Package 'BaM'

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Title Functions and Datasets for ``Bayesian Methods: A Social and
Behavioral Sciences Approach''

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Author Jonathan Homola, Danielle Korman, Jacob Metz, Miguel Pereira, Mauri-
cio Vela, and Jeff Gill <jgill5402@mac.com>

Maintainer Jeff Gill <jgill5402@mac.com>

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R topics documented:

---

actuarial	*actuarial*

Description

actuarial claims data for three groups of insurance policyholders p. 449

Usage

```
data(actuarial)
```

Format

dataset with 5 observations of 7 variables

Details

The variables included in the dataset are:

- year
- payroll for groups 1, 2, and 3
- claims for groups 1, 2, and 3

Source

Scollnik, D. P. M. (2001). Actuarial Modeling with MCMC and BUGS. North American Actuarial Journal 5, 95-124.

---

adam.jags	*adam.jags*

Description

data from Differences in the Validity of Self-Reported Drug Use Across Five Factors in Indianapolis, Fort Lauderdale, Phoenix, and Dallas, 1994 (ICPSR Study Number 2706, Rosay and Herz (2000), from the Arrestee Drug Abuse Monitoring (ADAM) Program/Drug Use Forecasting, ICPSR Study Number 2826. The original purpose of the study was to understand the accuracy of self-reported drug use, which is a difficult problem for obvious reasons.

The variables included in the dataset are:

- AGEGRP 1 for 1,700 cases 18 through 30 years old, 2 for 1,265 cases 31 years old or over
- CASES
- CATS
- COCSELF indicating self-reported cocaine usage prior to arrest (0 for 2,220 negative responses, 1 for 745 positive responses)

- COCTEST
- COVARS
- GROUP
- ID
- MJSELF
- MJTEST a dichotomous variable indicating a positive urine test for marijuan
- OFFENSE
- RACE 1 for 1,554 black cases, 2 for 1,411 white cases
- SEX 1 for 2,213 male cases, 2 for 752 female cases
- SITE coded according to: Indianapolis = 1 (759 cases), Ft. Lauderdale = 2 (974 cases),Phoenix = 3 (646 cases), and Dallas = 4 (586 cases)

Usage

    data(adam.jags)

---

    afghan.deaths   *afghan.deaths*

Description

NATO Fatalities in Afghanistan, 10/01 to 1/07. see page 350

Usage

    data(afghan.deaths)

Format

52 monthly periods, listed by rows

---

    africa   *africa*

Description

African Coups Data, pp.562-564

Usage

    data(africa)

Format

data frame with 33 observations of different African countries' military coups with 7 explanatory variables

Details

The variables included in the dataset are:

- `MILTCOUP` Military Coups
- `MILITARY` Military Oligarchy
- `POLLIB` Political Liberalization: 0 for no observable civil rights for political expression, 1 for limited, and 2 for extensive
- `PARTY93` number of legally registered political parties
- `PCTVOTE` Percent Legislative Voting
- `PCTTURN` Percent registered voting
- `SIZE` in one thousand square kilometer units
- `POP` Population in millions
- `NUMREGIM` Regime
- `NUMELEC` Election

Source

Bratton, M. and Van De Walle, N. (1994). Neopatrimonial Regimes and Political Transitions in Africa. World Politics 46, 453-489.

---

asap.data.list *asap.data.list*

Description

The American State Administrator's Project (ASAP) survey asks administrators about the influence of a variety of external political actors including "clientele groups" in their agencies., see page 395.

The variables included in the dataset are:

- `contracting` scale from 0 : 6 where higher indicates more private contracting within the respondent's agency.
- `gov.incluence` respondents' assessment of the governor's influence on contracting in their agency.
- `leg.influence` respondents' assessment of the legislatures' influence on contracting in their agency, ranging from 0 : 21.
- `elect.board` dichotomous variable coded 1 if appointed by a board, a commission or elected, and 0 otherwise.
- `years.tenure` number of years that the respondent has worked at their current agency.

- education ordinal variable for level of education possessed by the respondent.
- partisan.ID a 5-point ordinal variable (1-5) for the respondent's partisanship (strong Democrat to strong Republican).
- category categories of agency type.
- med.time whether the respondent spent more or less than the sample median with representatives of interest groups.
- medt.contr interaction variable between med.time and contracting.
- gov.ideology state government ideology from Berry et al. (1998) from 0 to 100.
- lobbyists total state lobbying registrants in 2000-01 from Gray and Lowery (1996, 2001).
- nonprofits provides the total number of nonprofit groups in the respondents' state in the year 2008, divided by 10,000.

Usage

```
data(asap.data.list)
```

---

baldus   *Baldus Dataset*

Description

Data from Baldus Study on death sentences in Georgia (Exercise 14.2, p. 521). To use the data in JAGS or WinBugs, see baldus.jags and balfus.winbugs, respectively.

