

Analyses for stickleback landscape parasitology study

Pascal I. Hablützel and Io S. Deflem

2022-11-27

1. Description

This R Markdown document describes the analyses performed for the manuscript entitled “Environmental pollution correlates with parasite infection across a riverine landscape” by Io S. Deflem, Seppe Marchand, Federico C.F. Calboli, Joost A.M. Raeymaekers, Filip A.M. Volckaert and Pascal I. Hablützel.

The analyses were run in R 4.2.2

2. Study area and sampling

Up to thirty 0+ three-spined sticklebacks were sampled at 37 locations in the Dijle and Demer basins in Belgium during autumn 2016 under a permit of the Flemish Agency Nature and Forest (Fig. 1). Both basins together cover a continuous surface area of 3,624 km² with the furthest two sampling sites being located 117 km apart (distance measured along rivers). All locations included small and relatively slow flowing streams (drop off from highest to lowest point is 18 m) covering a wide range of ecological, hydromorphological, and physico-chemical characteristics. Fish were caught using a dip net.

3. Setting up working environment

```
# Empty environment
rm(list=ls())

# Set working directory to location where script is stored
setwd(dirname(rstudioapi::getActiveDocumentContext()$path)) # requires installation of package "rstudioapi"

# Loading required libraries
require(BAS)

## Loading required package: BAS

require(boral)

## Loading required package: boral

## Loading required package: coda

## This is boral version 2.0. If you recently updated boral, please check news(package = "boral") for the latest information
```

```

require(car)

## Loading required package: car

## Loading required package: carData

require(corrplot)

## Loading required package: corrplot

## corrplot 0.92 loaded

require(ggplot2)

## Loading required package: ggplot2

require(gplots)

## Loading required package: gplots

## 
## Attaching package: 'gplots'

## The following object is masked from 'package:stats':
## 
##     lowess

require(vegan)

## Loading required package: vegan

## Loading required package: permute

## Loading required package: lattice

## This is vegan 2.6-4

```

4 Loading and preparing host and parasite data

Fish were euthanized with a lethal dose of MS222 on the day of capture, following directions of the KU Leuven Animal Ethics Commission, and stored at -20 °C. Fish were kept in separate containers per site at all times. Lab based parasite screening of thawed fish involved placing individual fish in 5 or 10 ml cryotubes with 1 or 2 ml of distilled water. Following a vigorous shake of 10 s, the liquid was poured into a Petri dish and ectoparasites were identified and counted using a stereomicroscope. Fish were rinsed and checked again for the presence of ectoparasites on skin and fins. The intestines were examined for endoparasites. Before dissection, fish weight (\pm 0.1 mg) and standard length (\pm 1 mm) were recorded. To quantify body condition, we calculated the scaled mass index (SMI; Maceda-Veiga et al., 2014; Peig & Green, 2009). Sex was determined during dissection by inspection of gonad development. A total of 668 fish were dissected, which amounts to approximately 20 fish per location, with the exception of seven locations where only 10 fish were screened for the presence of macroparasites. Ecto- and endoparasites were morphologically identified to species level whenever possible.

```

# Parasite data
data <- read.csv("data_2016_2303.csv", sep=';')
data$site <- as.factor(data$site)

# Calculate parasite parameters
#names(data)
#parasite data is overdispersed (mostly so for Trichodina), if using average abundance data, species ma
datao <- na.omit(data[,c(1,22:24,26:32)]) #remove fish without parasite counts

ddata <- dispweight(datao[,-1]) #correct for overdispersion of the parasite count data
avab <- aggregate(ddata, by = list(datao[,1]), function(x){mean(x, na.rm =T)})
prev = aggregate(data[,c(22:24,26:32)], by = list(data[,1]), function(x){sum(x >0, na.rm = T)/length(x)})
medin = aggregate(data[,c(22:24,26:32)], by = list(data[,1]), function(x){median(x[x >0], na.rm = T)})
pa = aggregate(data[,c(22:24,26:32)], by = list(data[,1]), function(x){ifelse(mean(x, na.rm =T)>0,1,0)})

avab[is.na(avab)] <- 0
prev[is.na(prev)] <- 0
medin[is.na(medin)] <- 0

# Host condition data
avcondition <- aggregate(data$SMI, by = list(data[,1]), function(x){mean(x, na.rm =T)}) [,2]
avlength <- aggregate(data$length, by = list(data[,1]), function(x){mean(x, na.rm =T)}) [,2]

# Parasite index
sgyr <- 1:nrow(data)
stri <- 1:nrow(data)
sglu <- 1:nrow(data)
scon <- 1:nrow(data)
scysl <- 1:nrow(data)
spro <- 1:nrow(data)
saca <- 1:nrow(data)
scam <- 1:nrow(data)
sang <- 1:nrow(data)

for(j in 1:nrow(data)){
  sgyr[j] <- data$Gyr[j]/sd(data$Gyr, na.rm=T)
  stri[j] <- data$Tri[j]/sd(data$Tri, na.rm=T)
  sglu[j] <- data$Glu[j]/sd(data$Glu, na.rm=T)
  scon[j] <- data$Con[j]/sd(data$Con, na.rm=T)
  scysl[j] <- data$CysL[j]/sd(data$CysL, na.rm=T)
  spro[j] <- data$Pro[j]/sd(data$Pro, na.rm=T)
  saca[j] <- data$Aca[j]/sd(data$Aca, na.rm=T)
  scam[j] <- data$Cam[j]/sd(data$Cam, na.rm=T)
  sang[j] <- data$Ang[j]/sd(data$Ang, na.rm=T)
}

PI <- 1:nrow(data)
for(j in 1:nrow(data)){
  PI[j] <- 10/max(sgyr, na.rm=T)*sgyr[j] + 10/max(stri, na.rm=T)*stri[j] + 10/max(sglu, na.rm=T)*sglu[j]
  PI[j] <- PI[j] + 10/max(scon, na.rm=T)*scon[j] + 10/max(scysl, na.rm=T)*scysl[j] + 10/max(spro, na.rm=T)*spro[j]
  PI[j] <- PI[j] + 10/max(saca, na.rm=T)*saca[j] + 10/max(scam, na.rm=T)*scam[j] + 10/max(sang, na.rm=T)*sang[j]
}

```

```

PI_ecto <- 1:nrow(data)
for(j in 1:nrow(data)){
  PI_ecto[j] <- 10/max(sgyr, na.rm=T)*sgyr[j] + 10/max(stri, na.rm=T)*stri[j] + 10/max(sglu, na.rm=T)
}

PI_endo <- 1:nrow(data)
for(j in 1:nrow(data)){
  PI_endo[j] <- 10/max(scon, na.rm=T)*scon[j] + 10/max(scysl, na.rm=T)*scysl[j] + 10/max(spro, na.rm=T)
  10/max(saca, na.rm=T)*saca[j] + 10/max(scum, na.rm=T)*scum[j] + 10/max(sang, na.rm=T)*sang[j]
}

avPI <- aggregate(PI, by = list(data[,1]), function(x){mean(x, na.rm =T)})[,2]
avPI_ecto <- aggregate(PI_ecto, by = list(data[,1]), function(x){mean(x, na.rm =T)})[,2]
avPI_endo <- aggregate(PI_endo, by = list(data[,1]), function(x){mean(x, na.rm =T)})[,2]

```

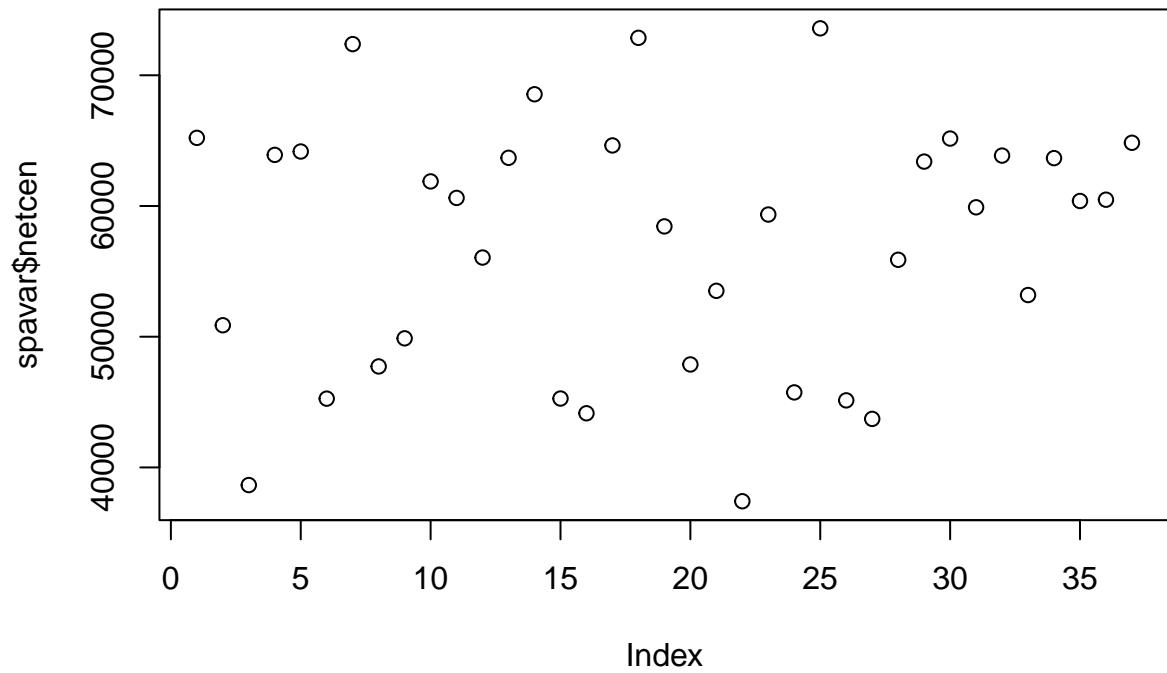
5 Loading and preparing environmental and spatial data

Physico-chemical data was provided by the Flemish Environmental Agency (VMM). Each fish sampling site was chosen at or near an environmental monitoring site of VMM. Water parameters include water temperature, pH, conductivity, dissolved oxygen (O_2), saturation with dissolved oxygen, and Biochemical and Chemical Oxygen Demand (BOD and COD). Nutrient related water parameters include measurements of nitrate (NO_3^-), nitrite (NO_2^-), Kjeldahl nitrogen (KjN), total nitrogen (Nt), ammonium (NH_4^+), and total phosphorus (Pt). Following removal of strong collinear variables (significant correlation with $P < 0.05$ and Pearson correlation coefficient $> |0.6|$; Dormann et al., 2013), six environmental physico-chemical variables were retained (temperature, conductivity, COD, saturation with dissolved oxygen, ammonium, and total nitrogen), representing different aspects of water quality. For each water parameter, the average value of the year before sampling was calculated based on monthly monitoring data. Additionally, two hydromorphological variables were included: The presence of a pool-riffle pattern and meanders were noted during field sampling and these parameters were included as binary variables (presence/absence) for a representation of abiotic habitat structure. Spatial (waterway) distances were calculated using the Network Analyst toolbox in ArcGIS. Upstream distance was defined as the maximal upstream distance from the sampling location. Network peripherality was calculated as the average waterway distance of a sampling location to all other locations. Hence, a total of eight environmental and two spatial variables were included in the statistical analysis.

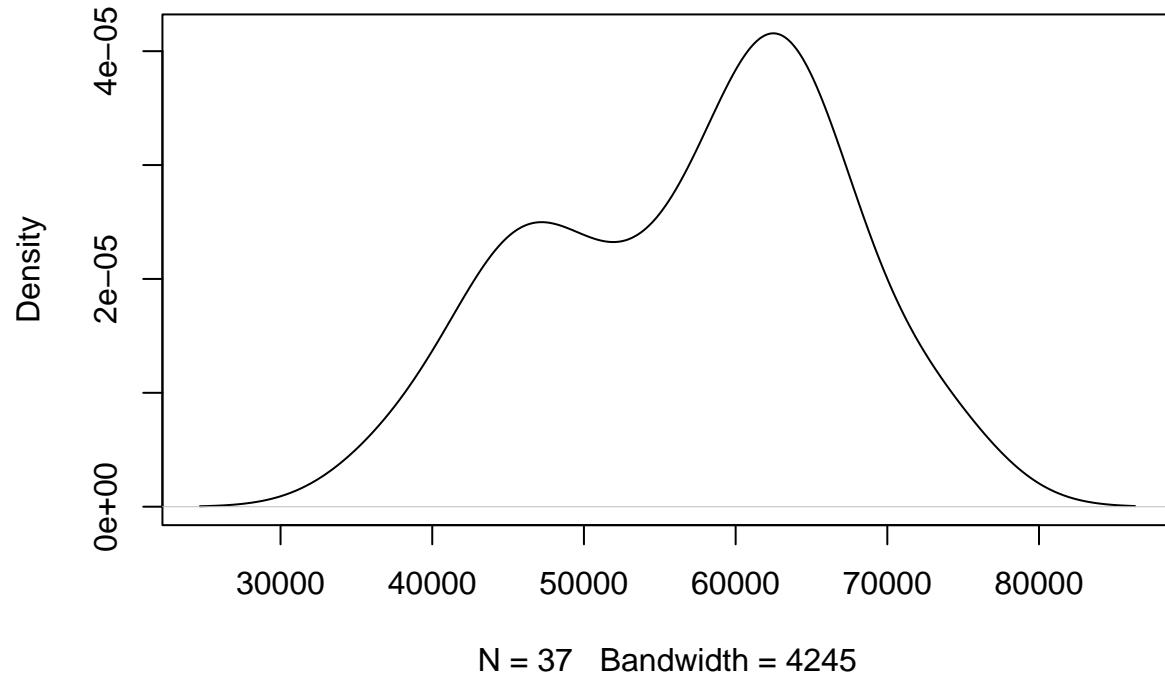
```

# Environmental data (VMM)
environment <- read.csv("Environment_update.csv", sep=';')
spavar <- read.csv("space2.csv", sep=';') #spatial variables: network centrality and upstream distance
plot(spavar$netcen); plot(density(spavar$netcen))

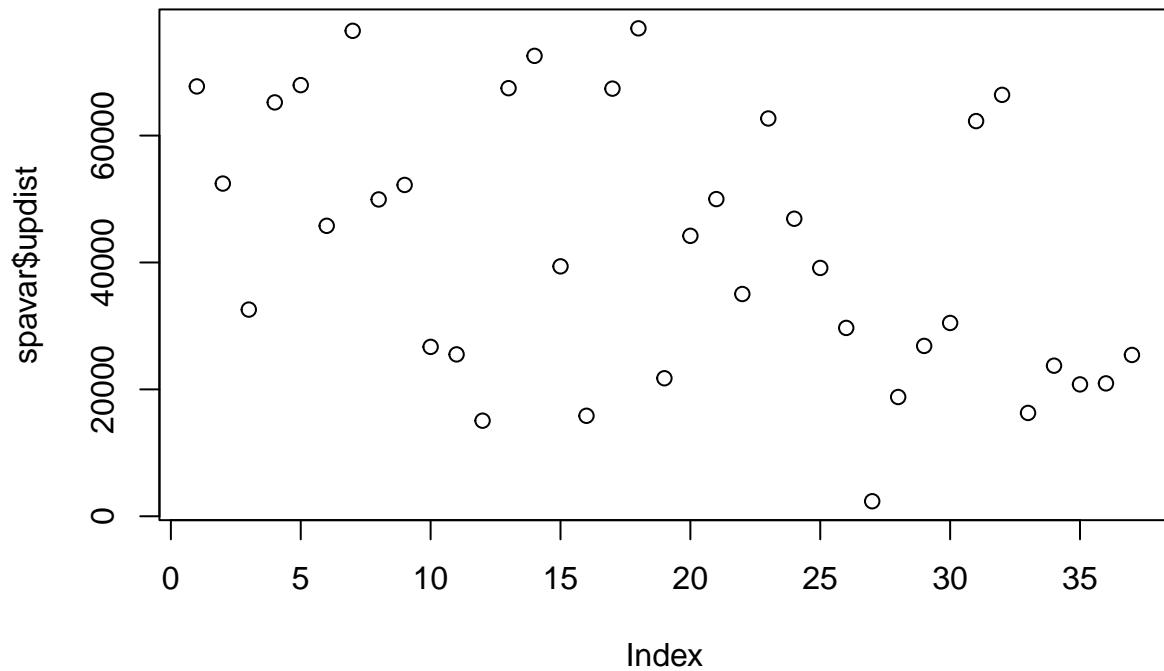
```

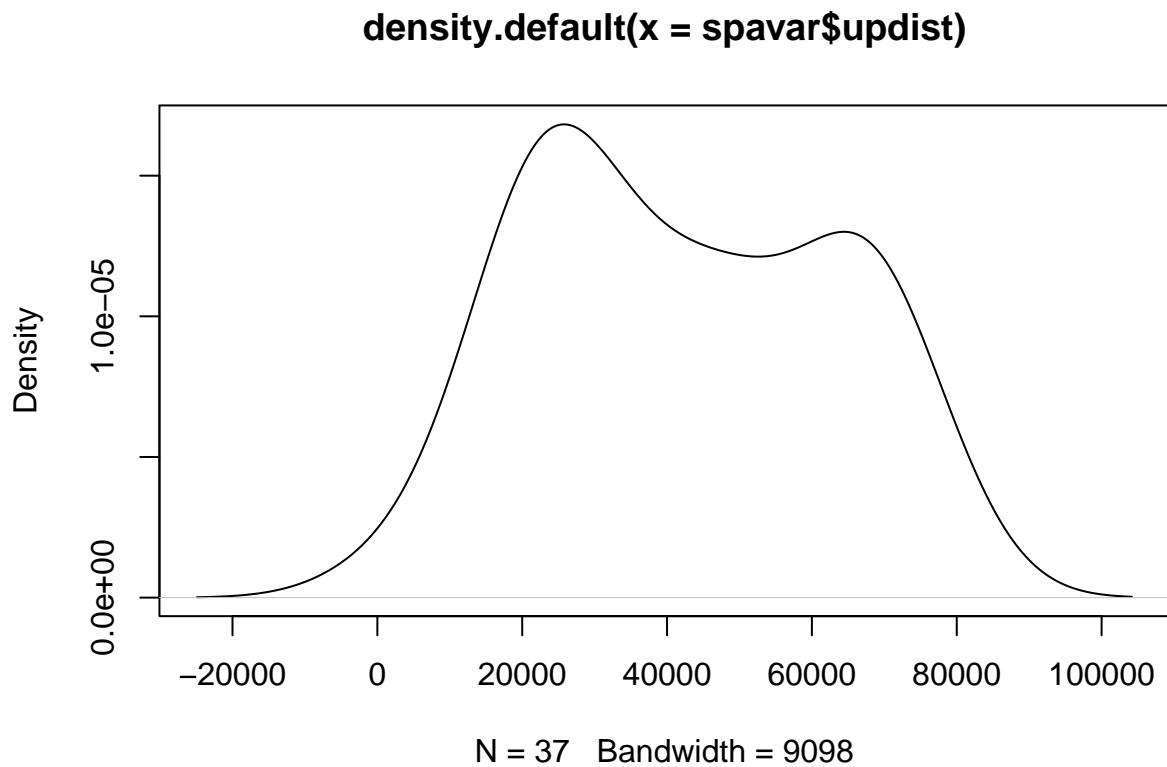


density.default(x = spavar\$netcen)



```
plot(spavar$updist); plot(density(spavar$updist))
```





```
# Environmental data (from field observations)
field_data <- read.csv("field_data.csv", sep=',')
environment2 <- cbind(environment[,c(1,49,52:53,55,57,60,63)], field_data[-c(8,10,25,27,37),33:34], spa
environment2$pool_riffle <- as.factor(environment2$pool_riffle)
environment2$meander <- as.factor(environment2$meander)

netcen <- spavar$netcen
updist <- spavar$updist
```

We used univariate generalized linear models to investigate how landscape-level effects modify infection patterns of individual parasite taxa, host size and condition. We kept the statistical models linear (as opposed to polynomial) and only considered main effects (i.e. no interaction terms) because we had no prior information from this study system that more complex models were necessary and because the study design with (only) 37 sampling sites was not intended for non-linear models. Ten explanatory variables (temperature, conductivity, COD, saturation with dissolved oxygen, ammonium, total nitrogen, the presence of pool-riffle patterns and meanders, upstream distance, and network peripherality) were included.

