the screen and not saved. Default: NA.

Value

Histograms of the vectors d1.a, d1.t, dt.da, and SD; see demos chp.11.7, chp.11.8, or chp.11.9.

Author(s)

Federico Girosi <girosi@rand.org>

References

<http://gking.harvard.edu/yourcast>

lifetable

*Life table calculation for YourCast***Description**

Creates a list of observed and predicted period life tables across from YourCast output for each geographical unit. This function should only be used when forecasting all-cause mortality rates.

Usage

```
lifetable(obj, ax=0.5, a0=0.07, nx=NULL, dv.log=NA)
```

Arguments

obj	A yourcast output object containing all-cause mortality rates.
ax	A scalar, numeric vector of length A , or a numeric T by A matrix specifying the average years lived within a given age interval $[x, x + n)$ by individuals who die within that age interval. If a scalar, ax is assumed to be constant across all age intervals (except for the first age interval; see a0) and across time. If a vector, ax is assumed to be constant across time. See ‘Details’. Default: 0.5.
a0	A scalar indicating the average years lived within the first age interval by individuals who die within that age interval. Ignored if ax is a vector or a matrix. Default: 0.07.
nx	A scalar or vector of length A defining the age interval widths. If a scalar, the age intervals have identical widths. If NULL, the age interval widths are calculated using the ages in the yourcast object. The last age interval is assumed to be open-ended so its length is set to NA. Default: NULL.
dv.log	Logical. Is the dependent variable logged? If NA, the function parses the formula in the yourcast object to determine if the dependent variable was logged. Default: NA.

Details

The input must be a [yourcast](#) object containing forecasts of all-cause mortality rates. The death rates do not have to be for one-year age intervals, albeit ax and a0 should be adjusted accordingly based on the age interval size. The rates may either be logged or unlogged. If dv.log is set to NULL, the function parses the formula automatically to determine whether the rates are logged. Setting dv.log to TRUE or FALSE manually sets whether the rates are logged or not.

Specifying ax is necessary to convert mortality rates into conditional probabilities of death. Suppose that m_x is the mortality rate for the n -year age interval $[x, x + n)$. a_x is then defined as the average years lived within the age interval $[x, x + n)$ by individuals who die at that age. The default value of a_x is 0.5, which means that individuals on average live half the year within the age that they die (for single-year age intervals). The default value of a_0 is set to 0.07, following the reported values within the Human Mortality Database for adult females in the United States for the $[0, 1)$ age interval in the last decade.

Alternatively, one can specify a_x as a vector of length A , where A is the number of age intervals. In this case, a_x is assumed to be constant across time for each age interval. One can also pass a T by A matrix, in which case a_x is allowed to vary over time.

The last age interval is open-ended: $[x, \infty)$. The conditional probability of death is set to 1 and a_x is automatically set to $1/m_x$.

Value

If a single geographic area, a list with names `obs` and `pred` is returned, where the elements are life table arrays calculated using observed and predicted mortality rates, respectively. If multiple geographic areas, a named list of geographic areas is returned, where each element contains a list of observed and predicted life tables.

Each life table array has dimensions T by A by 10, where the third dimension contains the following variables:

<code>x</code>	Age interval.
<code>nx</code>	Length of age interval.
<code>ax</code>	Average years lived within age interval by individuals who die during that age interval.
<code>qx</code>	Conditional probability of death for the age interval.
<code>px</code>	Conditional probability of survival for the age interval.
<code>lx</code>	Number of survivors at the start of the age interval. Set to 100,000 for the first age interval.
<code>dx</code>	Number of individuals dying within the age interval.
<code>Lx</code>	Person-years lived by individuals in the age interval.
<code>Tx</code>	Person-years remaining at start of age interval.
<code>ex</code>	Remaining life expectancy at start of age interval.

Author(s)

Konstantin Kashin <kkashin@fas.harvard.edu>

References

Preston, S.H., Patrick Heuveline, Michel Guillot. (2000) *Demography: Measuring and Modeling Population Processes*. Blackwell Publishing.

Wilmoth, J.R. et al. "Methods Protocol for the Human Mortality Database" <http://www.mortality.org/>.

<http://gking.harvard.edu/yourcast>

See Also

[yourcast](#) function and documentation (`help(yourcast)`)

Examples

```
# Run Lee-Carter model for Figure 2.6 in Demographic Forecasting
data(chp.2.6.1)
ff.allc <- log(allc2/popu2) ~ time
ylc.allc <- yourcast(formula=ff.allc, dataobj=chp.2.6.1, model="LC",
                    elim.collinear=FALSE,
                    sample.frame=c(1950,2000,2001,2060))

# calculate lifetable function assuming ax=2.5 and a0=1.907
# a0 calculated for both males and females from
# Human Mortality Database for New Zealand for 2000
lt <- lifetable(ylc.allc,ax=2.5,a0=1.907)

# observed lifetable for csid 5150 (New Zealand) for 2000
lt[["5150"]]$obs["2000",,]

# predicted lifetable for csid 5150 (New Zealand) for 2015
lt[["5150"]]$pred["2015",,]
```

plot.yourcast

*Plot generation tool for YourCast***Description**

Creates graphics from YourCast output for each geographical unit and prints to the device window or a .pdf file in the specified directory.