Usage

```
data(baldus)
```

Details

The variables included in the dataset are:

- race Defendant's race (1 = Black)
- educatn Educational level
- employm Employment status (1 = Employed)
- SES Socioeconomic status (1 = Low Wage)
- married Marital status (1 = Married)
- num.chld Number of children
- military Military experience (1 = Serving, 0 = No military service, -1 = Dishonorable Discharge)
- pr.arrst
- plea Plea to Murder Indictment
- sentence Sentenced

- `defense` Status of Principle Defense Council (1 = Retained, 2 = Appointed)
- `dp.sght` Prosecutor Waive/Fail to Seek DP (1 = Failed/Unknown, 2 = Sought DP)
- `jdge.dec` Judge Took Sentence from Jury?
- `pen.phse` Was there a penalty trial?
- `did.appl` Did defendant appeal cov. or sentence?
- `out.appl` Outcome of appeal
- `vict.sex` Victim sex
- `pr.incrc`
- `vict.age` Victim's age
- `vict.rel` Relation of victim with defendant
- `vict.st1` Victim status (0 = Non-police+judicial, 1 = Police+judicial)
- `vict.st2`
- `specialA` Special Circumstances ()
- `methodA` Method of killing
- `num.kill` Number of persons killed by defendant
- `num.prps` Number of persons killed by coperpetrator
- `def.age` Defendant's age
- `aggrevat` Aggravating circumstances
- `bloody` Bloody crime
- `fam.lov`
- `insane` Defendant invoked insanity defense
- `mitcir`
- `num.depr`
- `rape` Rape involved

Source

Baldus, D. C., Pulaski, C., & Woodworth, G. (1983). Comparative review of death sentences: An empirical study of the Georgia experience. The Journal of Criminal Law and Criminology (1973-), 74(3), 661-753.

See Also

baldus.jags baldus.winbugs

---

bcp   *bcp*

Description

Implementation of bcp function, see pages 362-363 (2nd Edition).

Usage

```
bcp(theta.matrix, y, a, b, g, d)
```

Arguments

theta.matrix	theta.matrix
y	Counts of Coal Mining Disasters
a	Alpha Value in the lambda Prior
b	Beta Value in the lambda Prior
g	Gamma Value in the phi Prior
d	Delta Value in the phi Prior

Author(s)

Jeff Gill

Examples

```
## Not run:
bcp(theta.matrix,y,a,b,g,d)

## End(Not run)
```

---

biv.norm.post   *biv.norm.post*

Description

A function to calculate posterior quantities of the bivariate normal. See page 94.

Usage

```
biv.norm.post(data.mat,alpha,beta,m,n0=5)
```

Arguments

`data.mat`	A matrix with two columns of normally distributed data
`alpha`	Wishart first (scalar) parameter
`beta`	Wishart second (matrix) parameter
`m`	prior mean for mu
`n0`	prior confidence parameter

Value

Returns

`mu2`	posterior mean, dimension 1
`sig1`	posterior mean, dimension 2
`sig2`	posterior variance, dimension 1
`rho`	posterior variance, dimension 2

Author(s)

Jeff Gill

Examples

```
rwishart <- function(df, p = nrow(SqrtSigma), SqrtSigma = diag(p))  {
if((Ident <- missing(SqrtSigma)) && missing(p)) stop("either p or SqrtSigma must be specified")
Z <- matrix(0, p, p)
diag(Z) <- sqrt(rchisq(p, df:(df-p+1)))
if(p > 1) {
  pseq <- 1:(p-1)
  Z[rep(p*pseq, pseq) + unlist(lapply(pseq, seq))] <- rnorm(p*(p-1)/2)
}
if(Ident) crossprod(Z)
else crossprod(Z %*% SqrtSigma)
}

 data.n10 <- rmultinorm(10, c(1,3), matrix(c(1.0,0.7,0.7,3.0),2,2))
 rep.mat <- NULL; reps <- 1000
 for (i in 1:reps){
  rep.mat <- rbind(rep.mat, biv.norm.post(data.n10,3, matrix(c(10,5,5,10),2,2),c(2,2)))
 }
 round(normal.posterior.summary(rep.mat),3)
```

---

cabinet.duration	*cabinet.duration*

Description

Cabinet duration (constitutional inter-election period) for eleven Western European countries from 1945 to 1980, page 65

Usage

```
cabinet.duration
```

Format

cabinet duration of 11 countries

Details

The variables included in the dataset are:

- N number of cabinets
- dur average length of duration

Note

Row names indicate country.

References

Browne, E. C., Frendreis, J. P., and Gleiber, D. W. (1986). The Process of Cabinet Dissolution: An Exponential Model of Duration and Stability in Western Democracies. American Journal of Political Science 30, 628-650.