6. Univariate analysis using Bayesian Model Averaging

Univariate analyses - We used generalized linear models in a BMA approach to understand how infection with individual parasite taxa relate to host characteristics (length and condition), environmental conditions as well as spatial distance among sampling sites. Parasite infection was calculated in three ways at the host population level: average abundance (mean parasites per host), prevalence (percentage of infected hosts) and median infection intensity (median number of parasites in infected hosts). We calculated the individual parasitisation index (IPI) following Kalbe et al. (2002) as a measurement for total parasite abundance and

species richness for each individual fish. This index was calculated for all parasite species combined, and for ecto- and endoparasite species separately. For these models, we assumed a normal error distribution (which appeared to be justified, see Supplementary Figures S1-S2) and applied a Jeffrey-Zellner-Siow prior. Model assumptions (homoscedasticity of the variances and normal distribution of the errors) were assessed using the generic model plot function in R and did only not clearly deviate in any of the models for rare parasites. We followed a normal distribution, and not Poisson or negative binomial, for the parasite data for the common species (*Trichodina* sp. and *Gyrodactylus* spp.) and the individual parasitization index as the parameters used are deviates from count data. Rare parasites (*Glugea*, *Contracaecum*, *Anguillicoloides*, and unidentified cysts) were excluded from the univariate analysis because there was not enough data to obtain a good fit of the models. For rare parasites (*Contracaecum* sp. and *Anguillicoloides crassus*), we used population-level presence-absence data assuming a binomial error distribution and a uniformly distributed BIC prior. Due to low prevalences, the other parasites were not included in the species-specific models. Explanatory variables were considered important when they had a posterior inclusion probability (PIP) of 0.5. To account for overdispersion in the parasite counts, we transformed the data by downweighting overdispersed taxa following Clarke et al. (2006) using the dispweight function in the R package vegan v2.5.6 (Oksanen et al., 2013).

6.0.1 Figure

```
# Make a matrix for PIP (Posterior Inclusion Probability)
PIP <- matrix(nrow=12, ncol=14)
rownames(PIP) <- c("Host condition", "Host size", "Temperature", "Oxygen saturation", "Conductivity", "pH", "NH4._av", "Nt_av", "pool_riffle", "meander", "netcen", "updist", "data=environment2, prior="JZS")
colnames(PIP) <- c("Host condition", "Host size", "Gyrodactylus abundance", "Gyrodactylus prevalence", "Length", "Condition", "Abundance", "Prevalence", "PI", "PI ecto", "PI endo")

#Condition
bas.model <- bas.lm(avcondition ~ T_av + O2_sat_av + Con_av + COD_av
+ NH4._av + Nt_av + pool_riffle + meander + netcen +
updist, data=environment2, prior="JZS")
coef.model <- coef(bas.model)
pip <- summary(bas.model)
PIP[c(3:12),1] <- pip[2:11,1]*sign(coef.model$postmean[2:11])

#Length
bas.model <- bas.lm(avlength ~ T_av + O2_sat_av + Con_av + COD_av
+ NH4._av + Nt_av + pool_riffle + meander + netcen +
updist, data=environment2, prior="JZS")
coef.model <- coef(bas.model)
pip <- summary(bas.model)
PIP[c(3:12),2] <- pip[2:11,1]*sign(coef.model$postmean[2:11])

#Gyrodactylus abundance
bas.model <- bas.lm(avab$Gyr ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
+ NH4._av + Nt_av + pool_riffle + meander + netcen +
updist, data=environment2, prior="JZS")
coef.model <- coef(bas.model)
pip <- summary(bas.model)
PIP[c(1:12),3] <- pip[2:13,1]*sign(coef.model$postmean[2:13])

#Gyrodactylus prevalence
bas.model <- bas.lm(prev$Gyr ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
+ NH4._av + Nt_av + pool_riffle + meander + netcen +
updist, data=environment2, prior="JZS")
```

```

            updist, data=environment2, prior="JZS")
coef.model <- coef(bas.model)
pip <- summary(bas.model)
PIP[c(1:12),4] <- pip[2:13,1]*sign(coef.model$postmean[2:13])

#Gyrodactylus infection intensity
bas.model <- bas.lm(medin$Gyr ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
+ NH4._av + Nt_av + pool_riffle + meander + netcen +
updist, data=environment2, prior="JZS")
coef.model <- coef(bas.model)
pip <- summary(bas.model)
PIP[c(1:12),5] <- pip[2:13,1]*sign(coef.model$postmean[2:13])

#Trichodina abundance
bas.model <- bas.lm(avab$Tri ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
+ NH4._av + Nt_av + pool_riffle + meander + netcen +
updist, data=environment2, prior="JZS")
coef.model <- coef(bas.model)
pip <- summary(bas.model)
PIP[c(1:12),6] <- pip[2:13,1]*sign(coef.model$postmean[2:13])

#Trichodina prevalence
bas.model <- bas.lm(prev$Tri ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
+ NH4._av + Nt_av + pool_riffle + meander + netcen +
updist, data=environment2, prior="JZS")
coef.model <- coef(bas.model)
pip <- summary(bas.model)
PIP[c(1:12),7] <- pip[2:13,1]*sign(coef.model$postmean[2:13])

#Trichodina infection intensity
bas.model <- bas.lm(medin$Tri ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
+ NH4._av + Nt_av + pool_riffle + meander + netcen +
updist, data=environment2, prior="JZS")
coef.model <- coef(bas.model)
pip <- summary(bas.model)
PIP[c(1:12),8] <- pip[2:13,1]*sign(coef.model$postmean[2:13])

#Glugea
bas.model <- bas.glm(pa$Glu ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
+ NH4._av + Nt_av + pool_riffle + meander + netcen +
updist, data=environment2, betaprior=g.prior(100), family=binomial)
coef.model <- coef(bas.model)

## Warning in object$prior == "AIC" || object$prior == "BIC": 'length(x) = 266 > 1'
## in coercion to 'logical(1)'

## Warning in object$prior == "AIC" || object$prior == "BIC": 'length(x) = 266 > 1'
## in coercion to 'logical(1)'

pip <- summary(bas.model)
PIP[c(1:12),9] <- pip[2:13,1]*sign(coef.model$postmean[2:13])

#Contracaecum

```

```

bas.model <- bas.glm(pa$Con ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
                      + NH4_av + Nt_av + pool_riffle + meander + netcen +
                      updist, data=environment2, betaprior=g.prior(100), family=binomial)
coef.model <- coef(bas.model)

## Warning in object$prior == "AIC" || object$prior == "BIC": 'length(x) = 221 > 1'
## in coercion to 'logical(1)'

## Warning in object$prior == "AIC" || object$prior == "BIC": 'length(x) = 221 > 1'
## in coercion to 'logical(1)'

pip <- summary(bas.model)
PIP[c(1:12),10] <- pip[2:13,1]*sign(coef.model$postmean[2:13])

#Anguilllicola
bas.model <- bas.glm(pa$Ang ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
                      + NH4_av + Nt_av + pool_riffle + meander + netcen +
                      updist, data=environment2, betaprior=g.prior(100), family=binomial)
coef.model <- coef(bas.model)

## Warning in object$prior == "AIC" || object$prior == "BIC": 'length(x) = 661 > 1'
## in coercion to 'logical(1)'

## Warning in object$prior == "AIC" || object$prior == "BIC": 'length(x) = 661 > 1'
## in coercion to 'logical(1)'

pip <- summary(bas.model)
PIP[c(1:12),11] <- pip[2:13,1]*sign(coef.model$postmean[2:13])

#PI
bas.model <- bas.lm(avPI ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
                      + NH4_av + Nt_av + pool_riffle + meander + netcen +
                      updist, data=environment2, prior="JZS")
coef.model <- coef(bas.model)
pip <- summary(bas.model)
PIP[c(1:12),12] <- pip[2:13,1]*sign(coef.model$postmean[2:13])

#PI ecto
bas.model <- bas.lm(avPI_ecto ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
                      + NH4_av + Nt_av + pool_riffle + meander + netcen +
                      updist, data=environment2, prior="JZS")
coef.model <- coef(bas.model)
pip <- summary(bas.model)
PIP[c(1:12),13] <- pip[2:13,1]*sign(coef.model$postmean[2:13])

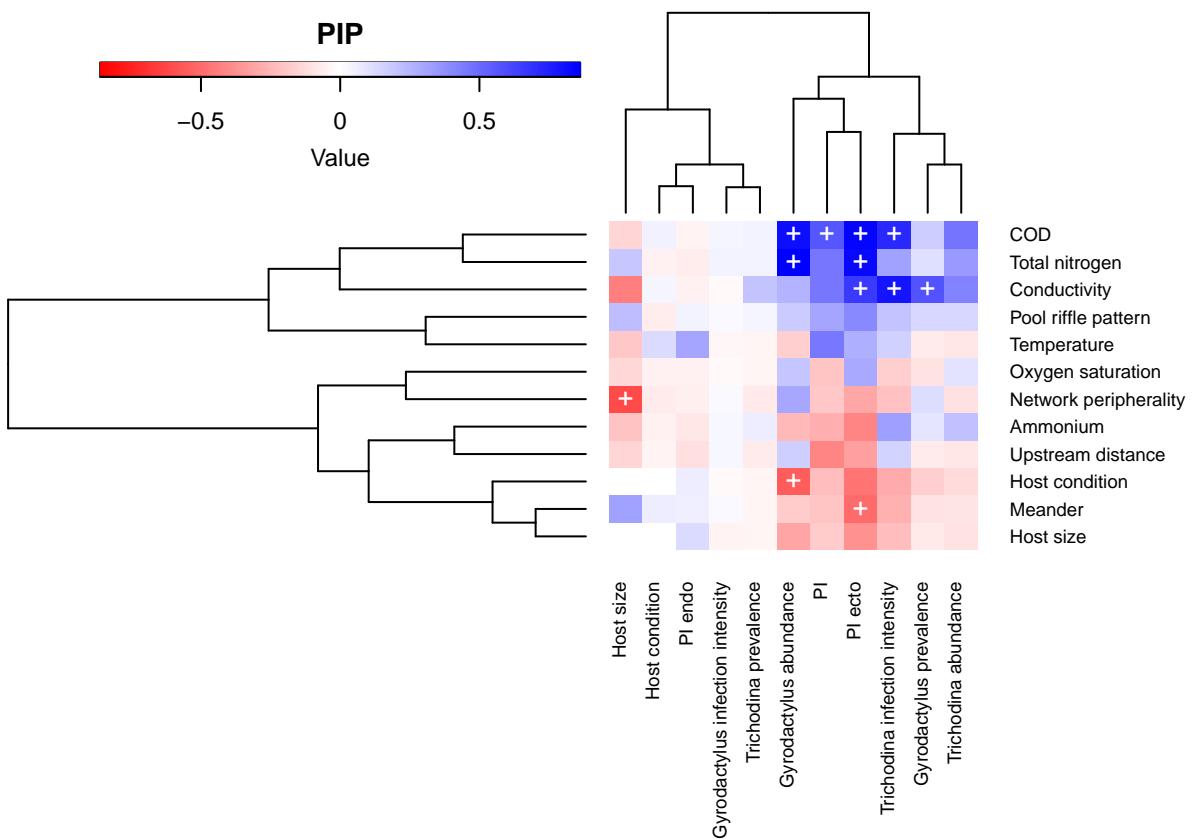
#PI endo
bas.model <- bas.lm(avPI_endo ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
                      + NH4_av + Nt_av + pool_riffle + meander + netcen +
                      updist, data=environment2, prior="JZS")
coef.model <- coef(bas.model)
pip <- summary(bas.model)
PIP[c(1:12),14] <- pip[2:13,1]*sign(coef.model$postmean[2:13])

```

```

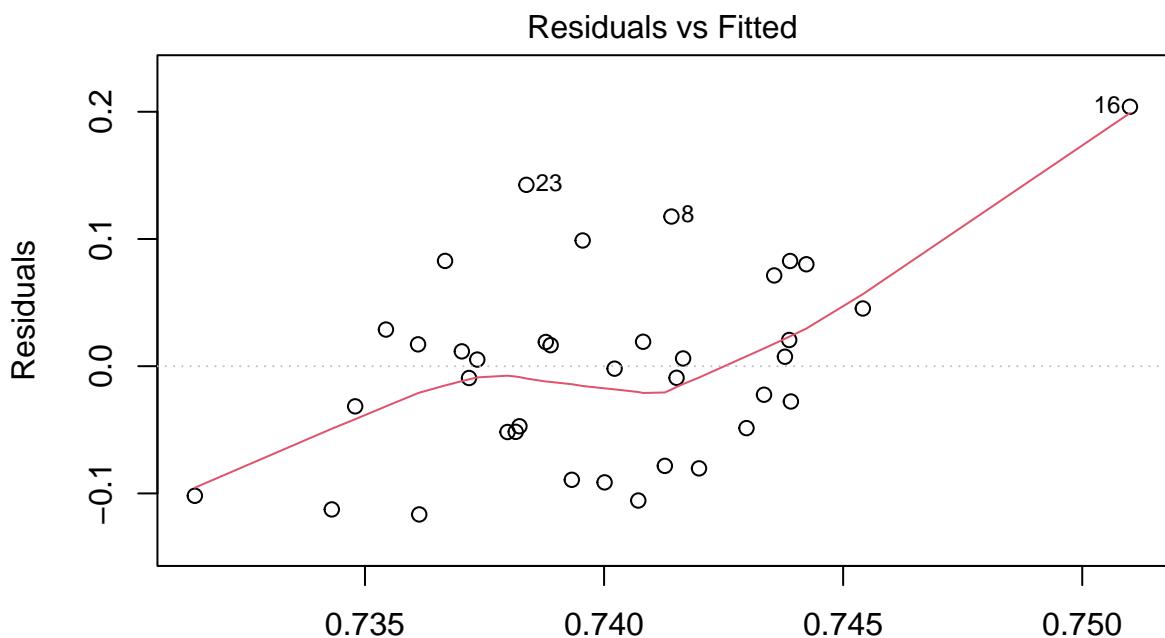
x = round(PIP, digits=2)
x[abs(PIP)<0.5] <- ""
x[abs(PIP)>0.5] <- "+"
heatmap.2(PIP[,-c(9,10,11)],
           cellnote = x[,-c(9,10,11)],
           #main = "Correlation",
           notece=1,
           notecl="white",
           density.info="none",
           trace="none",
           margins =c(10,8),
           col=redblue(256),
           dendrogram="both",
           cexRow = 0.7,
           cexCol = 0.7,
           key.title = "PIP",
           lhei = c(1,3),
           lwid = c(0.5, 0.5),
           #Colv="NA"
           )

```



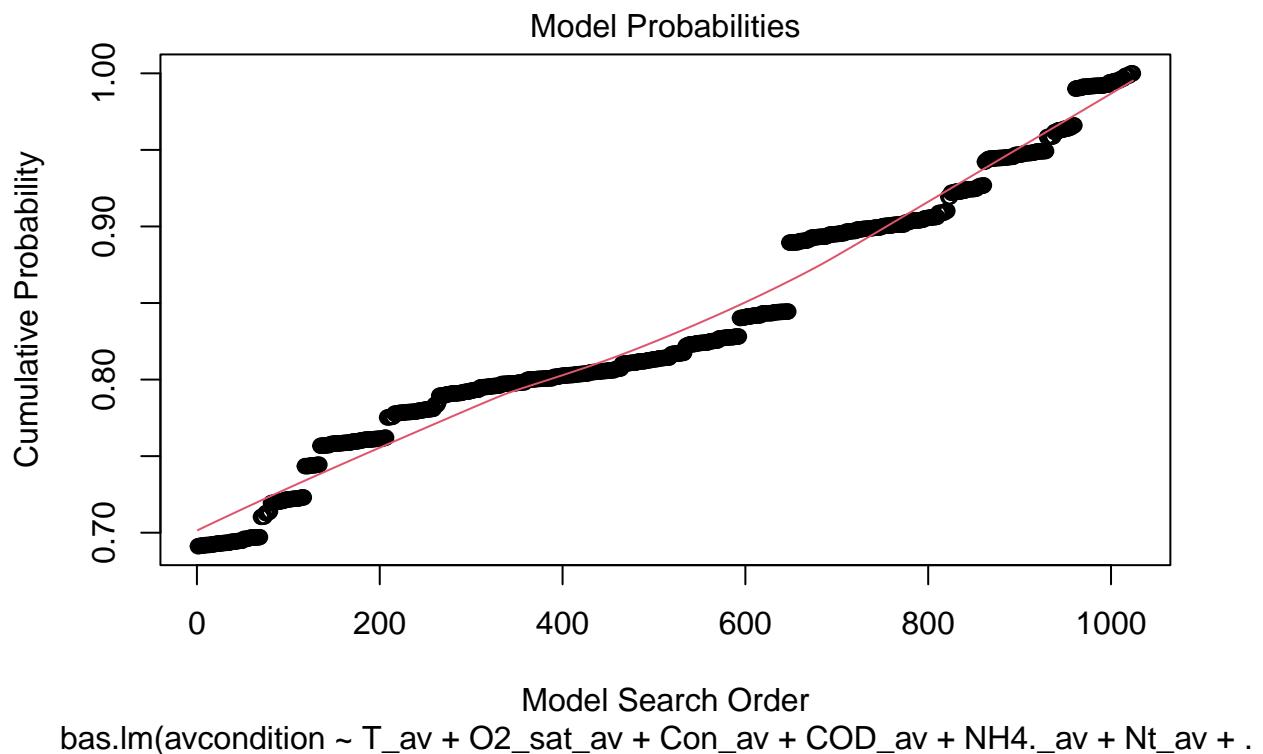
6.1 Variation in host condition

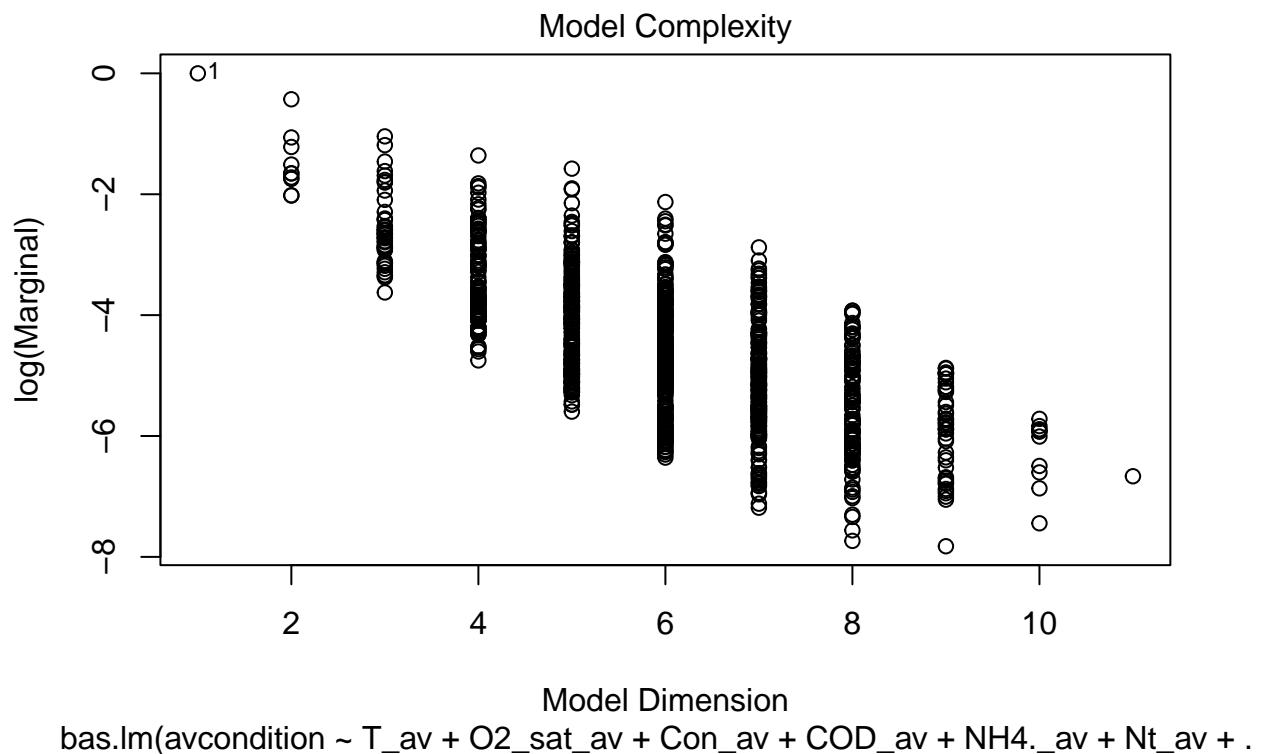
```
bas.model <- bas.lm(avcondition ~ T_av + O2_sat_av + Con_av + COD_av + NH4._av + Nt_av +
                      pool_riffle + meander + netcen + updist,
                      data=environment2, prior="JZS")
plot(bas.model)
```