Usage

```
## S3 method for class 'yourcast'
plot(x, plots=c("age","time"), title=NULL, subtitle=NULL,
     age.opts=list(), time.opts=list(), threedim.opts=list(),totcount.opts=list(),
     ex0.opts=list(),print="device", print.args=list(), dv.log=NA, ...)
```

Arguments

x	A yourcast output object.
plots	Vector of strings specifying the plot types to be generated. The available plots are age profile ("age"), time profile ("time"), 3D age/time profile ("threedim"), total counts by year ("totcounts"), and life expectancy at birth ("ex0"). The order in which the plots are specified is the order in which they are generated in the device. A maximum of 3 plot types is allowed. Default: c("age", "time").
title	String. Main title for the plots. Concatenated with country name if dataobj\$G.names exists. Default: NULL.
subtitle	String. Subtitle for the plots. Default: NULL.
age.opts	A list of options for the age profile plot. See 'Details'.
time.opts	A list of options for the time profile plot. See 'Details'.

threedim.opts	A list of options for the 3D plot. See ‘Details’.
totcount.opts	A list of options for the total counts plot. See ‘Details’.
ex0.opts	A list of options for the life expectancy at birth plot. See ‘Details’.
print	String specifying whether graphical output should be displayed sequentially on a device window ("device") or saved directly to a '.pdf' file in the dpath ("pdf"). Default: "device".
print.args	A list of options for the device. See ‘Details’.
dv.log	Logical. Is the dependent variable logged? If NA, the function parses the formula in the <code>yourcast</code> object to determine if the dependent variable is logged. Default: NA.
...	Further arguments passed to or from other methods.

Details

Plots age profiles, time profiles, 3D age/time profiles, total counts (by time), and life expectancy at birth from `yourcast` output. Total count (by time) plots should only be used if forecasting counts (eg. population or death counts) and life expectancy at birth should only be used if forecasting mortality rates - both are common quantities of interest calculated from these forecasts and are thus included in the function. See `lifetable` for details of life expectancy at birth calculations from mortality rates. All plots are created using the `ggplot2` package, except for the 3D age/time profile, which is created using the `wireframe` function from the `lattice` library.

The function supports multiple plots in each call (up to 3) and arranges them horizontally in the order specified in `plots` argument. The device window is automatically resized to accommodate different number of plots, albeit device width and height may be specified manually through the `print.args` option (see below).

Plots are titled with the `title` and the `G.names` dataframe if it was supplied to `yourcast` in the `dataobj`. For example if `title="Respiratory Infections"` and the geographic identifier for that region is matched with "Belize", the plot will be titled "Respiratory Infections, Belize". One or both labels will be utilized by the function if available. A subtitle may also be specified through `subtitle`.

It is important to note that `plot.yourcast` will only work if all cross sections within the same geographic unit are of the same dimensions. If, for example, a cross section for one age group has fewer yearly observations than another from the same group, these missing years must be filled in with NA, even if they occur in the beginning of the sample period. This does not hold across geographic units, however.

Finally, note that `plot.yourcast` opens a new device window for each new plot. This is done so that the size of the device can be controlled to keep the side-by-side plots from appearing distorted when launched.

Options for ‘age’, ‘time’, ‘totcount’, and ‘ex0’ plots

Options for the age profile, time profile, total count, and life expectancy at birth plots may be specified using the `age.opts`, `time.opts`, `totcount.opts`, and `ex0.opts` arguments, respectively, which are lists with any of following components:

`xlab` String specifying the x-axis label. Default is "Age" for ‘age’ plots and "Time" for ‘time’, ‘totcount’, and ‘ex0’ plots.

`ylab` String specifying the y-axis label. Default is "Data and Forecasts" for 'age' plots and "Forecasts" for 'time' plots.

`insamp.obs` Logical. Should the observed data be plotted? Default for 'age', 'totcounts', 'ex0' is TRUE; default for 'time' is FALSE.

`insamp.predict` Logical. Should the predicted data be plotted for the in-sample period? Default: TRUE.

Additionally, the following options may be passed to `age.opts` and `time.opts` lists:

`age.select` A numeric vector listing the ages to be plotted. If a scalar is supplied, it is used as the step size in a sequence of ages between the minimum and the maximum age. If NULL, all ages are plotted. Default: NULL.

`time.select` A numeric vector listing the times to be plotted. If a scalar is supplied, it is used as the step size in a sequence of times between the minimum and the maximum time. If NULL, all times are plotted. Default: NULL.

`unlog` Logical. Should the dependent variable be unlogged for 'age' and 'time' plots? Ignored if `dv.log` is set to FALSE. Default: FALSE.

Option `age.select` may be included in the `totcount.opts` list, but it functions differently than for the 'age' and 'time' plots. Instead of designating the ages to plot, `age.select` should be a numeric vector listing the ages to be summed over in the calculation of total counts over time.

For 'ex0' plots, options `ax`, `a0`, and `nx` that control the calculation of life tables from mortality rates in `yourcast` objects may be included in the `ex0.opts` list. By default, `ax` is set to 0.5, `a0` is set to 0.07, and `nx` is set to NULL. See [lifetable](#) for additional information.

Options for 'threedim' plot

Options for the 3D age/time profile may be specified through `threedim.opts`. The argument must be a list with any of the following components:

`xlab` String specifying the x-axis label. This corresponds to the time dimension. Default: "Time".

`ylab` String specifying the y-axis label. This corresponds to the age dimension. Default: "Age".

`zlab` String specifying the z-axis label. This corresponds to the dependent variable. Default: "Forecasts"

`insamp.pred` Logical. If TRUE, the forecasted data is plotted for the in-sample period. If FALSE, the observed data is plotted instead. Default: TRUE.

`unlog` Should the dependent variable be unlogged? Ignored if `dv.log` is set to FALSE. Default: FALSE.

`args.wireframe` A list of arguments (must be labeled) to be passed to `wireframe`. Note that some arguments to `wireframe` such as `zlab` and `screen` should be made as arguments to `threedim.opts`; they will be overwritten if found in `args.wireframe`.

`screen` List with three elements 'x', 'y', and 'z' that rotate the viewing angle for the 3D plot. Default: `list(z=-40, x=-60, y=0)`.