---

child	*child*

Description

Child Support Collection Policies from 50 states from 1982-1991. See page 166

Usage

```
child
```

Format

observations of 8 variables for 50 states

Details

The variables included in the dataset are:

- `SCCOLL` Change in Child Support collections
- `ACES` Chapters per Population
- `INSTABIL` Policy Instability
- `AAMBIG` Policy Ambiguity
- `CSTAFF` Change in Agency Staffing
- `ARD` State Divorce Rate
- `ASLACK` Organizational Slack
- `AEXPEND` State Level Expenditures

Source

Meier, K.J. and Keisler, L.R. (1996). Public Administration as a Science of the Artificial: A Method for Prescription, Public Administration Review 56, 459-466.

---

china.wars	*china.wars*

Description

Modeling code for the example of ancient Chinese wars. See page 163-165

Usage

```
china.wars()
```

Author(s)

Jeff Gill

Source

Claudio Cioffi-Revilla and David Lai, 2001,
"Chinese Warfare and Politics in the Ancient East Asian International System",
Download from <doi:10.1080/03050620108434971>
Henry A. Murray Research Archive
Center for International Relations, Department of Political Science, University of Colorado, Boulder, USA

---

coal.mining.disasters   *coal.mining.disasters*

Description

A vector of British Coal Mining Disasters, see page 549-550

Usage

```
coal.mining.disasters
```

Format

vector of length 111

Source

Lynn, R. and Vanhanen, T. (2001). National IQ and Economic Development. Mankind Quarterly LXI, 415-437.

---

contracep   *contracep*

Description

Contraception Data by country. See page 446

Usage

```
data(contracep)
```

Format

4 variables for 15 countries

Details

The variables included in the dataset are:

- Country Developing countries by size
- URC Rural Childhood
- WED Years of Education for the Woman
- FPE Exposure to Family Planning Efforts
- WED.FPE Interaction term specified by Wong and Mason

Source

Wong, G. Y. and Mason, W. M. (1985). The Hierarchical Logistic Regression Model for Multilevel Analysis. Journal of the American Statistical Association 80, 513-524.

DA_cwp   *DA_cwp*

Description

Data on ancient Chinese wars

Details

The variables included in the dataset are:

- X1
- CHLEG010
- LEGHUANG
- X.2697
- X.2697.1
- X2
- X1.1
- X1.2
- X0
- X0.1
- X2.1
- X3
- X2.2
- X3.1
- X2.3

---

dmultinorm   *dmultinorm*

Description

dmultinorm function, see page 376.

Usage

```
dmultinorm(xval,yval,mu.vector,sigma.matrix)
```

Arguments

xval	Vector of X Random Variables
yval	Vector of Y Random Variables
mu.vector	Mean Vector
sigma.matrix	Matrix of Standard Deviations

Author(s)

Jeff Gill

---

dp   *dp*

Description

Death Penalty Data, See Page 142.

Usage

```
data(dp)
```

Format

7 variables for 17 states

Details

The variables included in the dataset are:

- `X` State

- `EXECUTIONS` Number of capital punishments at state level in 1997

- `INCOME` Median per capita income in dollars

- `PERPOVERTY` Percent classified as living in poverty

- `PERBLACK` Percent of black citizens in population

- `VC100k96` Rate of violent crime per 100,000 residents for 1996

- `SOUTH` Is the state in the South?

- `PROPDEGREE` Proportion of population with college degree

Source

Norrander, B. (2000). The Multi-Layered Impact of Public Opinion on Capital Punishment Implementation in the American States. Political Research Quarterly 53, 771-793.

`durations.hpd`	*durations.hpd*

Description

Simple HPD calculator from Chapter 2 (page 51, 2nd Edition).

Usage

```
durations.hpd(support,fn.eval,start,stop,target=0.90,tol=0.01)
```

Arguments

support	x-axis values
fn.eval	function values at x-axis points
start	starting point in the vectors
stop	stoppng point in the vectors
target	Desired X Level
tol	Tolerance for round-off

Author(s)

Jeff Gill

Examples

```
## Not run:
  get("cabinet.duration")
  ruler <- seq(0.45,0.75,length=10000)
  g.vals <- round(dgamma(ruler,shape=sum(cabinet.duration$N),
                   rate=sum(cabinet.duration$N*cabinet.duration$dur)),2)
  start.point  <- 1000; stop.point <- length(g.vals)
  durations.hpd(ruler,g.vals,start.point,stop.point)

## End(Not run)
```

---

  elicspend   *elicspend*

Description

Eliciting expected campaign spending data. Eight campaign experts are queried for quantiles at levels m = [0.1, 0.5, 0.9], and they provide the following values reflecting the national range of expected total intake by Senate candidates (in thousands). See page 120

Usage

```
data(elicspend)
```

---

  ethnic.immigration   *ethnic.immigration*

Description

1990-1993 W.Europe Ethnic/Minority Populations. see page 280.