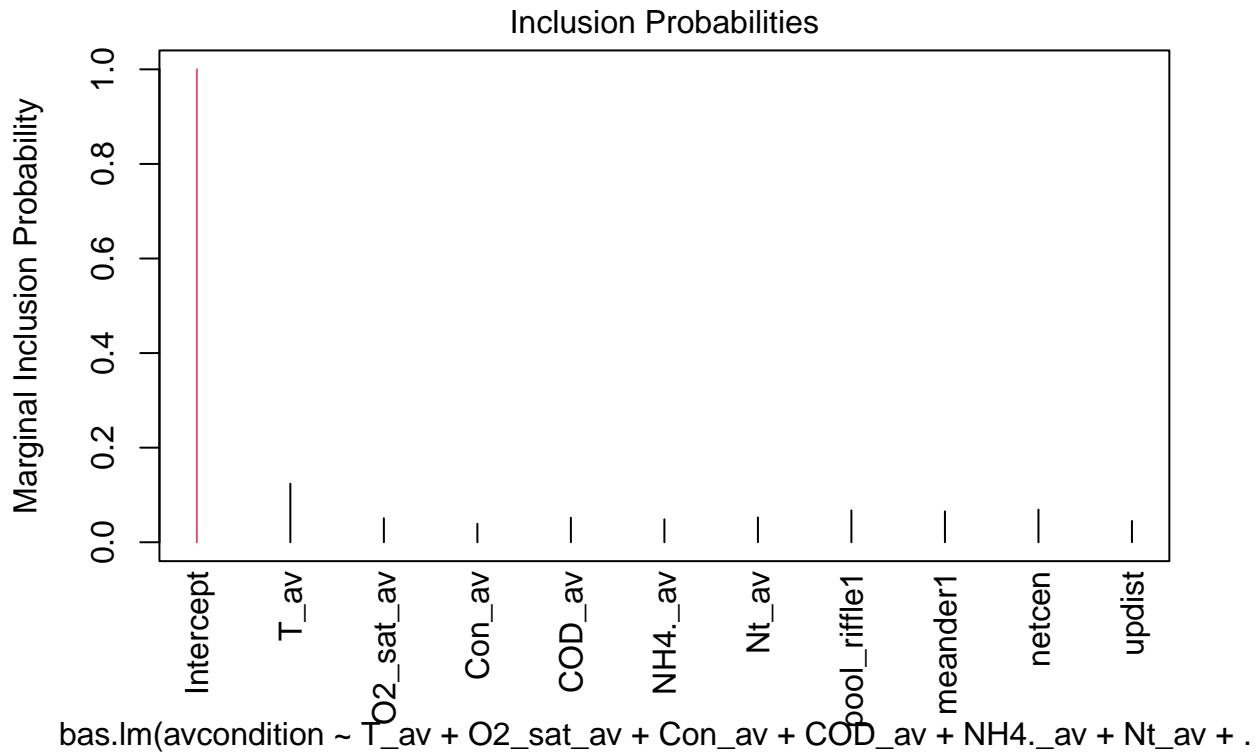


Predictions under BMA

```
bas.lm(avcondition ~ T_av + O2_sat_av + Con_av + COD_av + NH4._av + Nt_av + .
```



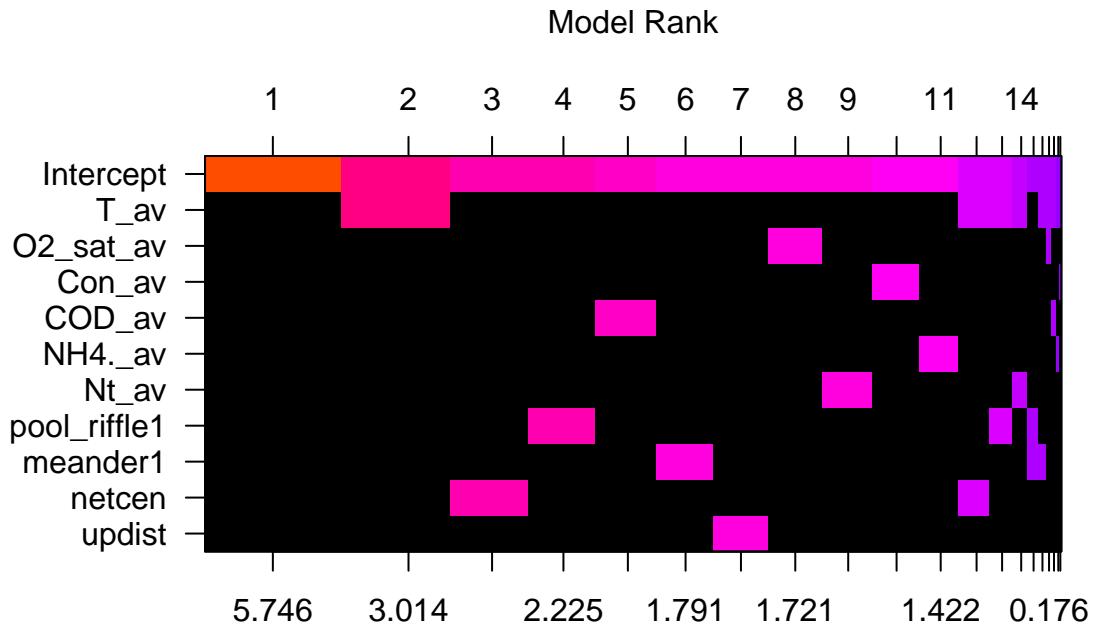




```
summary(bas.model)
```

	P(B != 0 Y)	model 1	model 2	model 3	model 4	model 5
## Intercept	1.00000000	1.0000	1.0000000	1.0000000	1.0000000	1.0000000
## T_av	0.12386945	0.0000	1.0000000	0.0000000	0.0000000	0.0000000
## O2_sat_av	0.05073157	0.0000	0.0000000	0.0000000	0.0000000	0.0000000
## Con_av	0.03919858	0.0000	0.0000000	0.0000000	0.0000000	0.0000000
## COD_av	0.05197281	0.0000	0.0000000	0.0000000	0.0000000	1.0000000
## NH4._av	0.04846220	0.0000	0.0000000	0.0000000	0.0000000	0.0000000
## Nt_av	0.05248386	0.0000	0.0000000	0.0000000	0.0000000	0.0000000
## pool_riffle1	0.06729856	0.0000	0.0000000	0.0000000	1.0000000	0.0000000
## meander1	0.06527705	0.0000	0.0000000	0.0000000	0.0000000	0.0000000
## netcen	0.06898689	0.0000	0.0000000	1.0000000	0.0000000	0.0000000
## updist	0.04496936	0.0000	0.0000000	0.0000000	0.0000000	0.0000000
## BF	NA	1.0000	0.6511099	0.3462387	0.2957714	0.2212089
## PostProbs	NA	0.6912	0.0450000	0.0239000	0.0204000	0.0153000
## R2	NA	0.0000	0.0906000	0.0565000	0.0478000	0.0315000
## dim	NA	1.0000	2.0000000	2.0000000	2.0000000	2.0000000
## logmarg	NA	0.0000	-0.4290769	-1.0606268	-1.2181684	-1.5086476

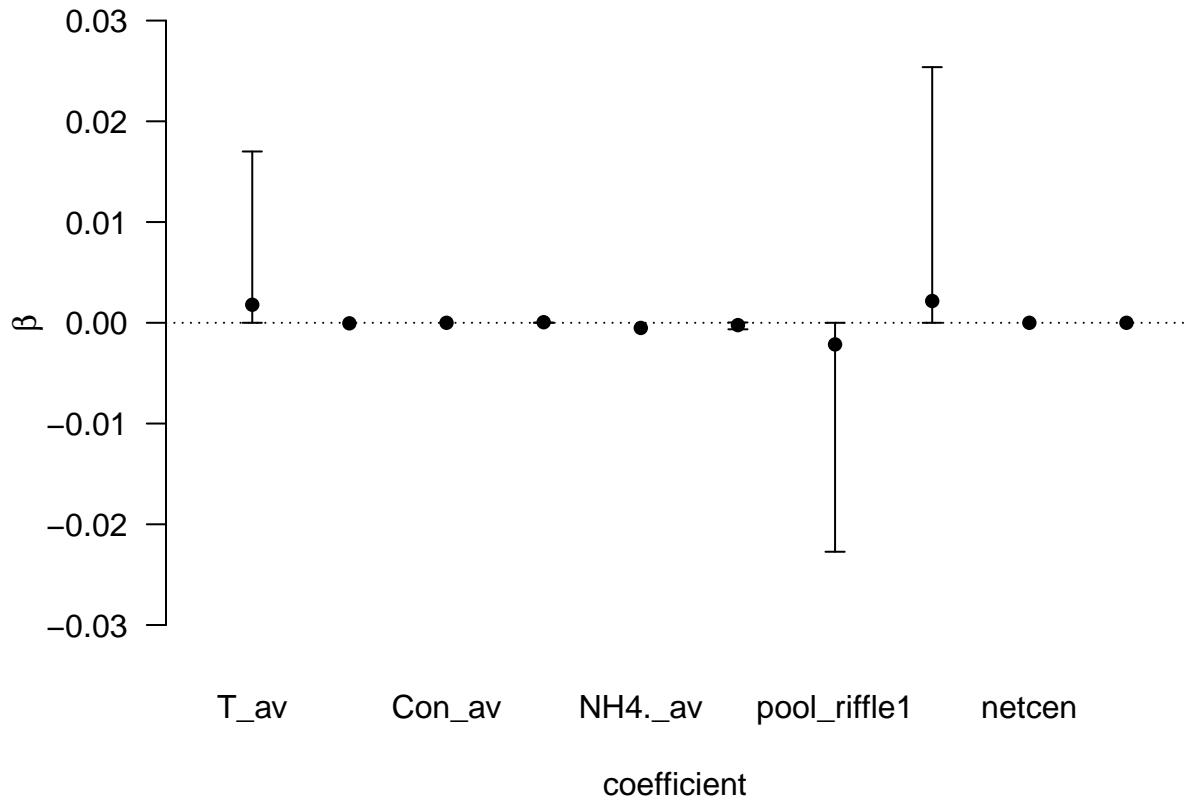
```
image(bas.model, rotate=F)
```



Log Posterior Odds

```
coef.model <- coef(bas.model)
#abs(coef.model$postmean)-2*coef.model$postsd > 0
plot(confint(coef.model, parm = 2:11))
```

```
## Warning in arrows(x[not.deg], ci[not.deg, 1], x[not.deg], ci[not.deg, 2], :
## zero-length arrow is of indeterminate angle and so skipped
```

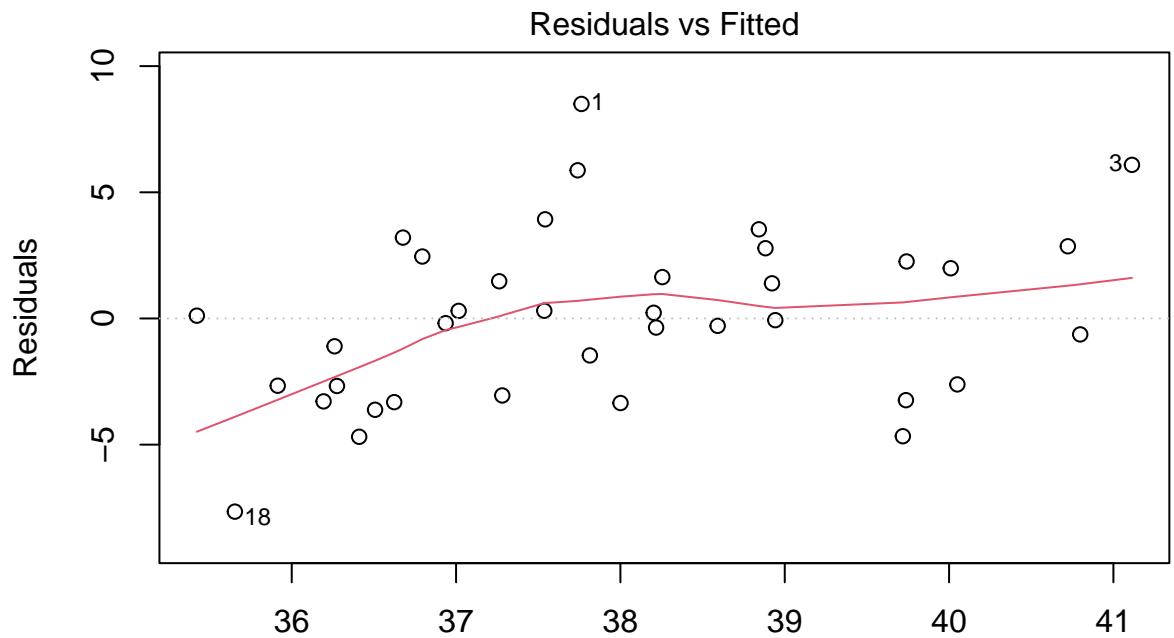


```
## NULL

confint <- confint(coef.model, parm = 2:11)
write.table(confint, 'condition.txt', sep="\t")
pip <- summary(bas.model)
PIP[c(3:12),1] <- pip[2:11,1]*sign(coef.model$postmean[2:11])
#coef.model$postmean[2:11]
```

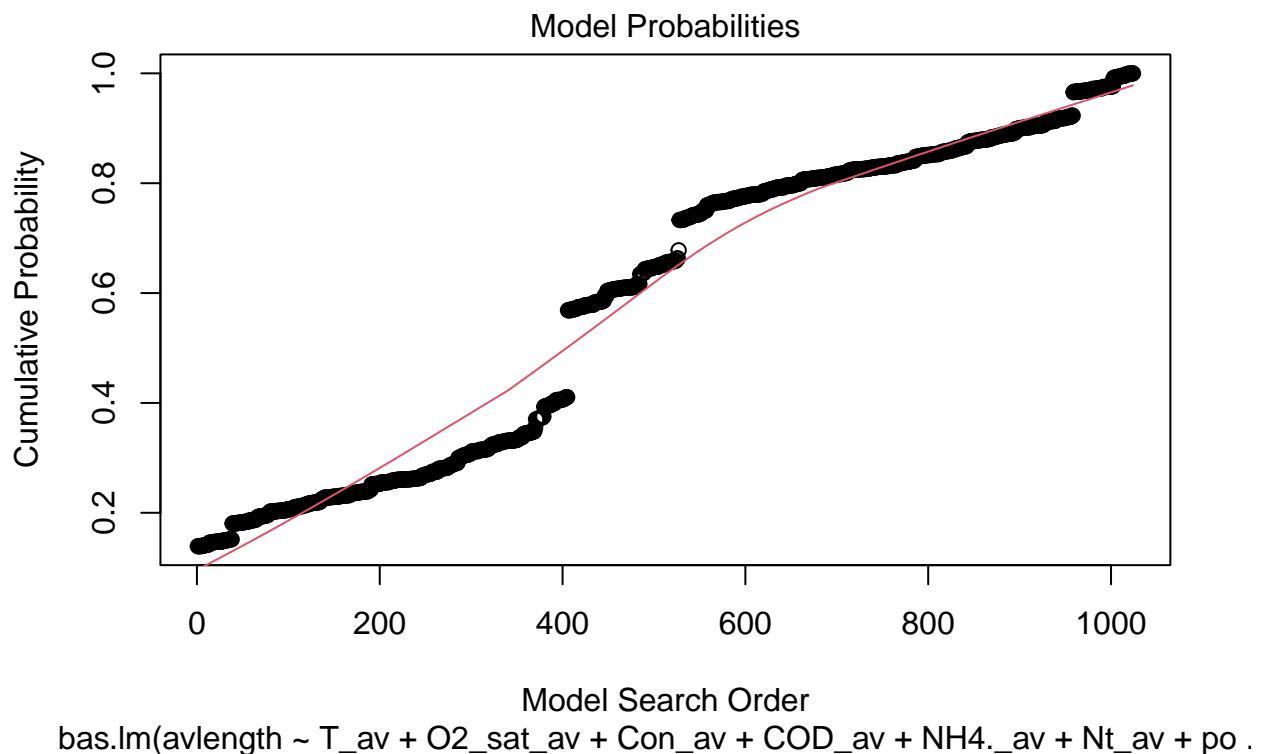
6.2 Variation in host length

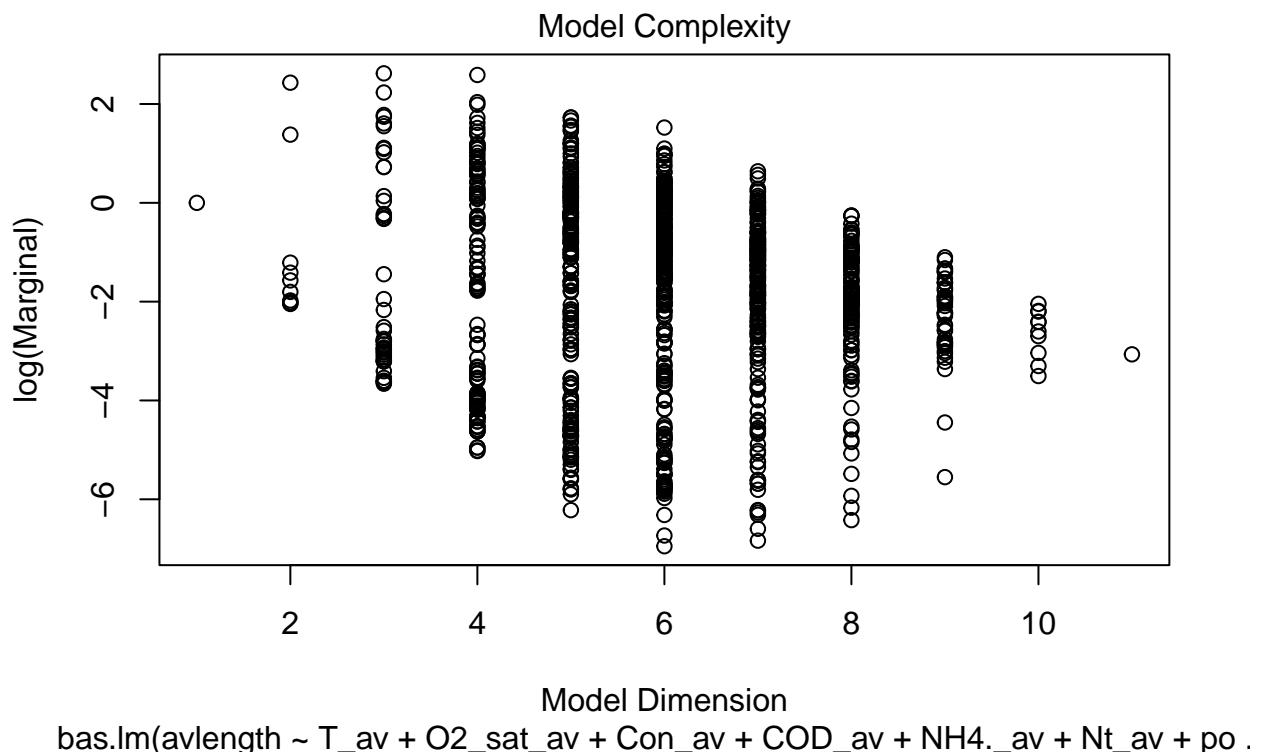
```
bas.model <- bas.lm(avlength ~ T_av + O2_sat_av + Con_av + COD_av + NH4._av + Nt_av +
                      pool_riffle + meander + netcen + updist,
                      data=environment2, prior="JZS")
plot(bas.model)
```