Print options

The function prints sequentially to the device or saves '.pdf' files with the requested plot for each geographic unit in the sample. If requested, '.pdf' files will be saved in a specified directory or the working directory. Use `print.args` to set print options:

height Height of device. Default is 5 inches.

width Width of device. Default width adjusts automatically according to number of plots.

filename A string or vector of strings denoting the filename(s) of '.pdf's created for each geographical area if print="pdf". If a string, the csid code is automatically appended if multiple geographies so as to ensure unique filenames. If the vector is of the length equal to the number of geographies, the csid is not appended, albeit the order of the labels should be the same as the order of the areas in dataobj\$data. Default: NULL, in which case plots are titled as plotgggg.pdf, where gggg denotes the csid.

dpath A string giving the directory where '.pdf' files will be output if print="pdf". Default: getwd().

Value

Device windows with requested plots or '.pdf' files saved in the dpath.

Author(s)

Konstantin Kashin <kkashin@fas.harvard.edu>, based on an earlier version by Jon Bischof.

References

<http://gking.harvard.edu/yourcast>

See Also

[yourcast](#) function and documentation (help(yourcast))

Examples

```
# Run Lee-Carter model for Figure 2.6 in Demographic Forecasting
data(chp.2.6.1)
ff.allc <- log(allc2/popu2) ~ time
ylc.allc <- yourcast(formula=ff.allc, dataobj=chp.2.6.1, model="LC",
                    elim.collinear=FALSE,
                    sample.frame=c(1950,2000,2001,2060))

# default
plot(ylc.allc,title="All causes of death")

## Not run:
# output plots to pdf
plot(ylc.allc,title="All causes of death", print="pdf")

# output plots to pdf with names "acd"+csid
plot(ylc.allc,title="All causes of death", print="pdf",
     print.args=list(filename="acd"))

# order matters
plot(ylc.allc,plots=c("time","age"),title="All causes of death")
plot(ylc.allc,plots=c("age","time"),title="All causes of death")
## End(Not run)
```

```

# remove in-sampled predicted data from age profile plot
plot(ylc.allc,title="All causes of death",age.opts=list(insamp.predict=FALSE))

# plot every 10th age instead of every 5th age for age profile plot
plot(ylc.allc,title="All causes of death",
age.opts=list(insamp.predict=FALSE,age.select=10))

## Not run:
# plot every 5th year instead of every year for time series plot
plot(ylc.allc,title="All causes of death",
age.opts=list(insamp.predict=FALSE,time.opts=list(time.select=5))

# only plot data from 2000+
plot(ylc.allc,title="All causes of death",
age.opts=list(insamp.predict=FALSE, time.select=seq(2001,2060,5)),
time.opts=list(time.select=seq(2001,2060,5)))

# plot unlogged mortality rates
plot(ylc.allc,title="All causes of death",
age.opts=list(insamp.predict=FALSE, unlog=TRUE),time.opts=list(unlog=TRUE))

# plot `threedim` plot in addition to age and time profiles
plot(ylc.allc,plots=c("threedim","age","time"),
title="All causes of death",age.opts=list(insamp.predict=FALSE))

# plot life expectancy at birth in addition to age and time profiles
# since these are 5-year age groups, assume ax=2.5 and a0=1.907
plot(ylc.allc,plots=c("ex0","age","time"),title="All causes of death",
age.opts=list(insamp.predict=FALSE), ex0.opts=list(a0=1.907,ax=2.5))
## End(Not run)

```

```
print.summary.yourcast
```

Print method for yourcast summary output

Description

summary.yourcast class print function

Usage

```
## S3 method for class 'summary.yourcast'
print(x, ...)
```

Arguments

x [summary.yourcast](#) output object to be printed
... Arguments to be passed to or from other methods.

Author(s)

Jon Bischof <jbischof@fas.harvard.edu>

References

<http://gking.harvard.edu/yourcast>

See Also

[yourcast](#), [summary.yourcast](#)

print.yourcast	<i>Print method for yourcast output</i>
----------------	---

Description

yourcast class print function

Usage

```
## S3 method for class 'yourcast'  
print(x, ...)
```

Arguments

x [yourcast](#) output object to be printed
... Arguments to be passed to or from other methods.

Author(s)

Jon Bischof <jbischof@fas.harvard.edu>

References

<http://gking.harvard.edu/yourcast>

See Also

[yourcast](#)

print.yourprep	<i>Print method for yourprep output</i>
----------------	---

Description

yourprep class print function

Usage

```
## S3 method for class 'yourprep'  
print(x, ...)
```

Arguments

x [yourprep](#) output object to be printed
... Arguments to be passed to or from other methods.

Author(s)

Jon Bischof <jbischof@fas.harvard.edu>

References

<http://gking.harvard.edu/yourcast>

See Also

[yourprep](#)

proximity	<i>Proximity data for yourprep example</i>
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Description

World Health Organization data years 1920-2000. Federico Girosi and Gary King, 2006, "Cause of Death Data", hdl:1902.1/UOVMCPSWOL UNF:3:9JU+SmVyHgwRhAKclQ85Cg== Murray Research Archive

Usage

```
data(proximity)
```

Format

A fixed width '.txt' file.

Source

WHO

References<http://gking.harvard.edu/yourcast>**See Also**

example(yourprep)

summary.yourcast	<i>Summarize yourcast output</i>
------------------	----------------------------------

Description

yourcast class summary function

Usage

```
## S3 method for class 'yourcast'
summary(object, ...)
```

Arguments

object	yourcast output object to be summarized
...	Arguments to be passed to or from other methods.

Value

A list of summary objects of class 'summary.yourcast':

sample.frame	Four element vector containing, in order, the start and end time periods to be used for the observed data and the start and end time periods to be forecast
params	Vector. Smoothing parameters used in model.
model	String. Estimation technique used.
formula	Language. Formula used in analysis.
numcs	Integer. Number of cross sections used in analysis.
centry.codes	Vector. Unique geographical codes of cross sections used in analysis.
centry.names	Vector. If G.names dataframe submitted to yourcast , the names of all unique geographical codes of cross sections used in analysis.
coef	List. List of matrices with estimated coefficients for each cross section. For Lee-Carter models, only one set of coefficients calculated. Standard errors are not calculated for these coefficients.