Usage

```
data(ethnic.immigration)
```

Format

total number of ethnic immigrants living in Western Europe from 22 countries

Details

The variables included in the dataset are:

- Country.of.Origin Country of origin of immigrants
- Estimated.Total.K. Estimated total ethnic minority population in Western European Countries
- Percent.of.Total Percent of Total

Source

Peach, C. (1997). Postwar Migration to Europe: Reflux, Influx, Refuge. Social Science Quarterly 78, 269-283.

---

executions   *executions*

Description

Execution data.

The variables included in the dataset are:

- State State
- EXECUTIONS Number of capital punishments at state level in 1997
- Median.Income Median per capita income in dollars
- Percent.Poverty Percent classified as living in poverty
- Percent.Black Percent of black citizens in population
- Violent.Crime Rate of violent crime per 100,000 residents for 1996

Usage

    data(executions)

Format

explanatory variables for 17 states

---

experts   *Campaign fundraisign elicitations*

Description

Fabricated data on campaign fundraising elicitations. See page 120

Usage

    experts(q1,q2,q3)

Arguments

q1	the 0.1 quantile
q2	the 0.5 quantile
q3	the 0.9 quantile

---

expo.gibbs   *expo.gibbs*

Description

Simple Gibbs sampler demonstration on conditional exponentials from Chapter 1 (pages 25-27).

Usage

```
expo.gibbs(B,k,m)
```

Arguments

B	an upper bound
k	length of the subchains
m	number of iterations

Author(s)

Jeff Gill

---

expo.metrop   *expo.metrop*

Description

Simple Metropolis algorithm demonstration using a bivariate exponential target from Chapter 1 (pages 27-30).

Usage

```
expo.metrop(m,x,y,L1,L2,L,B)
```

Arguments

m	number of iterations
x	starting point for the x vector
y	starting point for the y vector
L1	event intensity for the x dimension
L2	event intensity for the y dimension
L	shared event intensity
B	upper bound

Author(s)

Jeff Gill

Examples

```
expo.metrop(m=5000, x=0.5, y=0.5, L1=0.5, L2=0.1, L=0.01, B=8)
```

---

fdr   *fdr*

Description

FDR election data. See page 576

The variables included in the dataset are:

- State State name
- FDR Whether or not FDR won the state in 1932 election, 1 = won, 0 = lost
- PRE.DEP Mean income per state before the Great Depression (1929), in dollars
- POST.DEP Mean income per state after the Great Depression (1932), in dollars
- FARM Total farm wage and salary disbursements in thousands of dollars per state in 1932

Usage

```
data(fdr)
```

---

hanjack   *hanjack*

Description

1964 presidential election data. See page 221

Usage

```
hanjack(N,F,L,W,K,IND,DEM,WR,WD,SD)
```

Arguments

N	number of cases in the group
F	Observed cell proportion voting for Johnson
L	log-ratio of this proportion, see p. 246
W	collects the inverse of the diagonal of the matrix for the group-weighting from $[N\_iP\_i(1-P\_i)]$
K	constant
IND	indifference to the election
DEM	stated preference for Democratic party issues
WR	Weak Republican
WD	Weak Democrat
SD	Strong Democrat

References

Hanushek, E. A. and Jackson, J. E. (1977). Statistical Methods for Social Scientists San Diego, Academic Press

---

hit.run	*hit.run*

Description

Implementation of hit.run algorithm, p. 361.

Usage

```
hit.run(theta.mat,reps,I.mat)
```

Arguments

theta.mat	theta.mat
reps	reps
I.mat	I.mat

Author(s)

Jeff Gill

Examples

```
## Not run:
#code to implement graph on p. 362, see page 376.

num.sims <- 10000
Sig.mat <- matrix(c(1.0,0.95,0.95,1.0),2,2)
walks<-rbind(c(-3,-3),matrix(NA,nrow=(num.sims-1),ncol=2))
walks <- hit.run(walks,num.sims,Sig.mat)
z.grid <- outer(seq(-3,3,length=100),seq(-3,3,length=100),
                FUN=dmultinorm,c(0,0),Sig.mat)
contour(seq(-3,3,length=100),seq(-3,3,length=100),z.grid,
        levels=c(0.05,0.1,0.2))
points(walks[5001:num.sims,],pch=".")
```

---

iq *iq data frame*

Description

IQ data for 80 countries. See pages 85-87

Usage

```
data(iq)
```

Source

Lynn, R. and Vanhanen, T. (2001). National IQ and Economic Development. Mankind Quarterly LXI, 415-437.