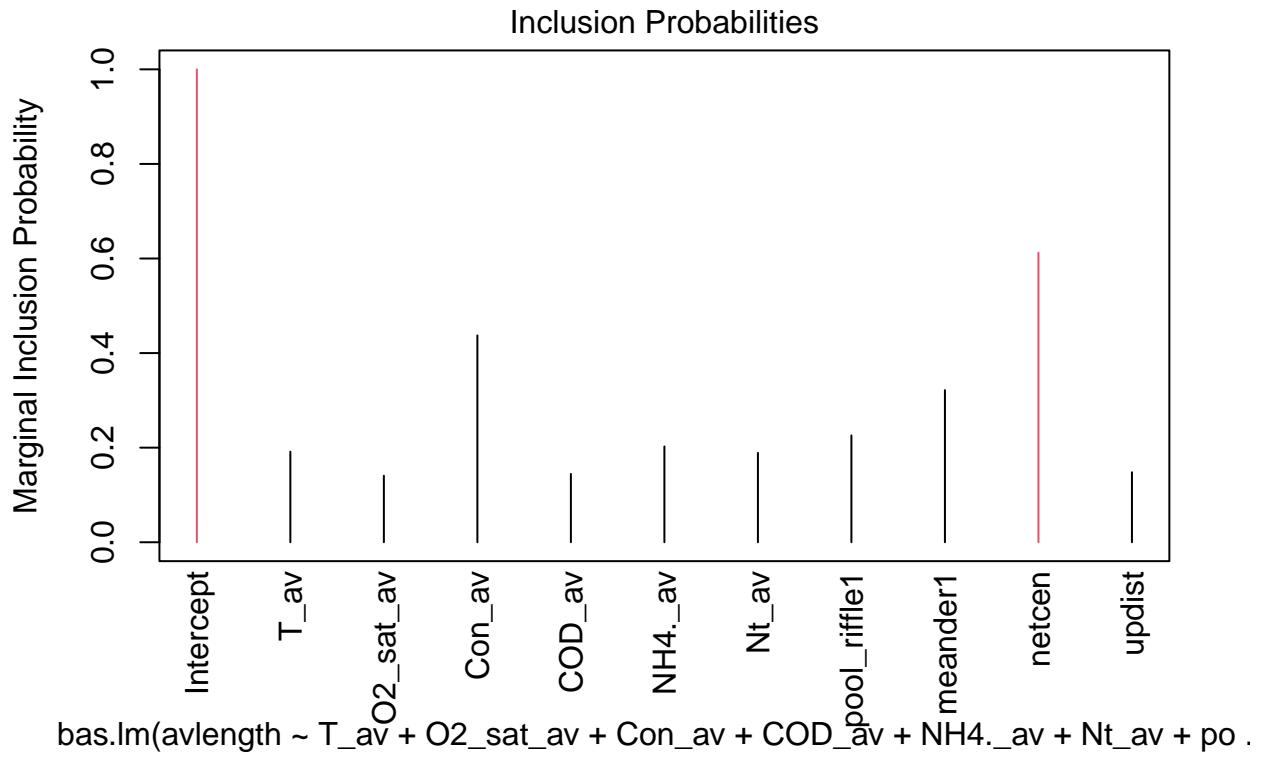


Predictions under BMA

bas.lm(avlength ~ T_av + O2_sat_av + Con_av + COD_av + NH4._av + Nt_av + po .



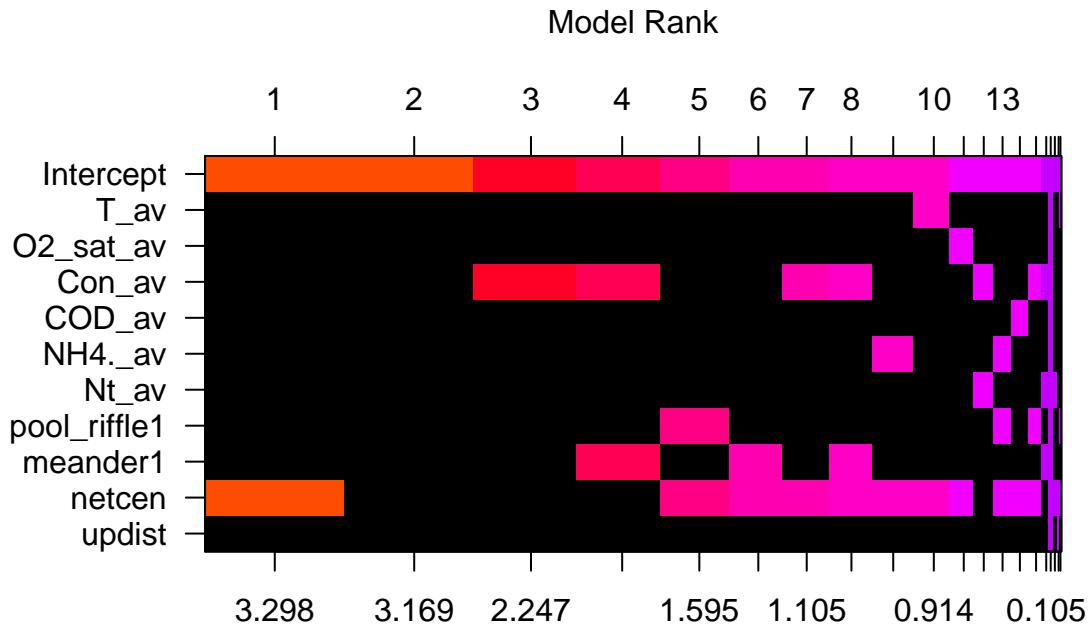




```
summary(bas.model)
```

	P(B != 0 Y)	model 1	model 2	model 3	model 4	model 5
## Intercept	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000
## T_av	0.1914598	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## O2_sat_av	0.1407247	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## Con_av	0.4373524	0.0000000	0.0000000	1.0000000	1.0000000	0.0000000
## COD_av	0.1445232	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## NH4._av	0.2026061	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## Nt_av	0.1889236	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## pool_riffle1	0.2259504	0.0000000	0.0000000	0.0000000	0.0000000	1.0000000
## meander1	0.3217534	0.0000000	0.0000000	0.0000000	1.0000000	0.0000000
## netcen	0.6121912	1.0000000	0.0000000	0.0000000	0.0000000	1.0000000
## updist	0.1480063	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## BF	NA	0.8278694	0.07277547	0.2894406	1.000000	0.6785609
## PostProbs	NA	0.1582000	0.13910000	0.0553000	0.042500	0.0288000
## R2	NA	0.2306000	0.0000000	0.1819000	0.314300	0.2982000
## dim	NA	2.0000000	1.0000000	2.0000000	3.000000	3.0000000
## logmarg	NA	2.4314765	0.0000000	1.3805712	2.620376	2.2325953

```
image(bas.model, rotate=F)
```

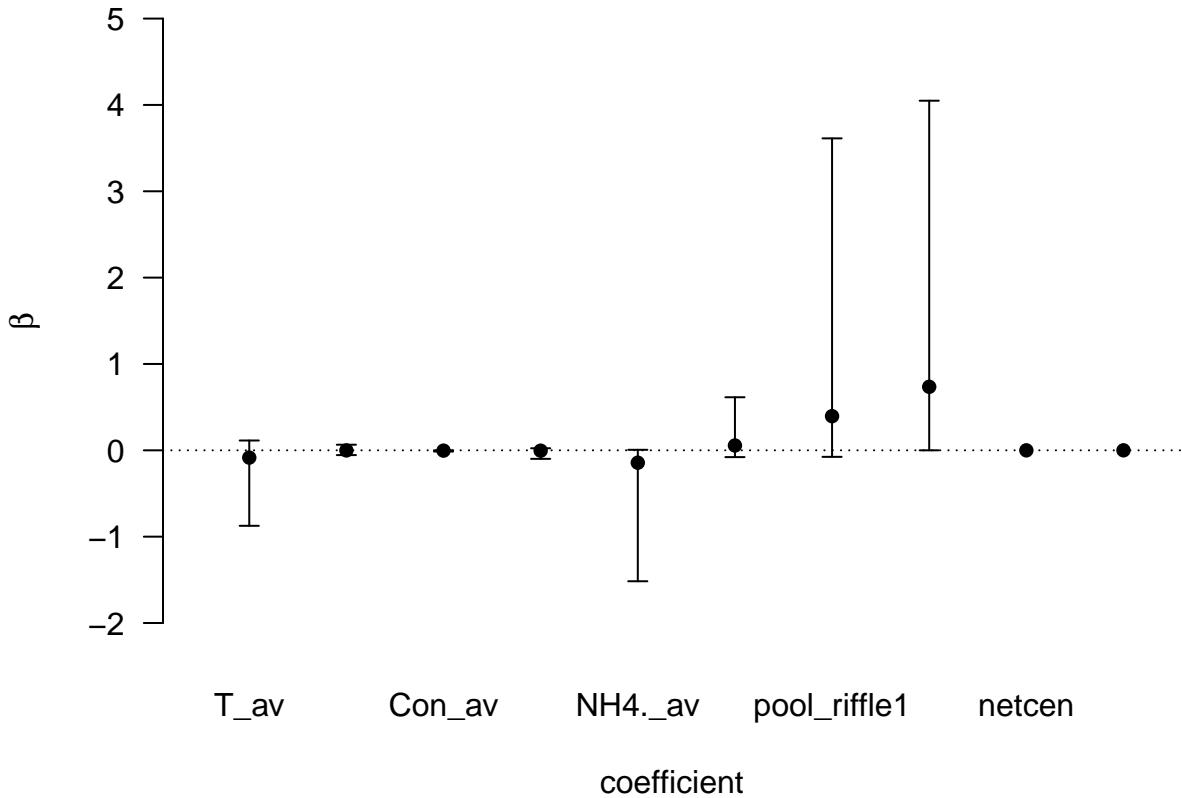


Log Posterior Odds

```
coef.model <- coef(bas.model)
#abs(coef.model$postmean)-2*coef.model$postsd > 0
plot(confint(coef.model, parm = 2:11))
```

```
## Warning in arrows(x[not.deg], ci[not.deg, 1], x[not.deg], ci[not.deg, 2], :
## zero-length arrow is of indeterminate angle and so skipped

## Warning in arrows(x[not.deg], ci[not.deg, 1], x[not.deg], ci[not.deg, 2], :
## zero-length arrow is of indeterminate angle and so skipped
```



```
## NULL
```

```
confint <- confint(coef.model, parm = 2:11)
write.table(confint, 'length.txt', sep="\t")
pip <- summary(bas.model)
PIP[c(3:12),1] <- pip[2:11,1]*sign(coef.model$postmean[2:11])
#coef.model$postmean[2:11]

# Prediction plot
newdata = as.data.frame(cbind(rep(mean(environment2$T_av), 37),
                             rep(mean(environment2$O2_sat_av), 37),
                             rep(mean(environment2$Con_av), 37),
                             rep(mean(environment2$COD_av), 37),
                             rep(mean(environment2$NH4._av), 37),
                             rep(mean(environment2$Nt_av), 37),
                             rep(1, 37),
                             rep(1, 37),
                             rep(mean(netcen), 37),
                             rep(mean(updist), 37)))
colnames(newdata) <- c("T_av", "O2_sat_av", "Con_av", "COD_av", "NH4._av", "Nt_av", "pool_riffle", "meander", "pool_riffle")
newdata[, "pool_riffle"] <- as.factor(newdata[, "pool_riffle"]); newdata[, "meander"] <- as.factor(newdata[, "meander"])
newdata1 <- newdata; newdata1[, "netcen"] <- netcen
BMA <- predict(bas.model, newdata = newdata1, estimator = "BMA", se.fit=TRUE)

png(file="figure.png", res=600, width=3000, height=3000)
```

```

figure_avlenth <- ggplot(environment2, aes(netcen, BMA$fit)) +
  theme_bw() +
  geom_line(color="red", size=1) +
  geom_ribbon(aes(ymin = (BMA$fit-BMA$se.bma.fit), ymax = (BMA$fit+BMA$se.bma.fit)), alpha = .1) +
  geom_point(data = environment2, aes(x=netcen, y=avlenth)) +
  labs(x=expression("Network peripherality [m]"), y=expression("Average host length [mm]")) +
  theme(axis.title.x = element_text(size=12),
        axis.title.y = element_text(size=12)) +  theme(panel.grid.major = element_blank(), panel.grid.minor = element_blank())

```

```

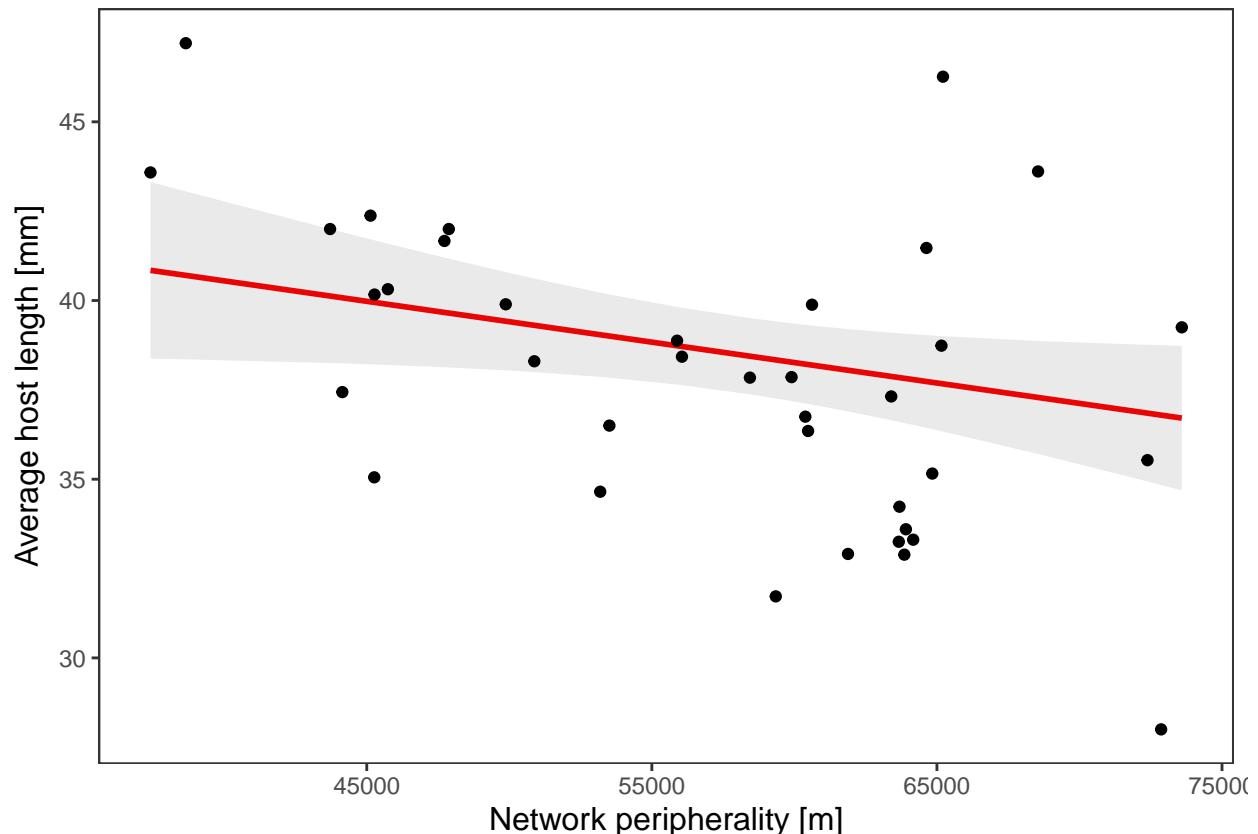
## Warning: Using 'size' aesthetic for lines was deprecated in ggplot2 3.4.0.
## i Please use 'linewidth' instead.