Author(s)

Jon Bischof <jbischof@fas.harvard.edu>

References

<http://gking.harvard.edu/yourcast>

See Also

[yourcast,print.summary.yourcast](#)

<code>user.prompt</code>	<i>Scan user input</i>
--------------------------	------------------------

Description

Gets user response to continue with the demos simulation or to quit.

Usage

`user.prompt()`

Details

Allows users to terminate demos early.

Value

None.

Author(s)

Jon Bischof <jbischof@fas.harvard.edu>

References

<http://gking.harvard.edu/yourcast>

See Also

See demos; for example: `demo(chp.11.4)`

yourcast

*Time-series cross-sectional Forecasting***Description**

Runs a set of regression models to forecast time-series cross-sectional data by either considering independent regressions in each cross-sectional unit or by using a variety of techniques to smooth across units.

Usage

```
yourcast(formula=NULL, dataobj=NULL, sample.frame=c(1950,2000,2001,2030),
         standardize=TRUE, elim.collinear=FALSE,
         tol=0.9999, solve.tol = 1.e-10,svdtol=10^(-10),
         userfile=NULL, savetmp = T, model.frame=FALSE,
         debug = F, rerun= "yourcast.savetmp",
### specific to models
         model="OLS",zero.mean=FALSE,
#### smooth over ages
         Ha.sigma = 0.3,
         Ha.sigma.sd= 0.1, Ha.deriv=c(0,0,1),
         Ha.age.weight=0, Ha.time.weight=0,
#### smooth over time
         Ht.sigma= 0.3,
         Ht.sigma.sd=0.1, Ht.deriv=c(0,0,1),
         Ht.age.weight=0, Ht.time.weight=0,
#### smooth over age-time
         Hat.sigma=0.2,
         Hat.sigma.sd=0.1,Hat.a.deriv=c(0,1),Hat.t.deriv=c(0,1),
         Hat.age.weight=0,Hat.time.weight=0,
#### smooth over centry-time
         Hct.sigma=0.3, Hct.sigma.sd =0.1,
         Hct.t.deriv=1, Hct.time.weight = 0,
         LI.sigma.mean=0.2,LI.sigma.sd = 0.1, nsample= 500,
         low.pow=T, verbose=TRUE)
```

Arguments

formula A standard R formula of the form $y \sim x_1 + x_2$, except that an explanatory variable is included for a particular cross-section only if it is both listed in the formula and available in that cross-section's data set (see `dataobj`). Explanatory variables in the formula but not available for a cross-section (or in a cross-sectional dataset but not in the formula) are excluded. (For mortality forecasting, the specification looks like $\log(\text{deaths}/\text{population}) \sim x_1 + x_2$, with `deaths` and `population` stored as separate variables in each dataframe.) (May be set to `NULL` if `savetmp` was set to `TRUE` on the last run, in which case the value of `formula` will come from the saved file.)

dataobj	<p>A object of class ‘yourcast’ or equivalent. See <code>help(yourprep)</code> for more details.</p> <p>The dataobj may be supplied in one of four ways. Most commonly, the argument will specify (1) an object (in working memory) or (2) a string with the name of a file in the working directory. However, if (3) dataobj is a string referring to a directory on disk, then each element of the list above should be stored in a file in that directory, with element ‘data’ consisting of a subdirectory containing separate ASCII data files. (If this option is chosen, a complete data object, called ‘dataobj.Rdata’, will be stored in the directory named, and it will be loaded automatically if yourcast is run again with this chosen option.) (4) The last option is for dataobj to be set to NULL, after which the function will look for a ‘yourcast.savetmp’ file in the working directory from a previous run of the function where the argument savetmp was set to TRUE.</p> <p>The function <code>yourprep</code> is available to help construct the dataobj in the proper format from individual cross section files in the working directory or the workspace. This function also performs a number of diagnostics to ensure that the data is entered properly and can be read by yourcast. See <code>help(yourprep)</code> for more information</p>
sample.frame	<p>Vector. A four element vector containing, in order, the start and end time periods to be used for the observed data and the start and end time periods to be forecast. Years identified here that are not available for a cross-section are ignored. Default: <code>c(1950, 2000, 2001, 2030)</code>.</p>
standardize	<p>Boolean. Should the covariates in each cross-sectional unit be standardized (to zero mean and standard deviation of 1)? Standardization is performed for both the in- and out-of-sample periods. Default: TRUE.</p>
elim.collinear	<p>Boolean. Whether collinearity among covariates should be tested and those that are collinear should be eliminated. Default: FALSE.</p>
tol	<p>Double scalar. Tolerance to find collinearities among covariates. Default: <code>0.9999</code>.</p>
solve.tol	<p>A real number smaller than one that is used in the argument of the R-function <code>solve</code> to invert matrices (see description for <code>tol</code>). Default: 1^{-10}.</p>
svdtol	<p>A scalar; the tolerance used in inverting a matrix by SVD. Default: 10^{-10}.</p>
userfile	<p>A string with the name of a file that contains your values for some or all of yourcast’s arguments. This file contains R code that changes default values of arguments. E.g., the file might contain:</p> <pre> index.code <- 30 data <- "WHOmortalityData" </pre> <p>If an option is specified in userfile, it takes precedence over command line options, so it is normally best to specify each option in either the userfile or the command line but not both. Default: NULL</p>
savetmp	<p>If TRUE, yourcast saves a file in the default directory (called ‘yourcast.savetmp’) with preliminary calculations. If the value of formula or dataobj is missing when yourcast is called, yourcast will get their values from this file, if it exists. This saves a minute or so of computing time for large data sets and is useful for multiple runs on the same data with different formulas specified or different</p>