Examples

```
## Not run:
{
data(iq)
n <- length(iq[1,])
t.iq <- (iq[1,]-mean(as.numeric(iq)))/(sd(iq[1,])/sqrt(n))
r.t <- (rt(100000, n-1)*(sd(iq)/sqrt(n))) + mean(as.numeric(iq))
quantile(r.t,c(0.01,0.10,0.25,0.5,0.75,0.90,0.99))
r.sigma.sq <- 1/rgamma(100000,shape=(n-2)/2, rate=var(as.numeric(iq))*(n-1)/2)
quantile(sqrt(r.sigma.sq), c(0.01,0.10,0.25,0.5,0.75,0.90,0.99))
}
## End(Not run)
```

---

italy.parties	*italy.parties*

Description

Italian Parties Data. Vote share of Italian parties from 1948-1983. See page 370-371.

Usage

```
data(italy.parties)
```

---

lunatics	*lunatics*

Description

An 1854 study on mental health in the fourteen counties of Massachusetts yields data on 14 cases. This study was performed by Edward Jarvis (then president of the American Statistical Association)

The variables included in the dataset are:

- NBR the number of "lunatics" per county.
- DISt distance to the nearest mental healthcare center
- POP population in the county by thousands
- PDEN population per square county mile
- PHOME the percent of "lunatics" cared for in the home

Usage

```
data(lunatics)
```

---

marriage.rates	*Marriage Rates in Italy*

Description

Italian Marriage Rates. See page 430

Usage

```
data(marriage.rates)
```

Format

a vector containing 16 numbers

Source

Columbo, B. (1952). Preliminary Analysis of Recent Demographic Trends in Italy. Population Index 18, 265-279.

---

metropolis	*metropolis*

Description

Implementation of metropolis function, p. 359.

Usage

```
metropolis(theta.matrix,reps,I.mat)
```

Arguments

theta.matrix	theta.matrix
reps	reps
I.mat	I.mat

Author(s)

Jeff Gill

---

militarydf	*militarydf*

Description

A dataset of two variables. The proportional changes in military personnel for the named countries. See page 483-484

The variables included in the dataset are:

- Year The year selected to evaluate
- Yugoslavia The proportion change in the size of Yugoslavia's military
- Albania The proportion change in the size of Albania's military
- Bulgaria The proportion change in the size of Bulgaria's military
- Czechoslovakia The proportion change in the size of Czechoslovakia's military

- `German.Dem.Republic` The proportion change in the size of the German Democratic Republic's military
- `Hungary` The proportion change in the size of Hungary's military
- `Poland` The proportion change in the size of Poland's military
- `Rumania` The proportion change in the size of Romania's military
- `USSR` The proportion change in the size of the Soviet Union's military

Usage

    data(militarydf)

Format

a data frame with 35 observations of years from 1949 to 1983 with 10 explanatory variables

Source

Faber, J. (1989). Annual Data on Nine Economic and Military Characteristics of 78 Nations (SIRE NATDAT), 1948-1983. Ann Arbor: Inter-University Consortium for Political and Social Research and Amsterdam, and Amsterdam, the Netherlands: Europa Institute, Steinmetz Archive.

---

nc.sub.dat   *nc.sub.dat*

Description

North Carolina county level health data from the 2000 U.S. census and North Carolina public records, see page 78.

The variables included in the dataset are:

- `Substantiated.Abuse` within family documented abuse for the county
- `Percent.Poverty` percent within the county living in poverty, U.S. definition
- `Total.Population` county population/1000

Usage

    nc.sub.dat

Format

data frame with 100 observations of different counties in North Carolina with 3 explanatory variables

Source

data from 2000 US census and North Carolina Division of Public Health, Women's and Children's Health Section in Conjunction with State Center for Health Statistics

---

norm.known.var   *norm.known.var*

Description

A function to calculate posterior quanties for a normal-normal model with known variance (pages 70-72). It produces the posterior mean, variance, and 95% credible interval for user-specified prior.

Usage

```
norm.known.var(data.vec,pop.var,prior.mean,prior.var)
```

Arguments

data.vec	a vector of assumed normally distributed data
pop.var	known population variance
prior.mean	mean of specified prior distribution for mu
prior.var	variance of specified prior distribution for mu

Author(s)

Jeff Gill

---

normal.posterior.summary

normal posterior summary

Description

A function to calculate posterior quantities of bivariate normals. See pages 74-80.

Usage

```
normal.posterior.summary(reps)
```

Arguments

reps	a matrix where the columns are defined as in the output of biv.norm.post:

Author(s)

Jeff Gill

See Also

biv.norm.post

---

norr   *norr*

Description

An 1854 study on mental health in the fourteen counties of Massachusetts yields data on 14 cases. This study was performed by Edward Jarvis (then president of the American Statistical Association)

The variables included in the dataset are:

- `Current.policy` Current sentencing policy
- `Past.execution.rate` Past execution rate
- `Politicla.Culture` Political culture
- `Current.opinion` Current opinion
- `Citizen.ideology` Citizen ideology
- `Murder.Rate` Murder rate
- `Catholic` Catholic
- `Black` Black
- `Urban` Urban
- `Past.laws` Past laws
- `Past.opinion` Past opinion

Usage

```
data(norr)
```

---

opic   *opic*

Description

private capital investment data. See Page 390.