```

```
dev.off()
```

```
## pdf
## 2
```

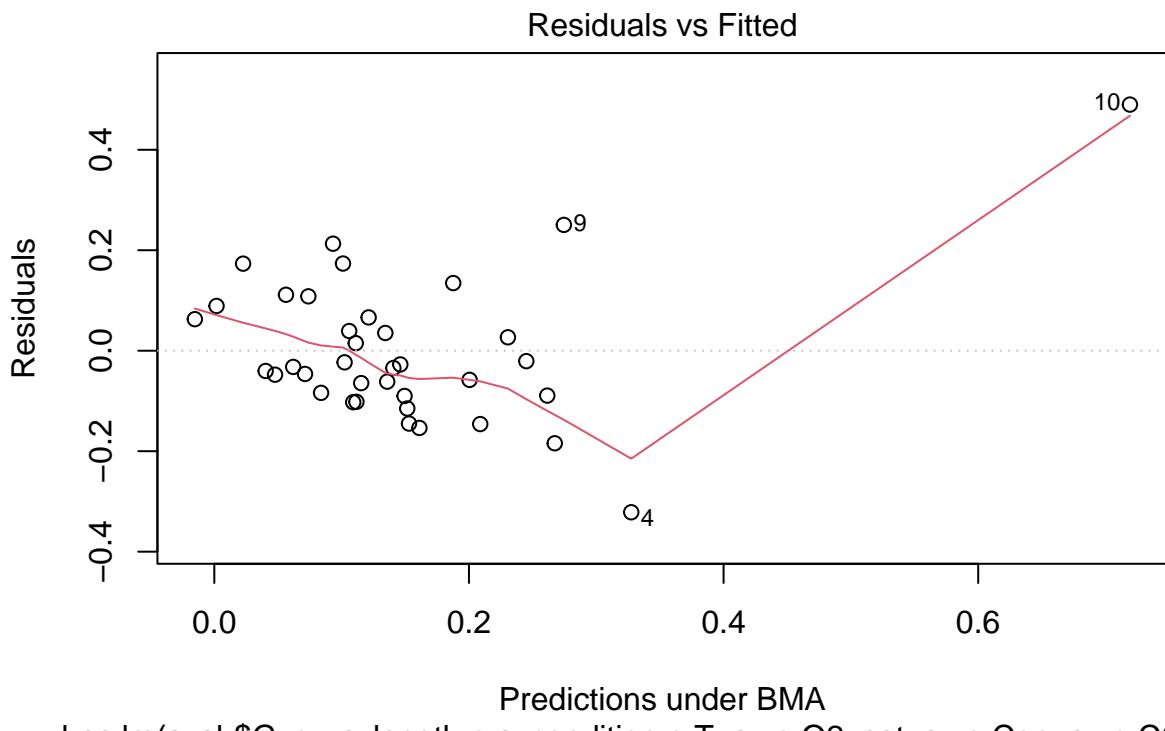
```
figure_avlenth
```

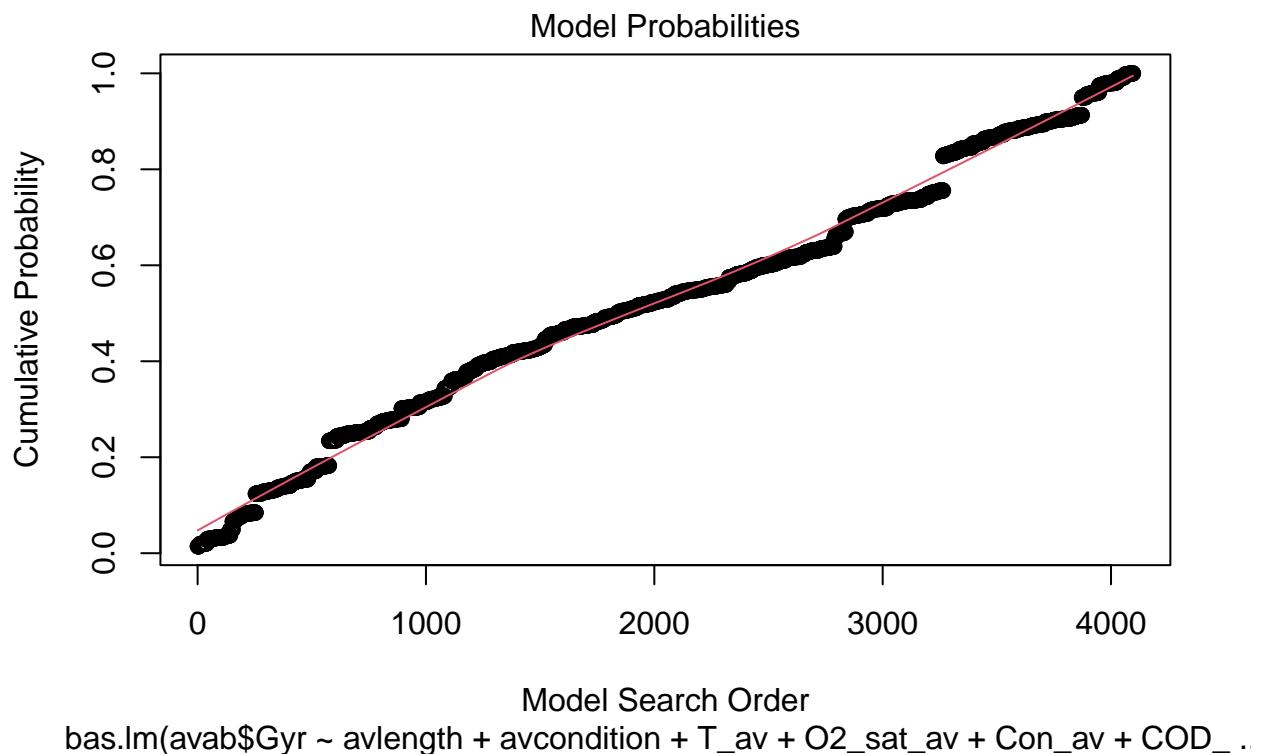


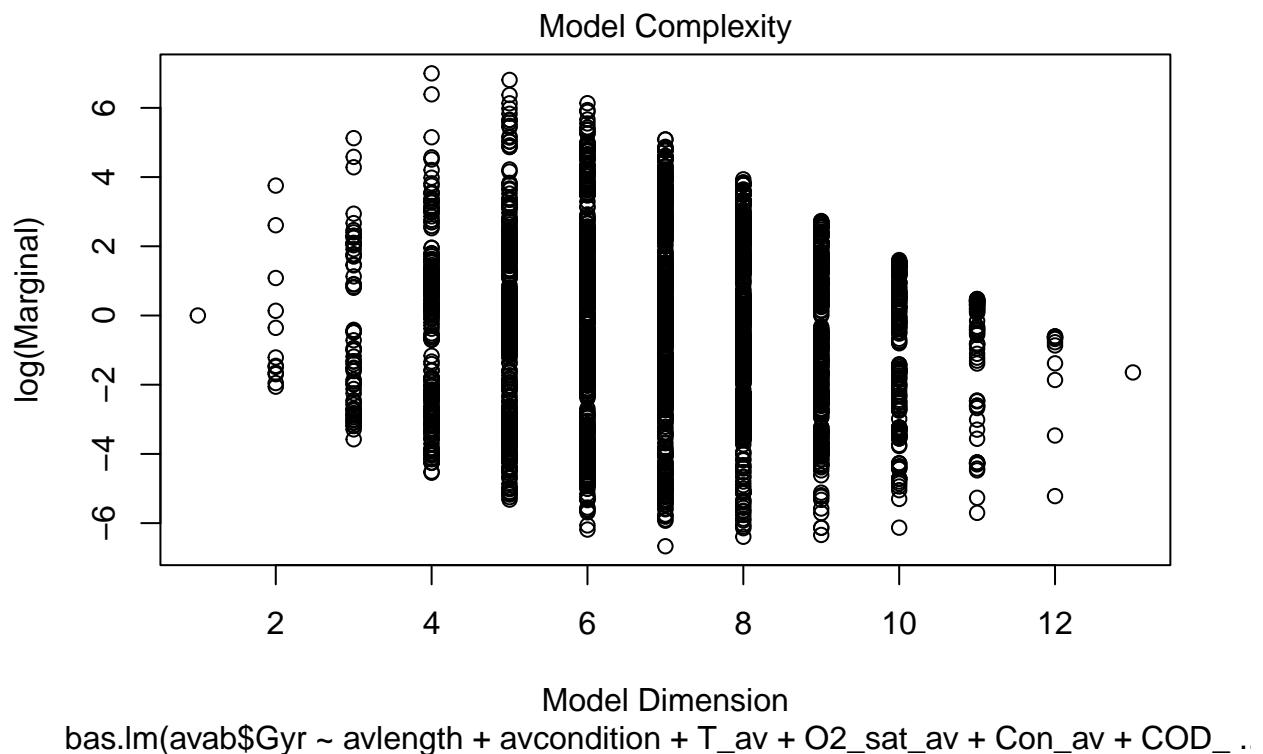
6.3 Variation in Gyrodactylus infection

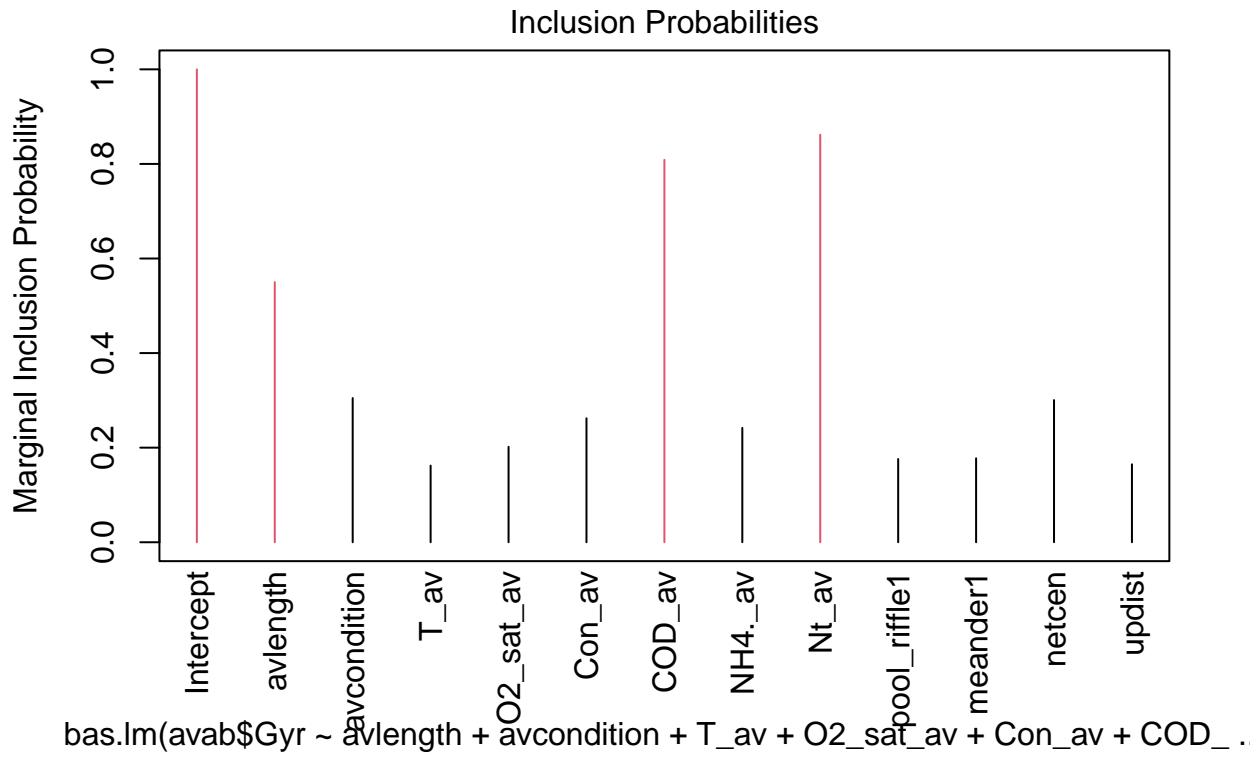
6.3.1 Mean abundance

```
bas.model <- bas.lm(avab$Gyr ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av  
+ NH4_av + Nt_av + pool_riffle + meander + netcen +  
updist, data=environment2, prior="JZS")  
yhat = fitted(bas.model, estimator = "BMA") #these are the fitted values under BMA  
r = bas.model$Y - yhat #these are the model residuals  
plot(bas.model)
```





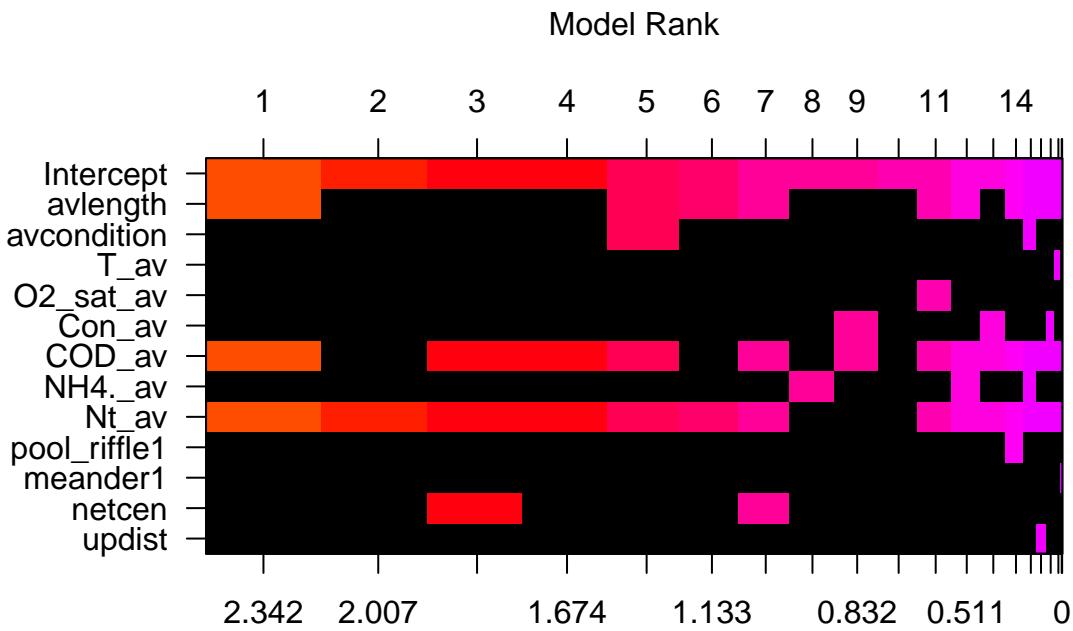




```
summary(bas.model)
```

	P(B != 0 Y)	model 1	model 2	model 3	model 4	model 5
## Intercept	1.0000000	1.000000	1.00000000	1.0000000	1.0000000	1.0000000
## avlength	0.5500651	1.000000	0.00000000	0.0000000	0.0000000	1.0000000
## avcondition	0.3049274	0.000000	0.00000000	0.0000000	0.0000000	1.0000000
## T_av	0.1620852	0.000000	0.00000000	0.0000000	0.0000000	0.0000000
## O2_sat_av	0.2017699	0.000000	0.00000000	0.0000000	0.0000000	0.0000000
## Con_av	0.2621665	0.000000	0.00000000	0.0000000	0.0000000	0.0000000
## COD_av	0.8086300	1.000000	0.00000000	1.0000000	1.0000000	1.0000000
## NH4_av	0.2417809	0.000000	0.00000000	0.0000000	0.0000000	0.0000000
## Nt_av	0.8618345	1.000000	1.00000000	1.0000000	1.0000000	1.0000000
## pool_riffle1	0.1760484	0.000000	0.00000000	0.0000000	0.0000000	0.0000000
## meander1	0.1775842	0.000000	0.00000000	0.0000000	0.0000000	0.0000000
## netcen	0.3006370	0.000000	0.00000000	1.0000000	0.0000000	0.0000000
## updist	0.1648814	0.000000	0.00000000	0.0000000	0.0000000	0.0000000
## BF	NA	1.000000	0.03902505	0.5452757	0.1537678	0.8271829
## PostProbs	NA	0.072100	0.05160000	0.0393000	0.0369000	0.0265000
## R2	NA	0.524000	0.28790000	0.5059000	0.4100000	0.5631000
## dim	NA	4.000000	2.00000000	4.0000000	3.0000000	5.0000000
## logmarg	NA	6.997337	3.75378552	6.3908733	5.1250253	6.8076077

```
image(bas.model, rotate=F)
```



Log Posterior Odds

```
coef.model <- coef(bas.model)
abs(coef.model$postmean)-2*coef.model$postsd > 0
```

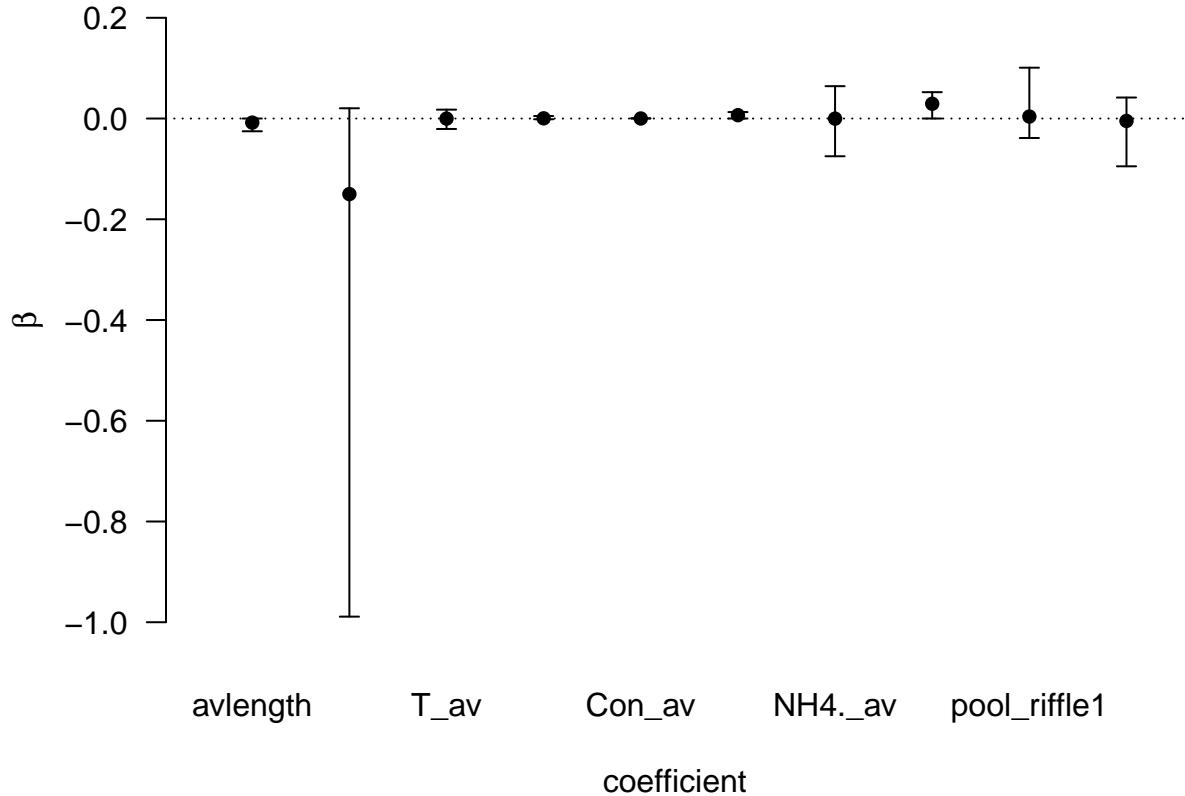
```
## [1] TRUE FALSE FALSE
## [13] FALSE
```

```
confint(coef.model)
```

```
##              2.5%      97.5%      beta
## Intercept  9.146829e-02 2.007301e-01 1.489134e-01
## avlength   -2.529834e-02 5.965905e-05 -8.122675e-03
## avcondition -1.013447e+00 1.446010e-02 -1.500326e-01
## T_av        -2.151376e-02 1.672004e-02 -1.493132e-04
## O2_sat_av  -1.070501e-03 5.641434e-03  3.794809e-04
## Con_av     -1.238097e-04 4.813171e-04  5.726233e-05
## COD_av      0.000000e+00 1.298327e-02  6.652983e-03
## NH4._av    -6.770004e-02 7.055473e-02 -1.888173e-04
## Nt_av       0.000000e+00 5.204910e-02  2.930918e-02
## pool_riffle1 -4.631795e-02 1.000326e-01  3.966550e-03
## meander1   -1.065825e-01 3.293118e-02 -4.806259e-03
## netcen     -7.355069e-07 9.648504e-06  1.332021e-06
## updist     -1.217559e-06 1.872739e-06  4.618571e-08
## attr(),"Probability")
## [1] 0.95
## attr(),"class")
```

```
## [1] "confint.bas"

plot(confint(coef.model, parm = 2:11))
```



```
## NULL

confint <- confint(coef.model, parm = 2:11)
write.table(confint, 'GyroAA.txt', sep="\t")
pip <- summary(bas.model)
PIP[c(1:12),3] <- pip[2:13,1]*sign(coef.model$postmean[2:13])
```