	prior values. If FALSE, no file is saved. (The structure of ‘yourcast.savetmp’ is for the convenience of yourcast and is not intended to be read by the user or saved for more than one run.) Default: TRUE.
model.frame	If TRUE, include entire input dataobj in the output object. Default: FALSE.
debug	Boolean. It puts the environment that contains parameters and arguments of the simulation in the user workspace. Default FALSE.
rerun	String. The name of the file that is saved in the default directory with preliminary calculations; see savetmp. Default: yourcast.savetmp
model	A string indicating the forecasting method, including: Bayes maximum a posteriori (map), Bayes with Gibbs sampling (bayes), Ordinary Least Squares (ols), Poisson (poisson), and Lee-Carter (LC). Default: ols. (We usually recommend map.) yourcast also includes a procedure to help users set the sigma parameters below automatically for the case of model=map, and smoothing over age, time, or age and time, but for only one country. You may do this by running a preprocessing instance of yourcast first by setting this parameter to ebayes and using either the data to be analyzed or a larger data set which is likely to have similar or related parameter values. When ebayes is chosen, the yourcast output object will contain only the parameter values to feed into the next run of yourcast.
zero.mean	A boolean or named vector with a value of $\bar{\mu}$ for each age group. If TRUE, the prior has zero mean. If FALSE, the prior has nonzero mean centered around the observed mean age profile (i.e., the average of Y over time and levels of the geographic index for each age group). Default: FALSE.
Ha.sigma	This can be set in one of three ways: (1) a scalar which sets σ_a , the prior standard deviation of $E(Y)$, indicating how much to smooth $E(Y)$ over age groups (which may vary over geographic areas and time periods, and with the standard deviations averaged over age groups). A larger standard deviation represents more prior uncertainty, which allows the data to play a greater role. (2) NA to not smooth in this way. (3) To have yourcast search for a good value based on a target value of the derivative of $E(Y)$ with respect to age, set to a vector of elements containing the start and end of a range in sigma in which to look (such as 0.05 and 1.5), the number of values to look at within this range (such as 5), and the target value of the derivative of $E(Y)$ with respect to age (such as 0.05). The vector may also include a fifth element, which is the target value of the total standard deviation of $E(Y)$ over all dimensions of the prior (such as 0.1). (You may choose to run yourcast with model=ebayes on a related data set to find an approximate target value of the derivative and standard deviation automatically.) Default: 0.30.
Ha.sigma.sd	A scalar; the standard deviation of parameter Ha.sigma (for Gibbs sampling only). Default: 0.1.
Ha.deriv	A numeric vector, each element of which is n , the degree of a (discrete) derivative of the smoothness functional with respect to the age group. Element k of this vector refers to the $(k - 1)$ th derivative, where 0 excludes the derivative, 1 includes it, and values in between include the derivative but weight it down proportionally. The first element of the vector corresponds to the weight on the derivative with respect to age of order 0 (the identity operator), the second to

the weight on the derivative of order 1 (the 1st derivative), etc. For example, $c(0, 1, 1)$ corresponds to a mixed functional that penalizes the first and second derivatives equally. The higher the order of derivative, the more local smoothness over age groups; and lowest specified derivative controls the form of prior indifference. Default: $c(\emptyset, \emptyset, 1)$, which usually works well.

- Ha.age.weight** A scalar or a numeric vector with weights that determine how much smoothing occurs for different age groups. If set to 0 or NA, age groups are weighted equally; if set to a nonzero scalar, the weight for age group a is set proportional to a^H *a.age.weight*; if a vector of length A, the a th element is the weight of age group a . Default: \emptyset .
- Ha.time.weight** A scalar or a numeric vector with weights that determine how much smoothing occurs for different time periods when smoothing over age groups. If \emptyset or NA, time periods are weighted equally; if set to a nonzero scalar value, the weight for time period t in smoothing age groups is proportional to t^H *a.time.weight*; if the argument is a vector of length T, the t th element is the weight of time period t . Default: \emptyset .
- Ht.sigma** This can be set in one of three ways: (1) a scalar which sets σ_t , the prior standard deviation of $E(Y)$, indicating how much to smooth $E(Y)$ over time periods (which may vary over geographic areas and age groups, and with the standard deviations averaged over time periods). A larger standard deviation represents more prior uncertainty, which allows the data to play a greater role. (2) NA to not smooth in this way. (3) To have [yourcast](#) search for a good value based on a target value of the derivative of $E(Y)$ with respect to time, set to a vector of elements containing the start and end of a range in sigma in which to look (such as 0.05 and 1.5), the number of values to look at within this range (such as 5), and the target value of the derivative of $E(Y)$ with respect to time (such as 0.05). The vector may also include a fifth element, which is the target value of the total standard deviation of $E(Y)$ over all dimensions of the prior (such as 0.1). (You may choose to run [yourcast](#) with `model=ebayes` on a related data set to find an approximate target value of the derivative and standard deviation automatically.) Default: $\emptyset.3\emptyset$.
- Ht.sigma.sd** A scalar; the standard deviation of parameter **Ht.sigma** (for Gibbs sampling only). Default: $\emptyset.1$.
- Ht.deriv** A numeric vector, each element of which is n , the degree of a (discrete) derivative of the smoothness functional with respect to time. Element k of this vector refers to the $(k - 1)$ th derivative, where 0 excludes the derivative, 1 includes it, and values in between include the derivative but weight it down proportionally. The first element of the vector corresponds to the weight on the derivative with respect to time of order 0 (the identity operator), the second to the weight on the derivative of order 1 (the 1st derivative), etc. For example, $c(\emptyset, 1, 1)$ corresponds to a mixed functional that penalizes the first and second derivatives equally. The higher the order of derivative, the more local smoothness over time; and lowest specified derivative controls the form of prior indifference. Default: $c(\emptyset, \emptyset, 1)$, which usually works well.
- Ht.age.weight** A scalar or a numeric vector with weights that determine how much smoothing occurs for different age groups when smoothing over time. If set to \emptyset or NA, age groups are weighted equally in smoothing over time; if set to a nonzero scalar,