The variables included in the dataset are:

- `Fund` Name of the private company
- `Age` Years the company has been in existence
- `Status` Whether the company is investing or divesting
- `Size` Maximum fund size in millions

Usage

```
data(opic)
```

`pbc.vote`   *pbc.vote*

Description

Precinct level data for Palm Beach County, Florida from the 2000 U.S. Presidential Election, see page 149

The variables included in the dataset are:

- `badballots` Total number of spoiled ballots
- `technology` Voting Technology used, 0 for a datapunch machine or a butterfly ballot, 1 for votomatic
- `new` Number of "new" voters, as in those who have not voted in the precinct for previous 6 years
- `size` Total number of precinct voters
- `Republican` The number of voters registered as Republican
- `white` The number of white nonminority voters in a given precinct

Usage

```
data(pbc.vote)
```

Format

data frame with 516 observations of each precinct in Palm Beach County with 11 explanatory variables

Source

Palm Beach Post collected data from state and federal sources about precinct level data in Palm Beach County for the 2000 US presidential election

---

`plot_walk_G`   *plot_walk_G*

Description

plot_walk_G code used to produce figure 10.2

Usage

```
plot_walk_G(walk.mat,sim.rm,X=1,Y=2)
```

Arguments

`walk.mat`	walk.mat
`sim.rm`	sim.rm
`X`	X
`Y`	Y

Author(s)

Jeff Gill

`plot_walk_MH`	*plot_walk_MH*

Description

plot_walk_MH code used to produce figure 10.4

Usage

```
plot_walk_MH(walk.mat)
```

Arguments

`walk.mat`	walk.mat

Author(s)

Jeff Gill

`recidivism`	*recidivism*

Description

Recidivism Rates. See page 188

The variables included in the dataset are:

- `Crime.Type` The type of crime committed
- `Released` The number of individuals released from a facility
- `Returned` The number of individuals returned to a facility
- `Percentage` (The number of individuals returned to a facility)/(The number of individuals released from a facility)

Usage

```
data(recidivism)
```

Format

data frame with 27 observations of different crime types with 5 explanatory variables

Source

state-level recidivism data as collected by the Oklahoma Department of Corrections from January 1, 1985 to June 30, 1999

---

retail.sales   *retail.sales*

Description

Retail sales from 1979 through 1989 based on data provided by the U.S. Department of Commerce through the Survey of Current Business, see page 439

The variables included in the dataset are:

- TIME the economic quarter specified, starting from the first quarter of 1979 where j=1 to the fourth quarter of 1989 where j=44
- DSB national income wage and salary disbursements (in billions of dollars)
- EMP employees on non-agricultural payrolls (in thosuands)
- BDG building material dealer sales (in millions of dollars)
- CAR retail automotive dealer sales (in millions of dollars)
- FRN home furnishings dealer sales (in millions of dollars)
- GMR general merchandise dealer sales (in millions of dollars)

Usage

```
data(retail.sales)
```

Format

data frame with 44 observations of statistics for different economic quarters with 7 explanatory variables

Source

U.S. Department of Commerce data from first quarter of 1979 to fourth quarter of 1989

---

rmultinorm   *rmultinorm*

Description

a function to generate random multivariate Gaussians.

Usage

```
rmultinorm(n, mu, vmat, tol = 1e-07)
```

Arguments

n	nu
mu	vector of mean
vmat	variance-covariance matriz
tol	tolerance

Author(s)

Jeff Gill

See Also

biv.norm.post

---

romney   *romney*

Description

Analysis of cultural consensus data using binomial likelihood and beta prior.

Usage

```
romney()
```

Format

See for yourself. Modify as desired.

Author(s)

Jeff Gill

Source

Romney, A. K. (1999). Culture Consensus as a Statistical Model.
Current Anthropology 40 (Supplement), S103-S115.

---

sir	*sir*

Description

Implementation of Rubin's SIR, see pages 338-341 (2nd Edition)

Usage

```
sir(data.mat,theta.vector,theta.mat,M,m,tol=1e-06,ll.func,df=0)
```

Arguments

data.mat	A matrix with two columns of normally distributed data
theta.vector	The initial coefficient estimates
theta.mat	The initial vc matrix
M	The number of draws
m	The desired number of accepted values
tol	The rounding/truncing tolerance
ll.func	loglike function for empirical posterior
df	The df for using the t distribution as the approx distribution

Author(s)