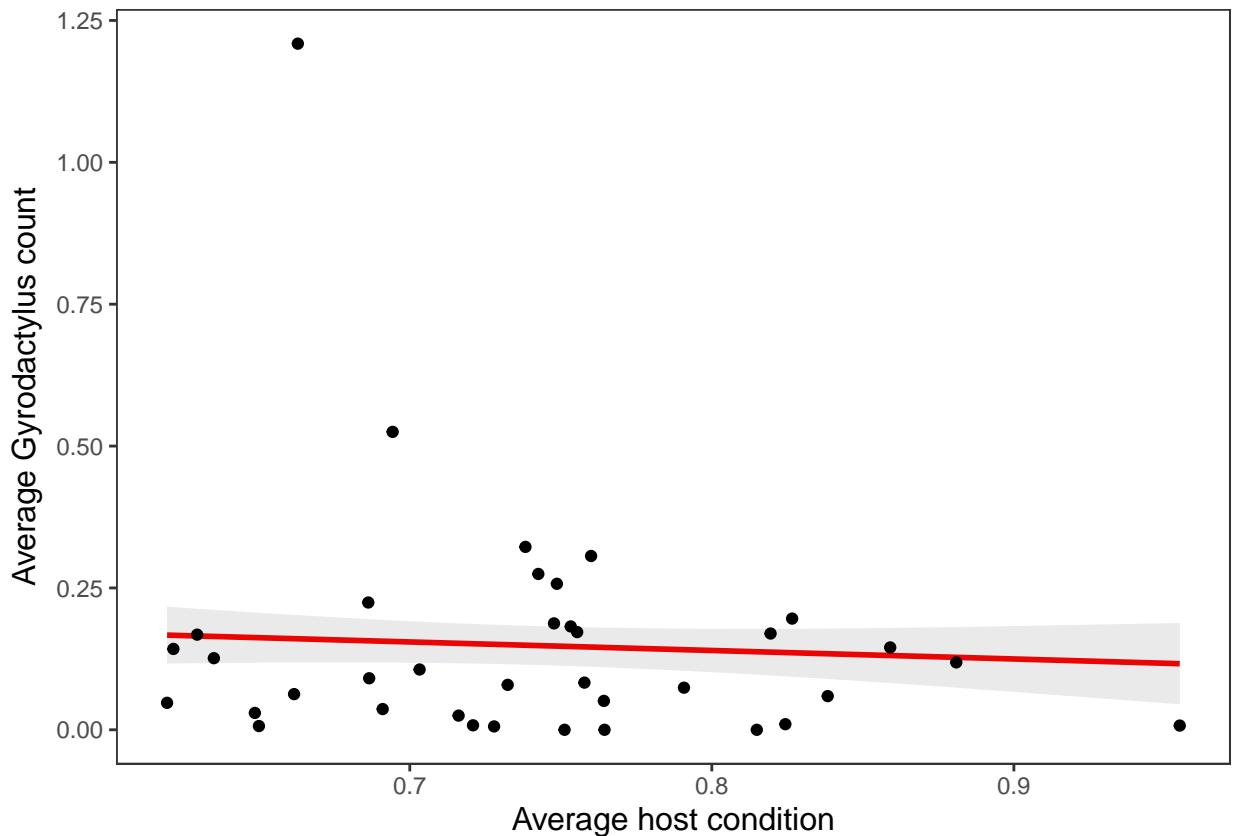
6.3.1.1 Prediction plot for marginal effect of host condition on average Gyrodactylus infection

```
# Prediction plot
newdata = as.data.frame(cbind(rep(mean(avlength), 37),
                             rep(mean(avcondition), 37),
                             rep(mean(environment2$T_av), 37),
                             rep(mean(environment2$O2_sat_av), 37),
                             rep(mean(environment2$Con_av), 37),
                             rep(mean(environment2$COD_av), 37),
```

```

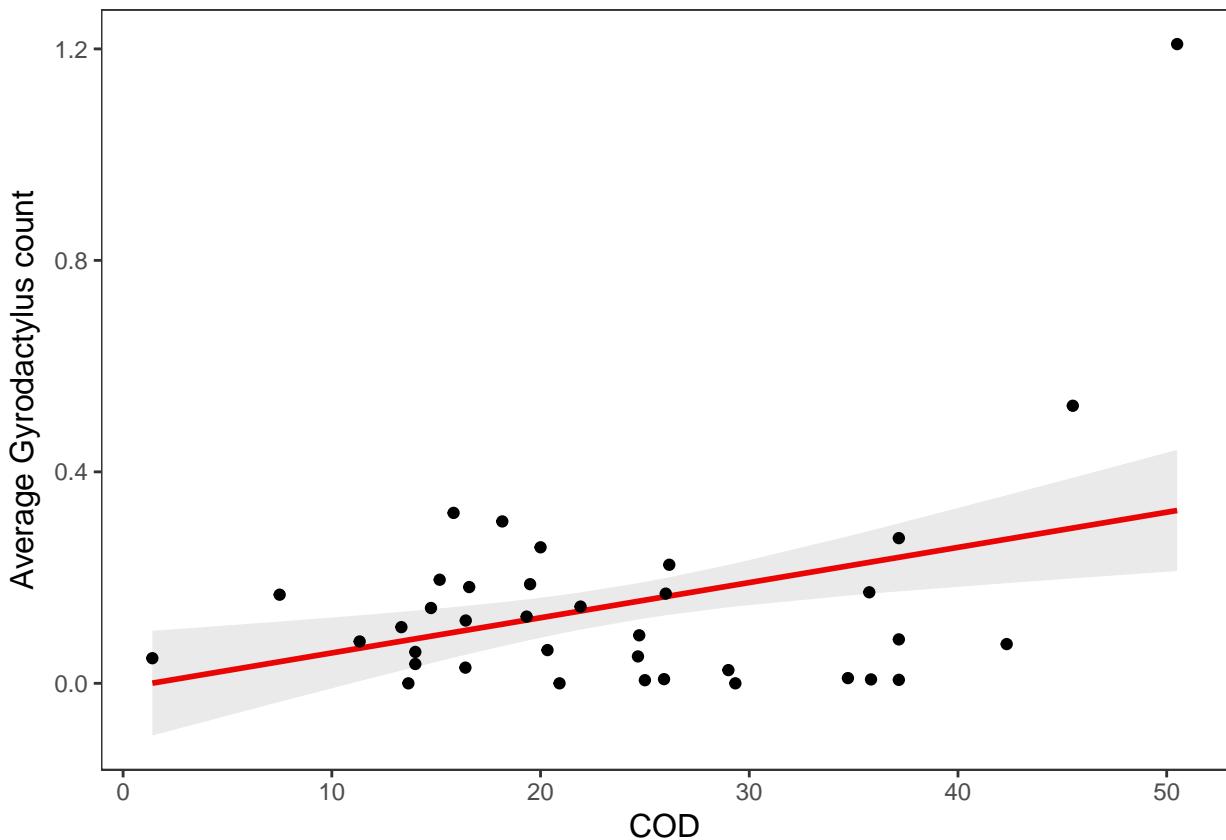
rep(mean(environment2$NH4._av), 37),
rep(mean(environment2$Nt_av), 37),
rep(1, 37),
rep(1, 37),
rep(mean(netcen), 37),
rep(mean(updist), 37)))
colnames(newdata) <- c("avlength", "avcondition", "T_av", "O2_sat_av", "Con_av", "COD_av", "NH4._av", "T")
newdata[,"pool_riffle"] <- as.factor(newdata[,"pool_riffle"]); newdata[,"meander"] <- as.factor(newdata[,"meander"])
newdata1 <- newdata; newdata1[, "avcondition"] <- avcondition
BMA <- predict(bas.model, newdata = newdata1, estimator = "BMA", se.fit=TRUE)
ggplot(environment2, aes(avcondition, BMA$fit)) +
  theme_bw() +
  geom_line(color="red", size=1) +
  geom_ribbon(aes(ymin = (BMA$fit-BMA$se.bma.fit), ymax = (BMA$fit+BMA$se.bma.fit)), alpha = .1) +
  geom_point(data = environment2, aes(x=avcondition, y=avab$Gyr)) +
  labs(x=expression("Average host condition"), y=expression("Average Gyrodactylus count")) +
  theme(axis.title.x = element_text(size=12),
        axis.title.y = element_text(size=12)) + theme(panel.grid.major = element_blank(), panel.grid.minor = element_blank())

```



6.3.1.2 Prediction plot for marginal effect of COD on average Gyrodactylus infection

```
newdata1 <- newdata; newdata1[, "COD_av"] <- environment2$COD_av
BMA <- predict(bas.model, newdata = newdata1, estimator = "BMA", se.fit=TRUE)
ggplot(environment2, aes(COD_av, BMA$fit)) +
  theme_bw() +
  geom_line(color="red", size=1) +
  geom_ribbon(aes(ymin = (BMA$fit-BMA$se.bma.fit), ymax = (BMA$fit+BMA$se.bma.fit)), alpha = .1) +
  geom_point(data = environment2, aes(x=COD_av, y=avab$Gyr)) +
  labs(x=expression("COD"), y=expression("Average Gyrodactylus count")) +
  theme(axis.title.x = element_text(size=12),
        axis.title.y = element_text(size=12)) +  theme(panel.grid.major = element_blank(), panel.grid.m
```



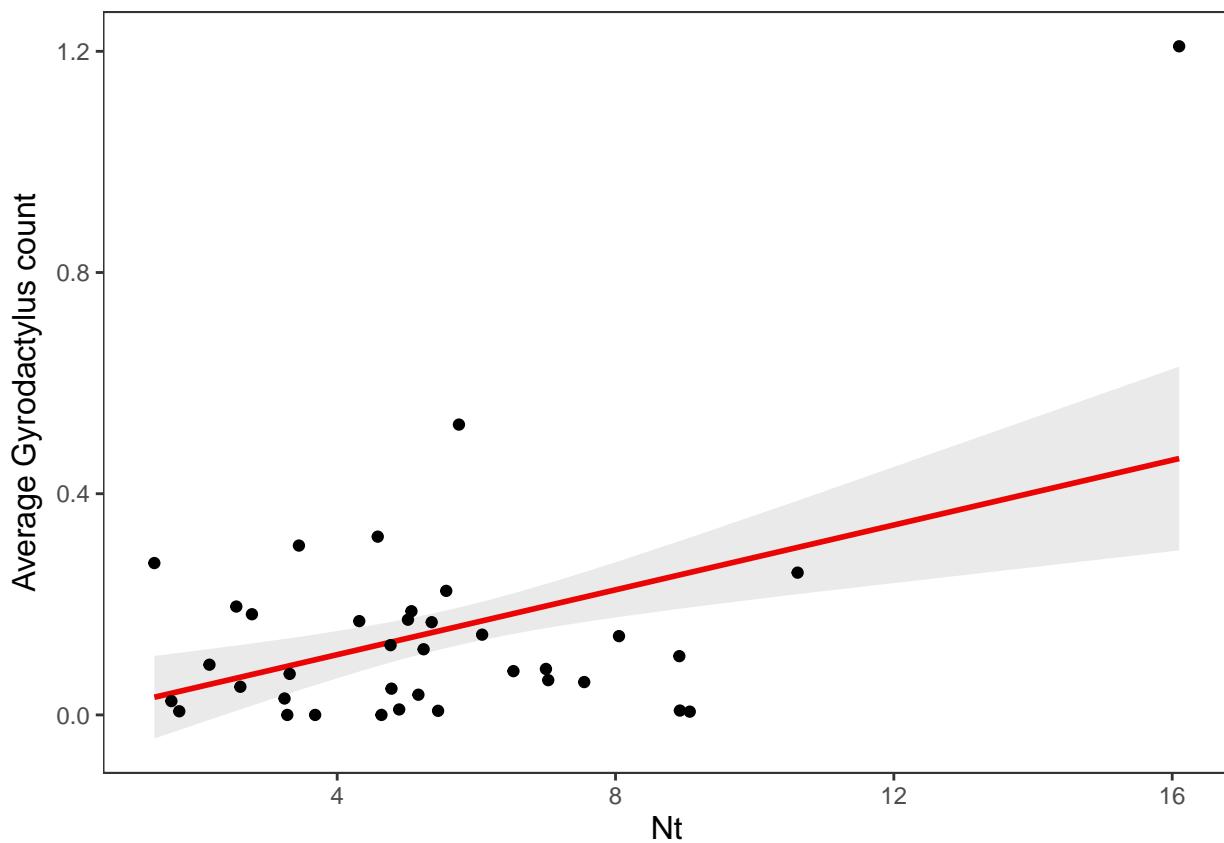
6.3.2.3 Prediction plot for marginal effect of total nitrogen on average Gyrodactylus infection

```
newdata1 <- newdata; newdata1[, "Nt_av"] <- environment2$Nt_av
BMA <- predict(bas.model, newdata = newdata1, estimator = "BMA", se.fit=TRUE)
ggplot(environment2, aes(Nt_av, BMA$fit)) +
```

```

theme_bw() +
geom_line(color="red", size=1) +
geom_ribbon(aes(ymin = (BMA$fit-BMA$se.bma.fit), ymax = (BMA$fit+BMA$se.bma.fit)), alpha = .1) +
geom_point(data = environment2, aes(x=Nt_av, y=avab$Gyr)) +
labs(x=expression("Nt"), y=expression("Average Gyrodactylus count")) +
theme(axis.title.x = element_text(size=12),
      axis.title.y = element_text(size=12)) + theme(panel.grid.major = element_blank(), panel.grid.minor = element_blank())

```



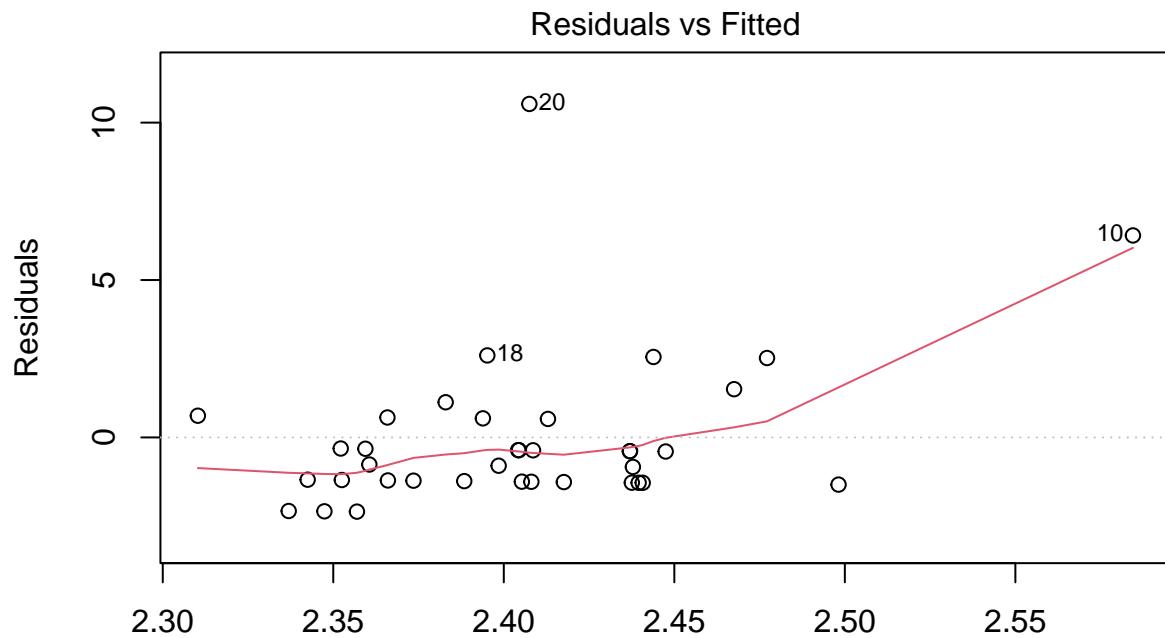
6.3.2 Median infection intensity

```

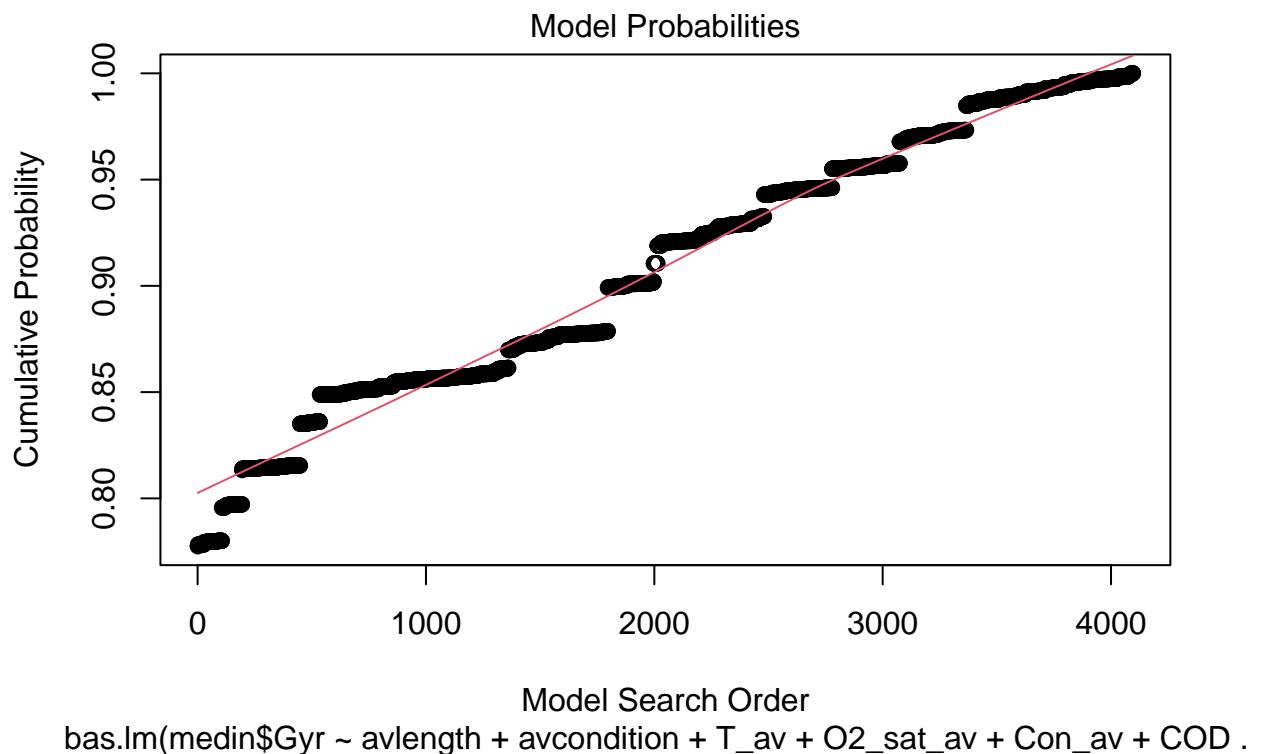
bas.model <- bas.lm(medin$Gyr ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
                     + NH4_av + Nt_av + pool_riffle + meander + netcen +
                     updist, data=environment2, prior="JZS")
yhat = fitted(bas.model, estimator = "BMA") #these are the fitted values under BMA
r = bas.model$Y - yhat #these are the model residuals

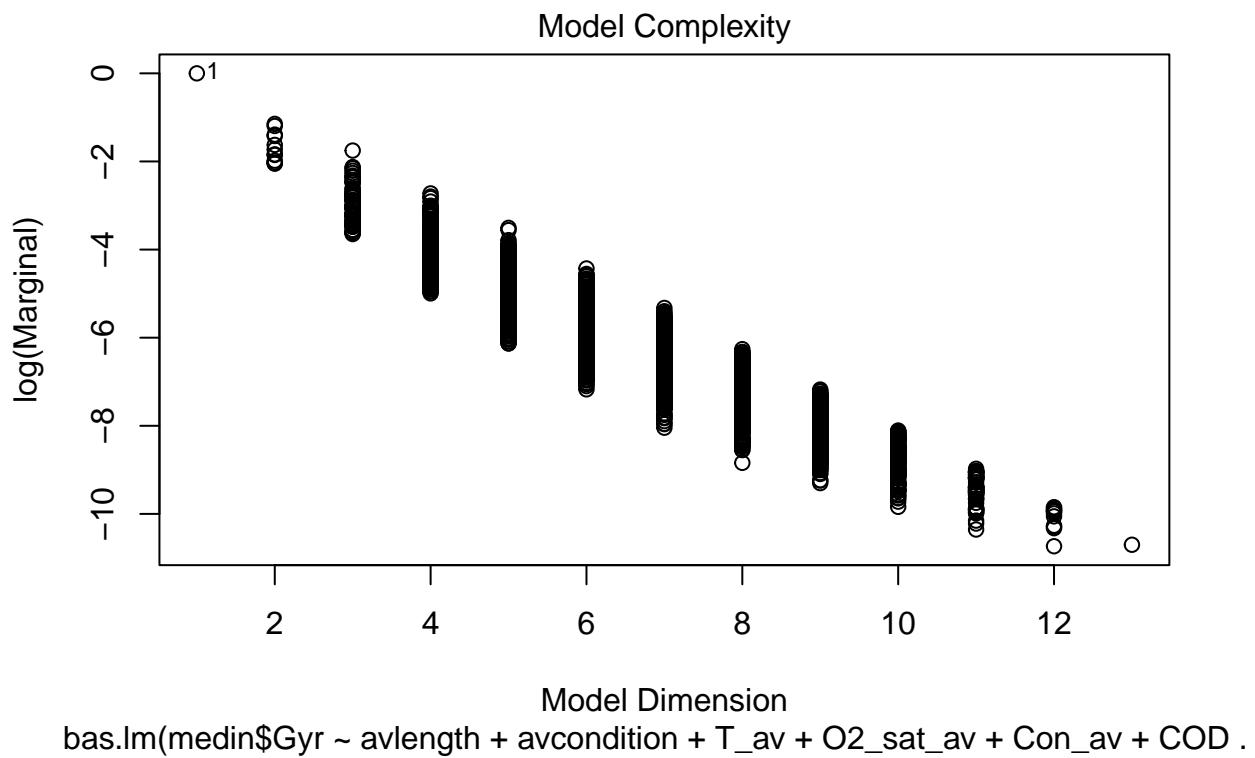
plot(bas.model)

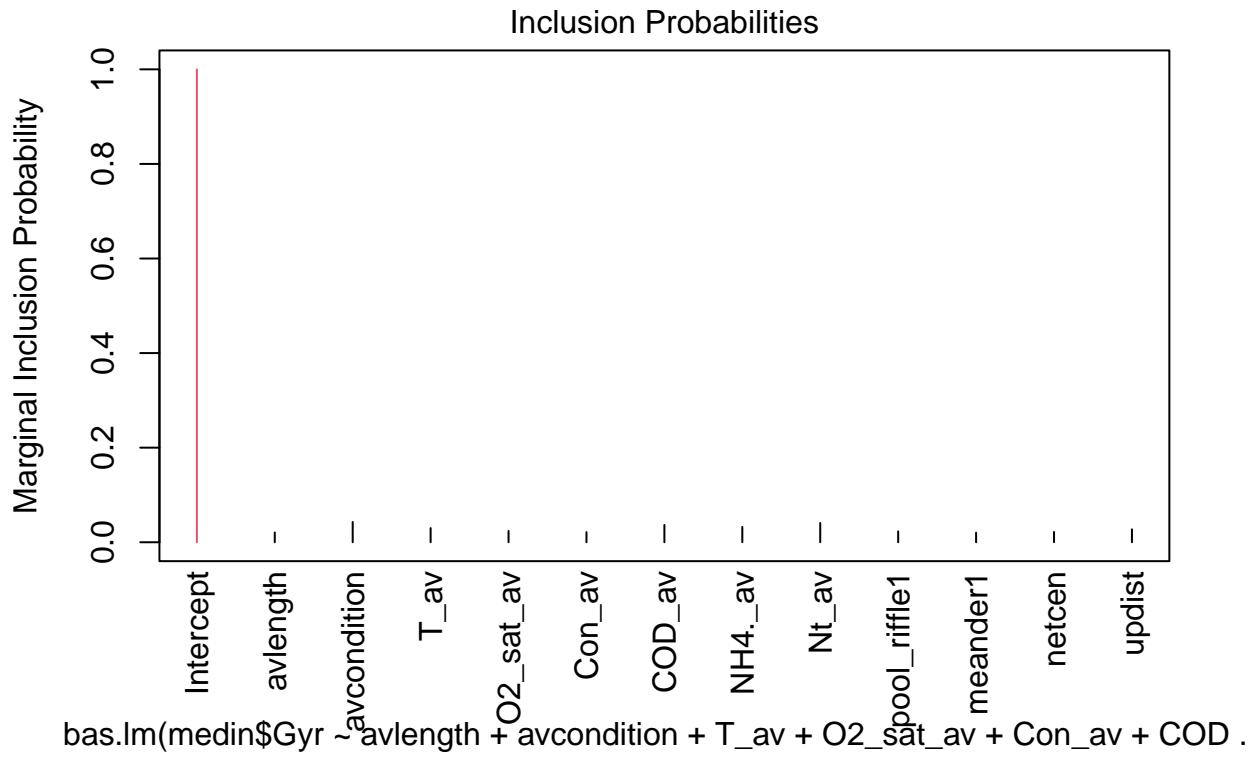
```