	the weight for age group a is set proportional to $a^H t.age.weight$; if a vector of length A , the ath element is the weight of age group a . Default: 0.
Ht.time.weight	A scalar or a numeric vector with weights that determine how much smoothing occurs for different time periods when smoothing over time. If \emptyset or NA, time periods are weighted equally; if set to a nonzero scalar value, the weight for time period t in smoothing time periods is proportional to $t^H t.time.weight$; if the argument is a vector of length T , the tth element is the weight of time period t . Default: 0.
Hat.sigma	This can be set in one of three ways: (1) a scalar which sets σ_{at} , the prior standard deviation of $E(Y)$, indicating how much to smooth the time trend in $E(Y)$ over age groups. A larger standard deviation represents more prior uncertainty, which allows the data to play a greater role. (2) NA to not smooth in this way. (3) To have <code>yourcast</code> search for a good value based on a target value of the derivative of $E(Y)$ with respect to age and time, set to a vector of elements containing the start and end of a range in sigma in which to look (such as 0.05 and 1.5), the number of values to look at within this range (such as 5), and the target value of the derivative of $E(Y)$ with respect to age and time (such as 0.05). The vector may also include a fifth element, which is the target value of the total standard deviation of $E(Y)$ over all dimensions of the prior (such as 0.1). (You may choose to run <code>yourcast</code> with <code>model=ebayes</code> on a related data set to find an approximate target value of the derivative and standard deviation automatically.) Default: $\emptyset.2$.
Hat.sigma.sd	A scalar; the standard deviation of parameter <code>Hat.sigma</code> (for Gibbs sampling only). Default: $\emptyset.1$.
Hat.a.deriv	A numeric vector, each element of which is n , the degree of a (discrete) derivative of the smoothness functional of time trends with respect to age groups. Element k of this vector refers to the $(k - 1)$ th derivative of the time trend v with respect to age, where 0 excludes the derivative, 1 includes it, and values in between include the derivative but weight it down proportionally. The first element of the vector corresponds to the weight on the derivative of the time trend with respect to age of order 0 (the identity operator), the second to the weight on the derivative of order 1 (the 1st derivative), etc. For example, $c(\emptyset, 1, 1)$ corresponds to a mixed functional that penalizes the first and second derivatives equally. The higher the order of derivative, the more local smoothness over time; and lowest specified derivative controls the form of prior indifference. Default: $c(\emptyset, \emptyset, 1)$, which usually works well.
Hat.t.deriv	A numeric vector, each element of which is n , the degree of a (discrete) derivative of the smoothness functional of age derivative with respect to time. Element k of this vector refers to the $(k - 1)$ th derivative of the age derivative with respect to time, where 0 excludes the derivative, 1 includes it, and values in between include the derivative but weight it down proportionally. The first element of the vector corresponds to the weight on the age derivative with respect to time of order 0 (the identity operator), the second to the weight on the derivative of order 1 (the 1st derivative), etc. For example, $c(\emptyset, 1, 1)$ corresponds to a mixed functional that penalizes the first and second derivatives equally. The higher the order of derivative, the more local smoothness over time; and lowest specified derivative controls the form of prior indifference. Default: $c(\emptyset, \emptyset, 1)$, which usually works well.

Hat.age.weight	A scalar or a numeric vector with weights that determines how much smoothing occurs for different age groups when smoothing over age and time. If set to 0 or NA, age groups are weighted equally in smoothing over time; if set to a nonzero scalar, the weight for age group a is set proportional to $a^H t.age.weight$; if a vector of length A, the a th element is the weight of age group a . Default: 0.
Hat.time.weight	A scalar or a numeric vector with weights that determine how much smoothing occurs for different time periods when smoothing over age and time. If 0 or NA, time periods are weighted equally; if set to a nonzero scalar value, the weight for time period t in smoothing time periods is proportional to $t^H t.time.weight$; if the argument is a vector of length T, the t th element is the weight of time period t . Default: 0.
Hct.sigma	A scalar which sets σ_t , the prior standard deviation of $E(Y)$, which indicates how to smooth $E(Y)$ over geographic areas, or NA to not smooth in this way. The parameter $\sigma_c t$ is the expected prior standard deviation of $E(Y)$ for a geographic area (varying over time periods and age groups, and with the standard deviations averaged over geographic areas). (A larger standard deviation represents more prior uncertainty, which allows the data to play a greater role.) Default: 0.3.
Hct.sigma.sd	A scalar; the standard deviation of parameter Ht.sigma (for Gibbs sampling only). Default: 0.1.
Hct.t.deriv	A numeric vector; controls whether smoothing the level or the time trend of $E(Y)$ over geographic areas (both cannot presently be done simultaneously). To smooth the level of $E(Y)$ over geographic areas, set to 1, the identity. To smooth the time trend, set this (as in Hat.t.deriv) to the weight of the partial derivative taken with respect to time in the standard smoothness functional for the prior. The use of the first or higher order partial derivatives are supported. Default: 1.
Hct.time.weight	A scalar or a numeric vector with weights that determine how much smoothing occurs for different time periods when smoothing over geographic areas. If 0 or NA, time periods are weighted equally; if set to a nonzero scalar value, the weight for time period t in smoothing over areas is proportional to $t^H ct.time.weight$; if the argument is a vector of length T, the t th element is the weight of time period t . Default: 0.
LI.sigma.mean	A scalar; used in the likelihood and in the calculation of the priors in conjunction with Ha.sigma.sd, Hat.sigma.sd, Ht.sigma.sd, and Hct.sigma.sd. Default: 0.2.
LI.sigma.sd	A scalar; the standard deviation of LI.sigma.mean used in the calculation of the priors. Default: 0.1.
nsample	A scalar; represents the number of iterations in the Gibbs algorithm bayes. Default: 500.
low.pow	Boolean. Whether to include lower-power of explanatory variables in the simulation as derived from formula. For example $y \sim x^4$, if low.pow = TRUE, then x, x^2, x^3, x^4 will be included. Default: TRUE.
verbose	Boolean. Suppress verbose output. Default: FALSE