Jeff Gill

Examples

```
## Not run:
sir <- function(data.mat,theta.vector,theta.mat,M,m,tol=1e-06,ll.func,df=0) {
 importance.ratio <- rep(NA,M)
 rand.draw <- rmultinorm(M,theta.vector,theta.mat,tol = 1e-04)
 if (df > 0)
   rand.draw <- rand.draw/(sqrt(rchisq(M,df)/df))
 empirical.draw.vector <- apply(rand.draw,1,ll.func,data.mat)
 if (sum(is.na(empirical.draw.vector)) == 0) {
   print("SIR: finished generating from posterior density function")
   print(summary(empirical.draw.vector))
 }
 else {
   print(paste("SIR: found",sum(is.na(empirical.draw.vector)),
               "NA(s) in generating from posterior density function, quiting"))
```

```
    return()
  }
  if (df == 0) {
    normal.draw.vector <- apply(rand.draw,1,normal.posterior.ll,data.mat)
  }
  else {
    theta.mat <- ((df-2)/(df))*theta.mat
    normal.draw.vector <- apply(rand.draw,1,t.posterior.ll,data.mat,df)
  }
  if (sum(is.na(normal.draw.vector)) == 0) {
    print("SIR: finished generating from approximation distribution")
    print(summary(normal.draw.vector))
  }
  else {
    print(paste("SIR: found",sum(is.na(normal.draw.vector)),
                "NA(s) in generating from approximation distribution, quiting"))
    return()
  }
  importance.ratio <- exp(empirical.draw.vector - normal.draw.vector)
  importance.ratio[is.finite=F] <- 0
  importance.ratio <- importance.ratio/max(importance.ratio)
if (sum(is.na(importance.ratio)) == 0) {
 print("SIR: finished calculating importance weights")
 print(summary(importance.ratio))
}
else {
  print(paste("SIR: found",sum(is.na(importance.ratio)),
              "NA(s) in calculating importance weights, quiting"))
  return()
}
 accepted.mat <- rand.draw[1:2,]
while(nrow(accepted.mat) < m+2) {
  rand.unif <- runif(length(importance.ratio))
  accepted.loc <- seq(along=importance.ratio)[(rand.unif-tol) <= importance.ratio]
  rejected.loc <- seq(along=importance.ratio)[(rand.unif-tol) > importance.ratio]
  accepted.mat <- rbind(accepted.mat,rand.draw[accepted.loc,])
  rand.draw <- rand.draw[rejected.loc,]
  importance.ratio <- importance.ratio[rejected.loc]
  print(paste("SIR: cycle complete,",(nrow(accepted.mat)-2),"now accepted"))
}
accepted.mat[3:nrow(accepted.mat),]
}
# The following are log likelihood functions that can be plugged into the sir function above.

logit.posterior.ll <- function(theta.vector,X) {
  Y <- X[,1]
  X[,1] <- rep(1,nrow(X))
  sum( -log(1+exp(-X
                  -log(1+exp(X)))))
}

normal.posterior.ll <- function(coef.vector,X) {
  dimnames(coef.vector) <- NULL
```

```
  Y <- X[,1]
  X[,1] <- rep(1,nrow(X))
  e <- Y - X
  sigma <- var(e)
  return(-nrow(X)*(1/2)*log(2*pi)
         -nrow(X)*(1/2)*log(sigma)
         -(1/(2*sigma))*(t(Y-X)*(Y-X)))
}

t.posterior.ll <- function(coef.vector,X,df) {
  Y <- X[,1]
  X[,1] <- rep(1,nrow(X))
  e <- Y - X
  sigma <- var(e)*(df-2)/(df)
  d <- length(coef.vector)
 return(log(gamma((df+d)/2)) - log(gamma(df/2))
       - (d/2)*log(df)
       -(d/2)*log(pi) - 0.5*(log(sigma))
       -((df+d)/2*sigma)*log(1+(1/df)*
                              (t(Y-X*(Y-X)))))
}

probit.posterior.ll <- function (theta.vector,X,tol = 1e-05) {
  Y <- X[,1]
  X[,1] <- rep(1,nrow(X))
  Xb <- X
  h <- pnorm(Xb)
  h[h<tol] <- tol
  g <- 1-pnorm(Xb)
  g[g<tol] <- tol
  sum( log(h)*Y + log(g)*(1-Y) )
}

## End(Not run)
```

---

socatt	*socatt*

Description

Data from the British Social Attitudes (BSA) Survey 1983-1986.

The variables included in the dataset are:

- `District` identifying for geographic district.
- `Respondent.Code` respondent identifier
- `Year.Code` 1 = 1983, 2 = 1984, 3 = 1985, 4 = 1986
- `Num.Answers` number of positive answers to seven questions
- `Party` 1 = Conservative, 2 = Labour, 3 = Lib/SDP/Alliance, 4 = others

- `Social.Class` 1 = middle, 2 = upper working, 3 = lower working
- `Gender` 1 = male, 2 = female.
- `Age` age in years 18-80
- `Religion` 1 = Roman Catholic, 2 = Protestant/Church of England, 3 = others, 4 = none.