Predictions under BMA
bas.lm(medin\$Gyr ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD .



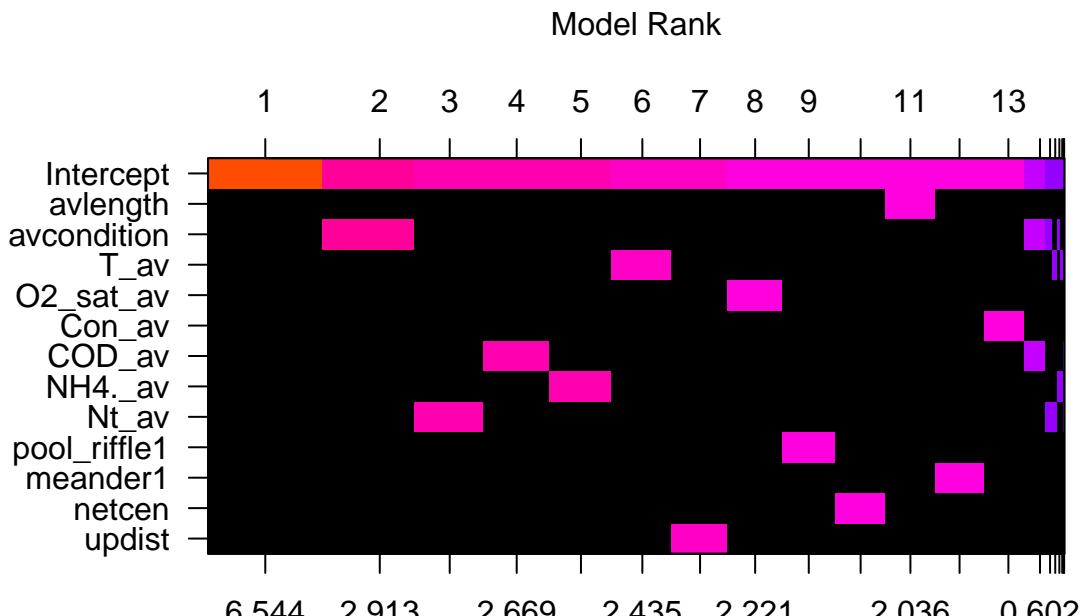




```
summary(bas.model)
```

	P(B != 0 Y)	model 1	model 2	model 3	model 4	model 5
## Intercept	1.00000000	1.0000	1.0000000	1.000000	1.0000000	1.0000000
## avlength	0.02065469	0.0000	0.0000000	0.000000	0.0000000	0.0000000
## avcondition	0.04286905	0.0000	1.0000000	0.000000	0.0000000	0.0000000
## T_av	0.02991678	0.0000	0.0000000	0.000000	0.0000000	0.0000000
## O2_sat_av	0.02400544	0.0000	0.0000000	0.000000	0.0000000	0.0000000
## Con_av	0.02143314	0.0000	0.0000000	0.000000	0.0000000	0.0000000
## COD_av	0.03655302	0.0000	0.0000000	0.000000	1.0000000	0.0000000
## NH4_av	0.03250611	0.0000	0.0000000	0.000000	0.0000000	1.0000000
## Nt_av	0.04088810	0.0000	0.0000000	1.000000	0.0000000	0.0000000
## pool_riffle1	0.02307275	0.0000	0.0000000	0.000000	0.0000000	0.0000000
## meander1	0.02038443	0.0000	0.0000000	0.000000	0.0000000	0.0000000
## netcen	0.02173649	0.0000	0.0000000	0.000000	0.0000000	0.0000000
## updist	0.02738794	0.0000	0.0000000	0.000000	0.0000000	0.0000000
## BF	NA	1.0000	0.3176354	0.302852	0.2488803	0.2411373
## PostProbs	NA	0.7775	0.0206000	0.019600	0.0161000	0.0156000
## R2	NA	0.0000	0.0517000	0.049100	0.0381000	0.0363000
## dim	NA	1.0000	2.0000000	2.000000	2.0000000	2.0000000
## logmarg	NA	0.0000	-1.1468512	-1.194511	-1.3907833	-1.4223890

```
image(bas.model, rotate=F)
```



```

coef.model <- coef(bas.model)
abs(coef.model$postmean)-2*coef.model$postsd > 0

## [1] TRUE FALSE FALSE
## [13] FALSE

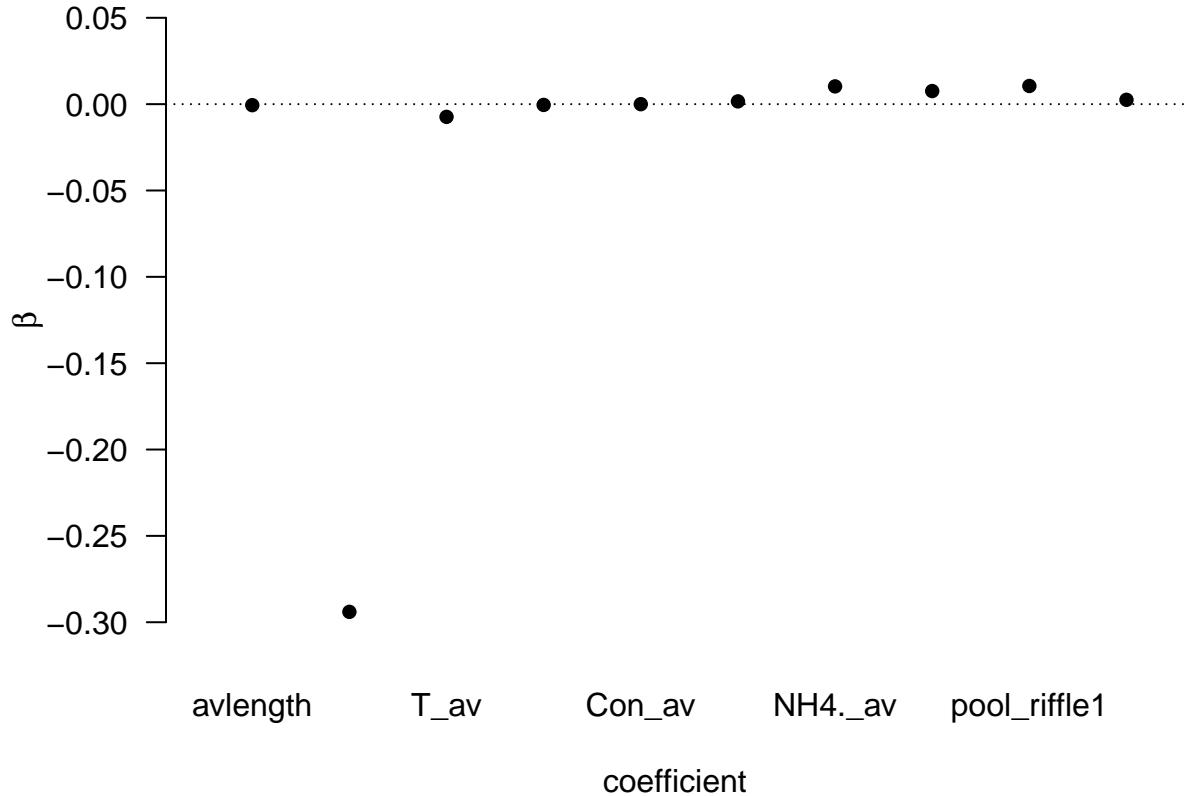
confint(coef.model)

##              2.5%    97.5%      beta
## Intercept  1.558312 3.221588 2.405405e+00
## avlength   0.000000 0.000000 -5.938396e-04
## avcondition 0.000000 0.000000 -2.939823e-01
## T_av       0.000000 0.000000 -7.368692e-03
## O2_sat_av  0.000000 0.000000 -4.581964e-04
## Con_av     0.000000 0.000000 -1.594570e-05
## COD_av     0.000000 0.000000 1.609035e-03
## NH4_.av    0.000000 0.000000 1.027436e-02
## Nt_av      0.000000 0.000000 7.570653e-03
## pool_riffle1 0.000000 0.000000 1.051497e-02
## meander1   0.000000 0.000000 2.511911e-03
## netcen     0.000000 0.000000 3.990331e-07
## updist     0.000000 0.000000 4.560731e-07
## attr(),"Probability")
## [1] 0.95
## attr(),"class")

```

```
## [1] "confint.bas"

plot(confint(coef.model, parm = 2:11))
```



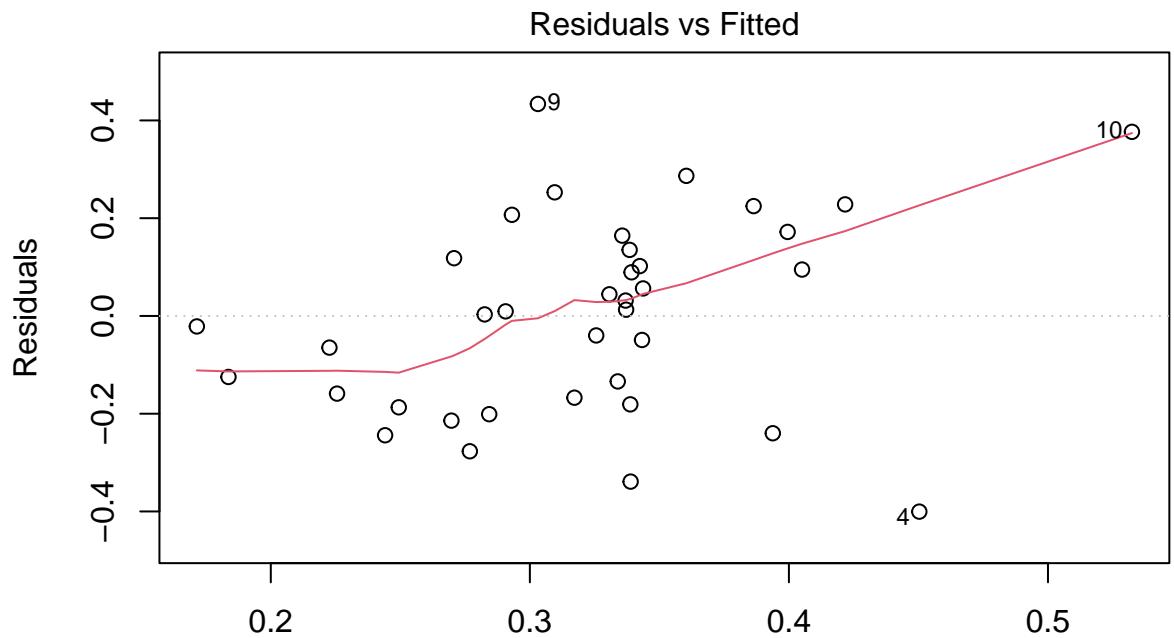
```
## NULL

confint <- confint(coef.model, parm = 2:11)
write.table(confint, 'GyroAA.txt', sep="\t")
pip <- summary(bas.model)
PIP[c(1:12),3] <- pip[2:13,1]*sign(coef.model$postmean[2:13])
```

6.3.2 Prevalence

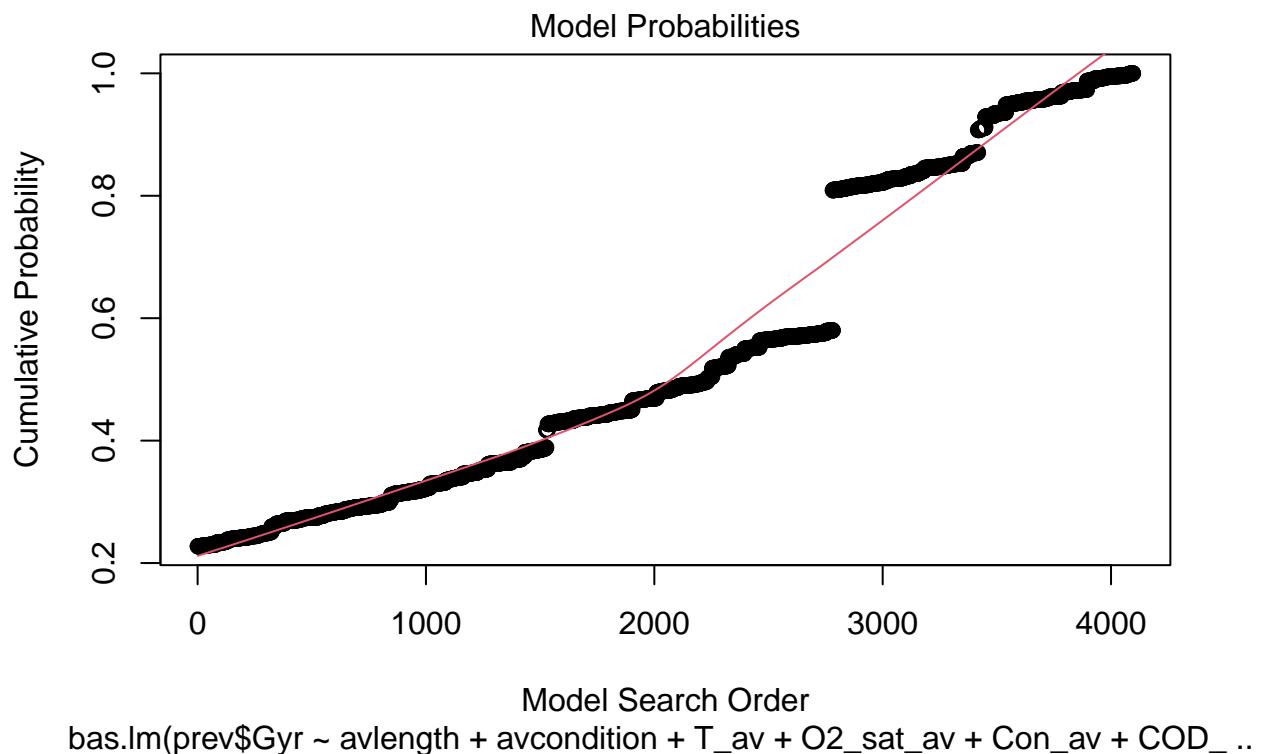
```
bas.model <- bas.lm(prev$Gyr ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
+ NH4._av + Nt_av + pool_riffle + meander + netcen +
updist, data=environment2, prior="JZS")
yhat = fitted(bas.model, estimator = "BMA") #these are the fitted values under BMA
r = bas.model$Y - yhat #these are the model residuals

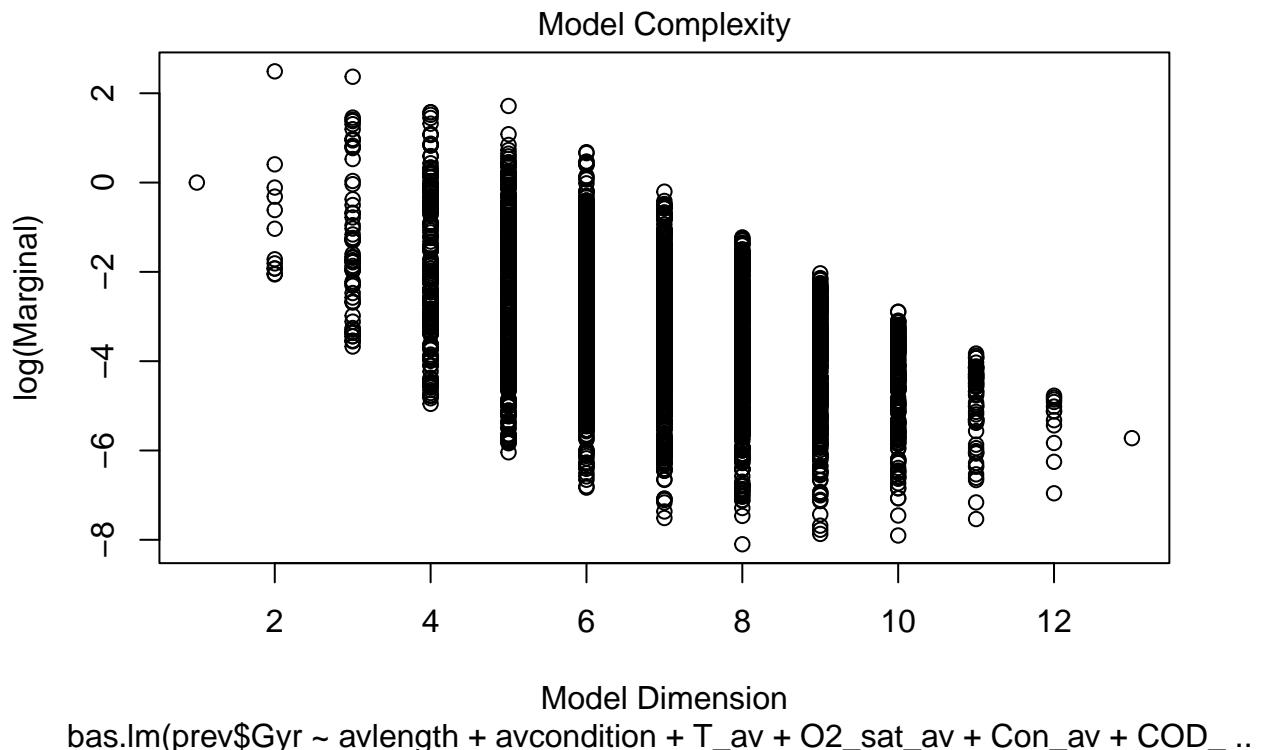
plot(bas.model)
```