Value

Returns a list of class ‘yourcast’ containing the following components:

call	The full call, including all command line options when yourcast was called.
userfile	The full userfile if it was specified.
yhat	A list with the same cross-sectional elements as the input data, but with two columns: ‘y’ for the observed dependent variable and ‘yhat’ for the predicted values. These include both in-sample and out-of-sample values, as distinguished by the values of <code>sample.frame</code> .
coeff	A list with the same cross-sectional elements as the input data, elements of which are the estimated coefficients if calculated by the chosen model.
sigma	A list with the same cross-sectional elements as the input data, elements of which are the estimated standard error of the estimate of the regression (the standard deviation of the dependent variable given the explanatory variables).
aux	List. A list of summary information about the yourcast analysis used by <code>plot.yourcast</code>
params	Vector. Smoothing parameters used in model.

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References

<http://gking.harvard.edu/yourcast>

yourprep

Data object creation wizard for YourCast

Description

Builds the data object for `yourcast` function from files in working directory or other specified directory and checks for errors

Usage

```
yourprep(dpath=getwd(), tag="csid", index.code="gggaa",
        datalist=NULL, G.names=NULL, A.names=NULL,
        T.names=NULL, proximity=NULL, year.var=FALSE,
        sample.frame=NULL, summary=FALSE, verbose=FALSE,

        #lagging utility
        lag=NULL, formula=NULL, vars.nolag=NULL)
```


Arguments

<code>dpath</code>	String. Name of the directory where data files are stored. If NULL then defaults to working directory. Default: NULL
<code>tag</code>	String. Group of characters placed before CSID code in filenames to indicate which files in <code>dpath</code> function should load. The <code>tag</code> can also be used to differentiate between different groups to be considered in separate analysis; for example, 'm' for male deaths and 'f' for female deaths. Default: "csid"
<code>index.code</code>	String indicating how the CSID index variable is coded in the input data. Between 0 and 4 of the following two characters are used in this order: g for the geographic index (such as country) and a for a grouped continuous variable like an age group. For example, ggggaa would have the function interpret '245045' by using '2450' as the country code and '45' as the age group. Default: "ggggaa"
<code>datalist</code>	A list of cross section dataframes already loaded into the workspace to be added to the <code>dataobj</code> . Names of list elements should be the numerical CSID code for each cross section, and dataframes should be formatted identically to files loaded from an external directory (see Details)
<code>A.names</code> , <code>G.names</code> , <code>T.names</code>	String. Filename of optional two-column data files that list all valid numerical codes (in the first column) and corresponding alphanumeric names (optionally in the second column) for the indices corresponding to geographic areas in <code>G.names</code> , age groups in <code>A.names</code> , and time periods in <code>T.names</code> . Function will search <code>dpath</code> for file with specified name; please include column labels. The optional alphanumeric identifiers are most commonly only used for geographic areas since numerical values for age groups and time periods are usually meaningful on their own. However, if other grouped continuous variable used in place of ages, for example, specifying these labels will be important for output to be meaningful. NOTE: Auxiliary files will loaded automatically by <code>yourprep()</code> if they are saved in the <code>dpath</code> and labeled with the <code>tag</code> specified by the user. See 'Details' section for more information. Default: NULL
<code>proximity</code>	Data file with codes to construct the symmetric matrix (geographic region by geographic region) of proximity scores for geographic smoothing used by the 'map' and 'bayes' methods. The larger the relative score, the more proximate that pair of countries is in the prior; a zero element means the two geographic areas are unrelated (the diagonal is ignored). Each row of the <code>proximity</code> file has three columns, consisting of geographic codes for two countries and a score indicating the proximity or similarity of the two geographic regions; please include column labels. For convenience, geographic regions that are unrelated (and would have zero entries in the symmetric matrix) may be omitted from <code>proximity</code> . In addition, <code>proximity</code> may include rows corresponding to geographic regions not included in the present analysis. Default: NULL
<code>year.var</code>	Boolean. Should be TRUE if year coded as separate variable rather than as rowname for cross section data files. Function will look for year variable to use as rownames and then drop it from the dataframe. Change will only be made to dataframe if it does not already have rownames or if existing rownames are merely a '1...N' index of row numbers, so it is possible to apply correction even if some cross sections do not have a year variable and already have the correct rownames. Default: FALSE

<code>sample.frame</code>	Optional four element vector containing, in order, the start and end time periods to be used for the observed data and the start and end time periods to be forecast. All cross sections do not have to begin at starting date, but must contain all years after the first observed value. Variables to be forecasted should be coded as NA in the out-of-sample period. Note that this makes it easy to reserve a range of values of the dependent variable for out-of-sample forecasting evaluation; our <code>summary</code> and <code>plot</code> functions in <code>yourcast</code> will make these comparisons automatically if the out-of-sample data are included. <code>yourprep()</code> uses this information only to verify that cross sections are correctly constructed, but it should also be included if one wants to use the lag utility. Default: NULL
<code>summary</code>	Boolean. If TRUE, means for available observations on each variable are displayed for the cross sections read by <code>yourprep()</code> . Default: FALSE
<code>verbose</code>	Boolean. If TRUE, function prints name of each cross section or auxiliary file as it is read into the <code>dataobj</code> . Default: FALSE
<code>lag</code>	Number of years covariate data needs to be lagged from current position in cross section files. See ‘Details’ for more information. Default: NULL
<code>formula</code>	Formula. The formula that one will use in the subsequent run of <code>yourcast()</code> . This helps the lagging utility distinguish between the response variable (which will not be shifted between cross sections) and the covariates of interest that should be lagged and included in the final cross sections of the <code>dataobj</code> . If the covariate ‘index’ is included in the formula, the lagging utility will include a variable in the cross sections that starts from 1 and counts the number of time periods since the start of the cross section. If a lag is requested, the formula argument must be specified. Default: NULL
<code>vars.nolag</code>	Vector of strings. Vector of variables to be included in the <code>dataobj</code> but not lagged. These variables do not need to be included in the formula, and if found there will not be ignored when the other covariates are lagged.