Usage

```
data(socatt)
```

---

strikes   *strikes*

Description

French Coal Strikes, see page 212 and 213

The variables included in the dataset are:

- `Year` The year the labor strikes in France occurred
- `Counts` The number of labor strikes that occurred in France per year

Usage

```
data(strikes)
```

Format

data frame with 11 observations of strikes that occurred in different years with 1 explanatory variable

Source

Conell, C. and Cohn, S. (1995). Learning from Other People's Actions: Environmental Variation and Diffusion in French Coal Mining Strikes, 1890-1935. American Journal of Sociology 101, 366-403.

Examples

```
n <- length(strikes)
r <- 1
s.y <- sum(strikes)

p.posterior.1000000 <- rbeta(1000000,n*r,s.y+0.5)
length(p.posterior.1000000[p.posterior.1000000<0.05])/1000000

par(mar=c(3,3,3,3))
ruler <- seq(0,1,length=1000)
beta.vals <- dbeta(ruler,n*r,s.y+0.5)
plot(ruler[1:200],beta.vals[1:200],yaxt="n",main="",ylab="",type="l")
```

```
mtext(side=2,line=1,"Density")
for (i in 1:length(ruler))
  if (ruler[i] < 0.05)
    segments(ruler[i],0,ruler[i],beta.vals[i])
segments(0.04,3,0.02,12.2)
text(0.02,12.8,"0.171")
```

terrorism	*terrorism*

Description

Dataset comparing incidents of terrorism to car accidents, suicide, and murder, see page 140

The variables included in the dataset are:

- Year The given year in which the statistics occurred
- X.Terrorism The number of terrorist attacks that would occur per 100000 in the given year
- X.Car.Accidents The number of car accidents that would occur per 100000 in the given year
- X.Suicide The number of suicide that would occur per 100000 in the given year

Usage

```
data(terrorism)
```

Format

data frame with 14 observations of death rates for different years with 5 explanatory variables

Source

Falkenrath, R. (2001). Analytical Models and Policy Prescription: Understanding Recent Innovation in U.S. Counterterrorism. Studies in Conflict and Terrorism 24, 159-181.

texas	*texas*

Description

Poverty in Texas, see page 299

The variables included in the dataset are:

- POV a dichotomous outcome variable indicates whether 20% or more of the county's residents live in poverty
- BLK the proportion of Black residents in the county
- LAT the proportion of Latino residents in the county

- GVT a dichotomous variable indicating whether government activities contributed a weighted annual average of 25
- SVC a dichotomous variable indicating whether service activities contributed a weighted annual average of 50
- FED a dichotomous variable indicating whether federally owned lands make up 30
- XFR a dichotomous factor indicating whether income from transfer payments (federal, state, and local) contributed a weighted annual average of 25 percent or more of total personal income over the past three years
- POP the log of the county population total for 1989

Usage

```
data(texas)
```

---

t_ci_table   *t_ci_table*

Description

A function to calculate credible intervals and make a table. See page 169.

Usage

```
t_ci_table(coefs,cov.mat,level=0.95,degrees=Inf,quantiles=c(0.025,0.500,0.975))
```

Arguments

coefs	vector of coefficient estimates, usually posterior means
cov.mat	variance-covariance matrix
level	desired coverage level
degrees	degrees of freedom parameter for students-t distribution assumption
quantiles	vector of desired CDF points (quantiles) to return

Value

quantile.mat matrix of quantiles

Author(s)

Jeff Gill

wars	*wars*

Description

Data for Chinese wars example, see page 163

The variables included in the dataset are:

- ONSET ratio-level variable measuring the epochal (whether historical or calendar) time of event occurrence, measured in calendar year
- TERM ratio-level variable measuring the epochal (historical) time of event conclusion, measured in calendar year
- EXTENT number of belligerents involved on all sides of the war
- ETHNIC intra-group or inter-group conflict
- DIVERSE number of ethnic groups participating as belligerents
- ALLIANCE total number of alliances among belligerents
- DYADS number of alliance pairs
- POL.LEV nominal-level variable measuring the political level of belligerent involvement regarding domestic and foreign belligerents, with a 1 for internal war, 2 for interstate war
- COMPLEX governmental level of the warring parties, where the first variable is multiplied by ten for scale purposes
- POLAR number of relatively major or great powers at the time of onset
- BALANCE the difference in military capabilities: minor-minor, minor-major, major-major
- TEMPOR type of war: protracted rivalry, integrative conquest, disintegrative/fracturing conflict, sporadic event
- SCOPE political scope of conflicts in terms of governmental units affected
- DURATION duration of conflict, measured in years

Usage

```
data(wars)
```

Format

a data frame of 104 observations of different China wars with 15 explanatory variables

Source

Cioffi-Revilla, C. and Lai, D. (1995). War and Politics in Ancient China, 2700 B.C. to 722 B.C.: Measurement and Comparative Analysis. Journal of Conflict Resolution 39, 467-494.

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