Details

Creates `dataobj` input for `yourcast` from files in working directory or other specified directory. Checks that all cross sections in data list titled properly and if all years up to last predicted year included in the dataframes (if `sample.frame` argument specified). Please note, however, that all cross sections from the same geographic area must have the same observation and prediction years in the dataframe (even if NA) for the graphing software `plot.yourcast` to work.

The cross section files must be named according to the CSID identifiers for country code and age group, preceeded by the specified tag (default: "csid") so that `yourprep()` can identify the file from other files in the `dpath`. For example, for the USA (country code 2450) time series of 45 year old individuals, the file name should be ‘csid245045.txt’ if the tag is left as the default. Files must have an extension so that the program can recognize how the data is coded. Currently, fixed width text files (‘*.txt’), comma-separated values (‘*.csv’), and Stata v.5-10 (‘*.dta’) files are supported, and multiple file types may be used in the same run of the program. ‘*.Rdata’ objects can be included with the `datalist` option after they are loaded to a list in the workspace. `yourprep()` includes diagnostics to ensure that objects are properly named and not included accidentally, but users should examine the specified `dpath` before running `yourprep()` to minimize errors.

Each cross section file should be labeled columns of time-series data for the dependent variable(s) (e.g., disease, pop) and the covariates that will be used in the forecast. The rownames for the

dataframe should be the observation year (if the year is coded as a separate variable, set `year.var=TRUE`). The files must contain the full time series that will be specified in the `sample.frame` argument in `yourcast` after the first observed year. For instance, if `sample.frame=c(1950,2000,2001,2030)`, then files would have observations that start between 1950 and 2000 and include all other years (even if the entries are NA) up to the last year of prediction, i.e., 2030.

Optional auxiliary files such as `G.names` should be named according to the filename specified in the respective arguments. If specified, these files must have extensions and be coded in one of the three supported file types. However, these files will be automatically loaded by `yourprep()` if they are saved in the `dpath` and labeled with the tag specified by the user. The default names for these files must be used (e.g., `'G.names'` and `'proximity'`). For example, if the `tag` is left as the default and there is a file in the `dpath` labeled `'csid.G.names.txt'`, `yourprep()` will load this automatically and save the input as the `G.names` element of the `'dataobj'` list. `yourprep()` arguments such as `G.names` take precedence over `'TAG.*'` files in `thedpath`.

`yourprep()` also includes a lagging utility (activated once one specifies a lag length with the `'lag'` argument). This utility is useful for when the data in each cross section is, for example, the response and covariates for 50 year olds in each year but the desired content for each cross section is the response for 50 year olds and the covariates for 25 year olds 25 years prior to each year (implying a lag of 25 years). In order to have `yourprep()` perform this lagging automatically, include cross sections for each age group with data starting the same number of years before the first observation year as the requested lag period. Thus if `lag=25` and the first observation year is 1950, then the cross sections should all start at 1925. Age groups younger than the length of the lag will not retain covariate data (except perhaps an `'index'` variable) in the output object. The covariates lagged are the predictor variables specified in the `formula` argument.

If data for a cohort 25 years (in this case) younger is not available for some cohort over age 25, `yourprep()` will look for the closest cohort available and issue a warning message.

Value

`dataobj` A list with several components:

- data** A list with the cross-sectional data matrices as elements.
- proximity** A three-column matrix of proximity scores for geographic smoothing used by the `'map'` and `'bayes'` methods. For each row, the first two columns indicate the country pair. The third column indicates the proximity score. The larger each score, the more proximate that pair of countries is in the prior; a zero element means the two geographic areas are unrelated (the diagonal is ignored).
- G.names, A.names, T.names** Optional two-column dataframes that list all valid numerical codes (in the first column, labeled codes) and corresponding alphanumeric names (optionally in the second column, labeled name) for the indices corresponding to the geographic areas in `G.names`, age groups in `A.names`, and time periods in `T.names`.
- index.code** A string indicating how the index variable is coded in the input data.

Author(s)

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References

<http://gking.harvard.edu/yourcast>

See Also

[yourcast](#) function and documentation (`help(yourcast)`)

Examples

```
## Not run:
# Working directory automatically set to directory with cross
# section and auxiliary files to begin. Files for this example
# in 'data' folder of YourCast library.

#Old working directory to be restored later
oldwd <- getwd()
# Now setting wd to 'data' folder in YourCast library
setwd(system.file("data", package="YourCast"))

# Simple run of the function, using option that turns year variable
# into label in each cs. Use sample.frame argument for all diagnostics
# to work

dta <- yourprep(G.names="centry.codes.txt", proximity="proximity.txt",
year.var=TRUE, verbose=TRUE, sample.frame=c(1950, 2000, 2001, 2030))

# With summary output (means of variables in each cross section)

dta <- yourprep(G.names="centry.codes.txt", proximity="proximity.txt",
year.var=TRUE, summary=TRUE)

# Function can also add datafiles already loaded into R as objects in
# the workspace with "datalist" option if put into a list and properly
# labeled. All diagnostics still performed
# 'csid204545', etc., are dataframes in workspace

# Labels changed to nonsense ones so as not to confuse with other files

data(csid204545)
data(csid204550)
data(csid204555)

datalist <- list("123456"=csid204545, "234567"=csid204550,
"345678"=csid204555)

# Verbose option turned on and datalist argument added

dta <- yourprep(G.names="centry.codes.txt", proximity="proximity.txt",
year.var=TRUE, verbose=TRUE, datalist=datalist)
```

```
# Setting working directory back
setwd(oldwd)
rm(oldwd)

## End(Not run)
```

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