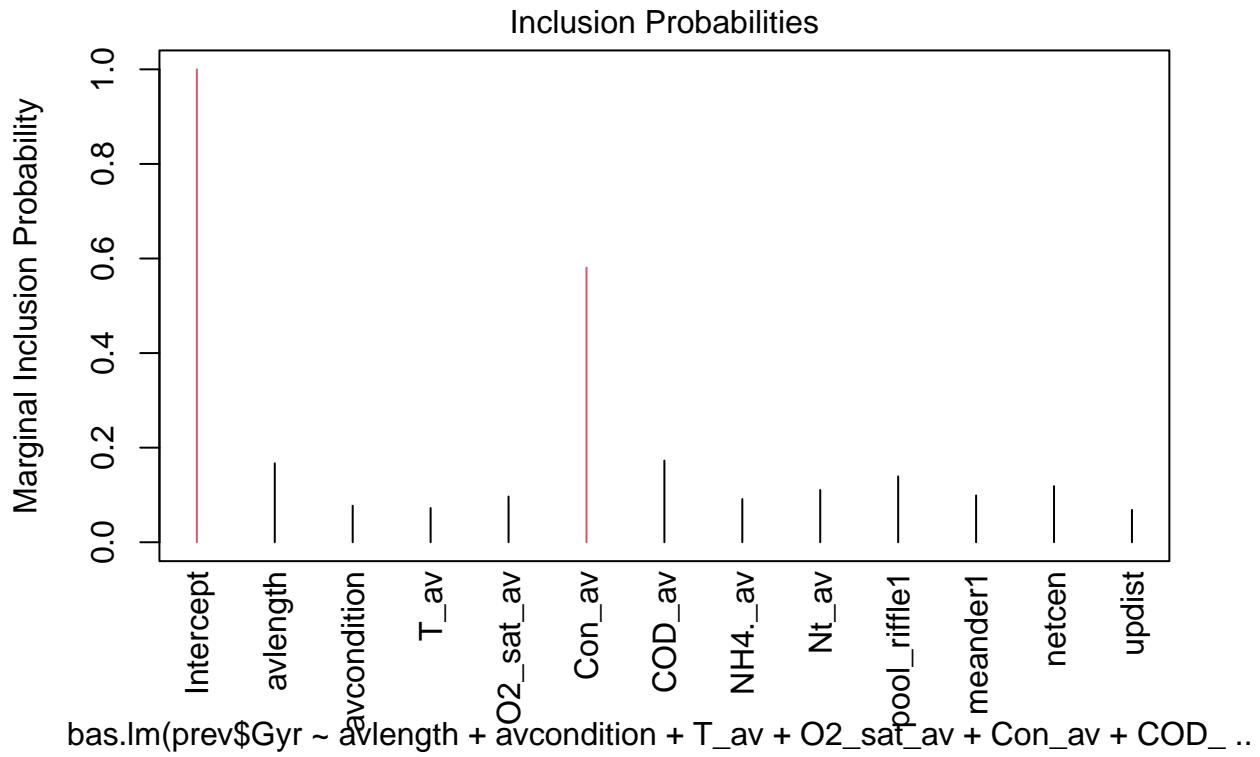


Predictions under BMA

bas.lm(prev\$Gyr ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_ ..



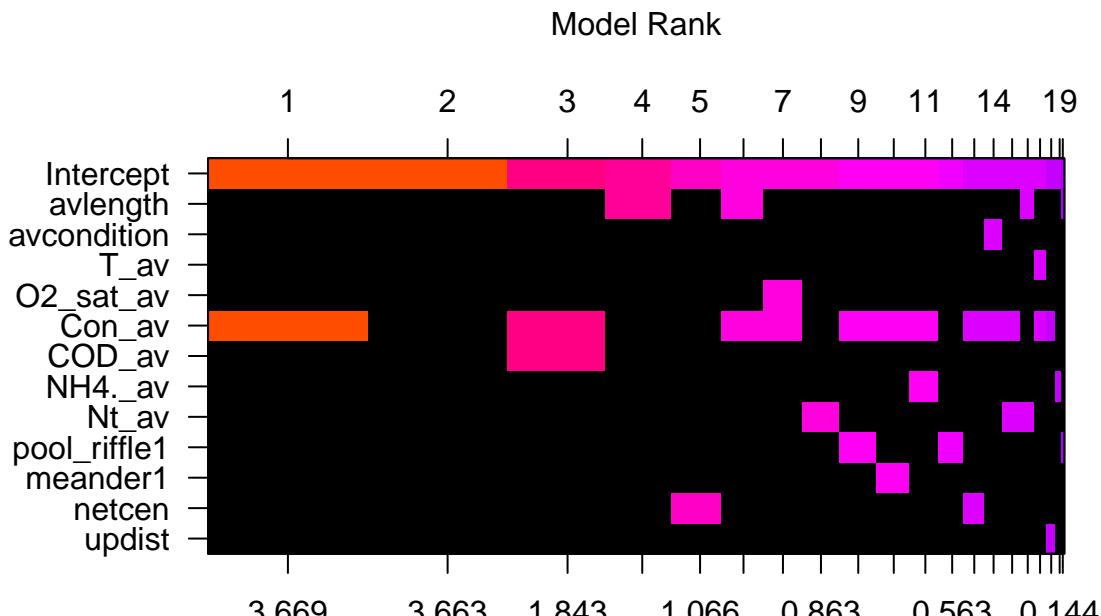




```
summary(bas.model)
```

	P(B != 0 Y)	model 1	model 2	model 3	model 4	model 5
## Intercept	1.00000000	1.000000	1.00000000	1.0000000	1.0000000	1.00000000
## avlength	0.16685753	0.000000	0.00000000	0.0000000	1.0000000	0.00000000
## avcondition	0.07728991	0.000000	0.00000000	0.0000000	0.0000000	0.00000000
## T_av	0.07242807	0.000000	0.00000000	0.0000000	0.0000000	0.00000000
## O2_sat_av	0.09667222	0.000000	0.00000000	0.0000000	0.0000000	0.00000000
## Con_av	0.58076129	1.000000	0.00000000	1.0000000	0.0000000	0.00000000
## COD_av	0.17268847	0.000000	0.00000000	1.0000000	0.0000000	0.00000000
## NH4_av	0.09134534	0.000000	0.00000000	0.0000000	0.0000000	0.00000000
## Nt_av	0.11056039	0.000000	0.00000000	0.0000000	0.0000000	0.00000000
## pool_riffle1	0.13922799	0.000000	0.00000000	0.0000000	0.0000000	0.00000000
## meander1	0.09905733	0.000000	0.00000000	0.0000000	0.0000000	0.00000000
## netcen	0.11864979	0.000000	0.00000000	0.0000000	0.0000000	1.00000000
## updist	0.06837623	0.000000	0.00000000	0.0000000	0.0000000	0.00000000
## BF	NA	1.000000	0.08283414	0.8857497	0.1246735	0.07409002
## PostProbs	NA	0.228800	0.22750000	0.0369000	0.0285000	0.01700000
## R2	NA	0.233300	0.00000000	0.3039000	0.1341000	0.10730000
## dim	NA	2.000000	1.00000000	3.0000000	2.0000000	2.00000000
## logmarg	NA	2.490915	0.00000000	2.3695941	0.4088580	-0.11155941

```
image(bas.model, rotate=F)
```



Log Posterior Odds

```
coef.model <- coef(bas.model)
abs(coef.model$postmean)-2*coef.model$postsd > 0
```

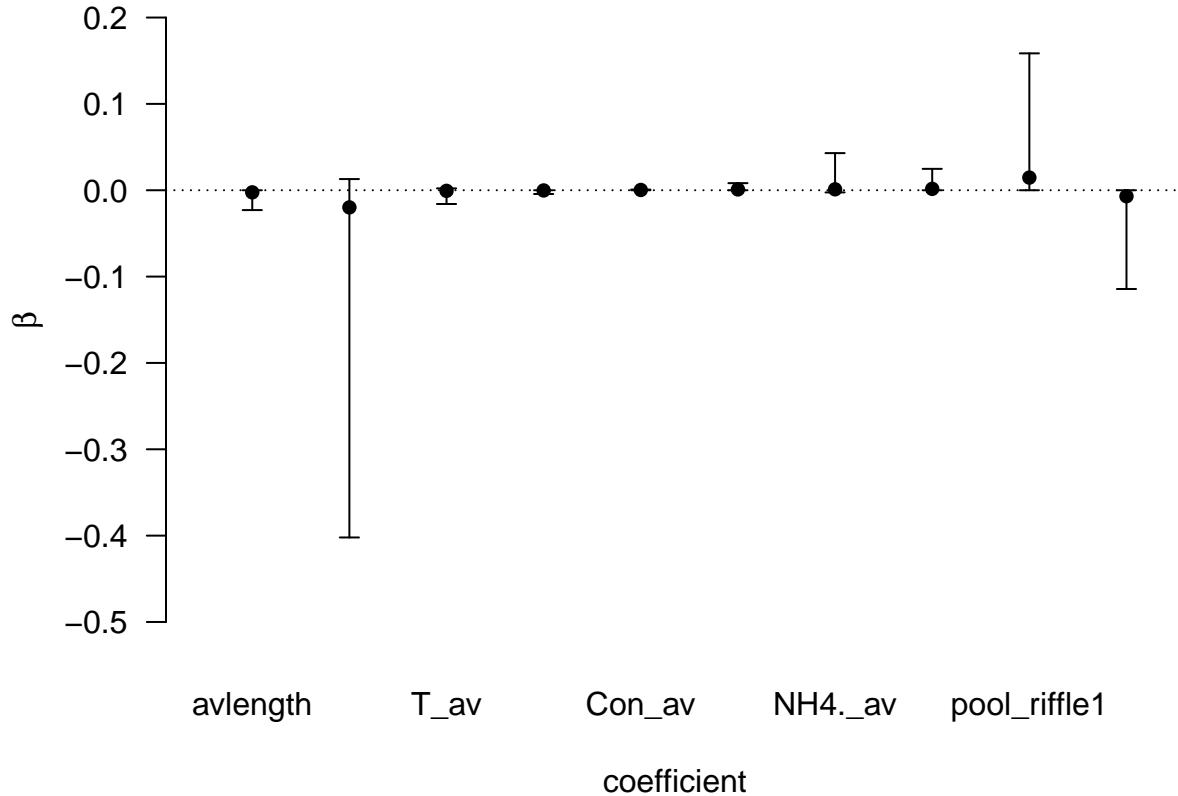
```
## [1] TRUE FALSE FALSE
## [13] FALSE
```

```
confint(coef.model)
```

```
##              2.5%      97.5%      beta
## Intercept  2.509073e-01 3.950385e-01 3.224082e-01
## avlength   -2.328123e-02 1.505298e-06 -2.431148e-03
## avcondition -3.990239e-01 0.000000e+00 -1.986363e-02
## T_av       -1.428309e-02 2.356677e-03 -7.123130e-04
## O2_sat_av  -3.919328e-03 0.000000e+00 -2.662986e-04
## Con_av     -9.105674e-08 8.142484e-04 3.112530e-04
## COD_av     -1.642588e-05 8.195153e-03 9.376253e-04
## NH4._av    -2.179084e-03 4.501120e-02 1.064409e-03
## Nt_av      -1.372744e-04 2.544977e-02 1.612509e-03
## pool_riffle1 -3.503917e-04 1.606442e-01 1.465705e-02
## meander1   -1.020722e-01 0.000000e+00 -6.966751e-03
## netcen     0.000000e+00 8.381520e-06 5.765326e-07
## updist     -8.076587e-07 5.819047e-07 -6.922933e-09
## attr(),"Probability")
## [1] 0.95
## attr(),"class")
```

```
## [1] "confint.bas"

plot(confint(coef.model, parm = 2:11))
```



```
## NULL

confint <- confint(coef.model, parm = 2:11)
write.table(confint, 'GyroAA.txt', sep="\t")
pip <- summary(bas.model)
PIP[c(1:12),3] <- pip[2:13,1]*sign(coef.model$postmean[2:13])
```

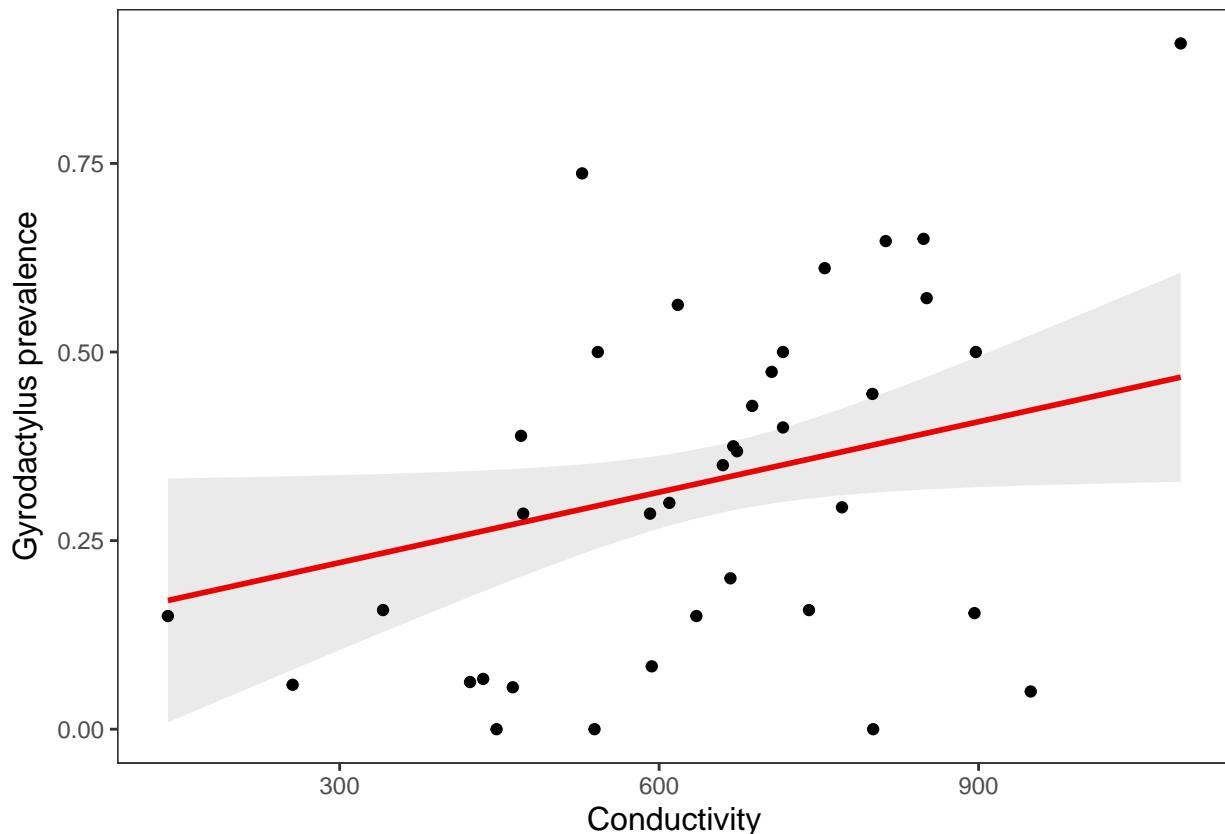
6.3.2.3 Prediction plot for marginal effect of conductivity on average Gyrodactylus infection

```
newdata1 <- newdata; newdata1[, "Con_av"] <- environment2$Con_av
BMA <- predict(bas.model, newdata = newdata1, estimator = "BMA", se.fit=TRUE)
ggplot(environment2, aes(Con_av, BMA$fit)) +
  theme_bw() +
  geom_line(color="red", size=1) +
  geom_ribbon(aes(ymin = (BMA$fit-BMA$se.bma.fit), ymax = (BMA$fit+BMA$se.bma.fit)), alpha = .1) +
  geom_point(data = environment2, aes(x=Con_av, y=prev$Gyr)) +
```

```

  labs(x=expression("Conductivity"), y=expression("Gyrodactylus prevalence")) +
  theme(axis.title.x = element_text(size=12),
        axis.title.y = element_text(size=12)) +  theme(panel.grid.major = element_blank(), panel.grid.m

```



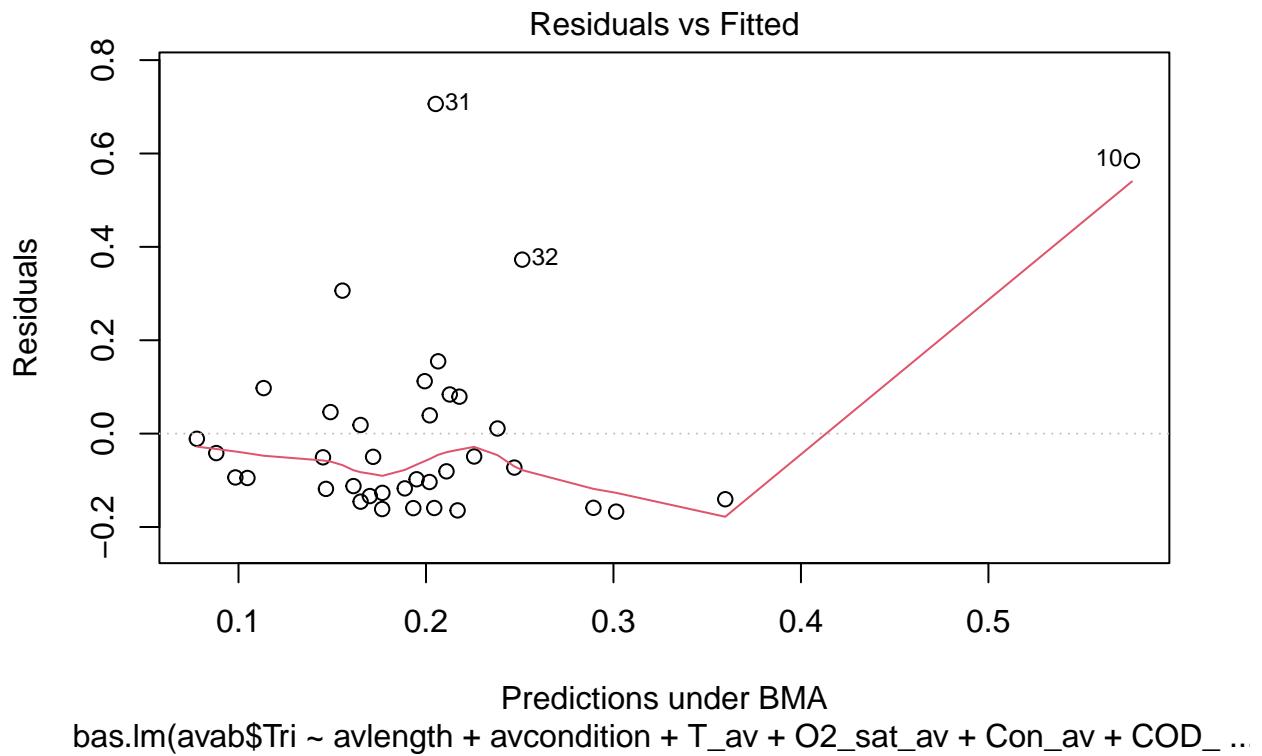
6.4 Variation in Trichodina infection

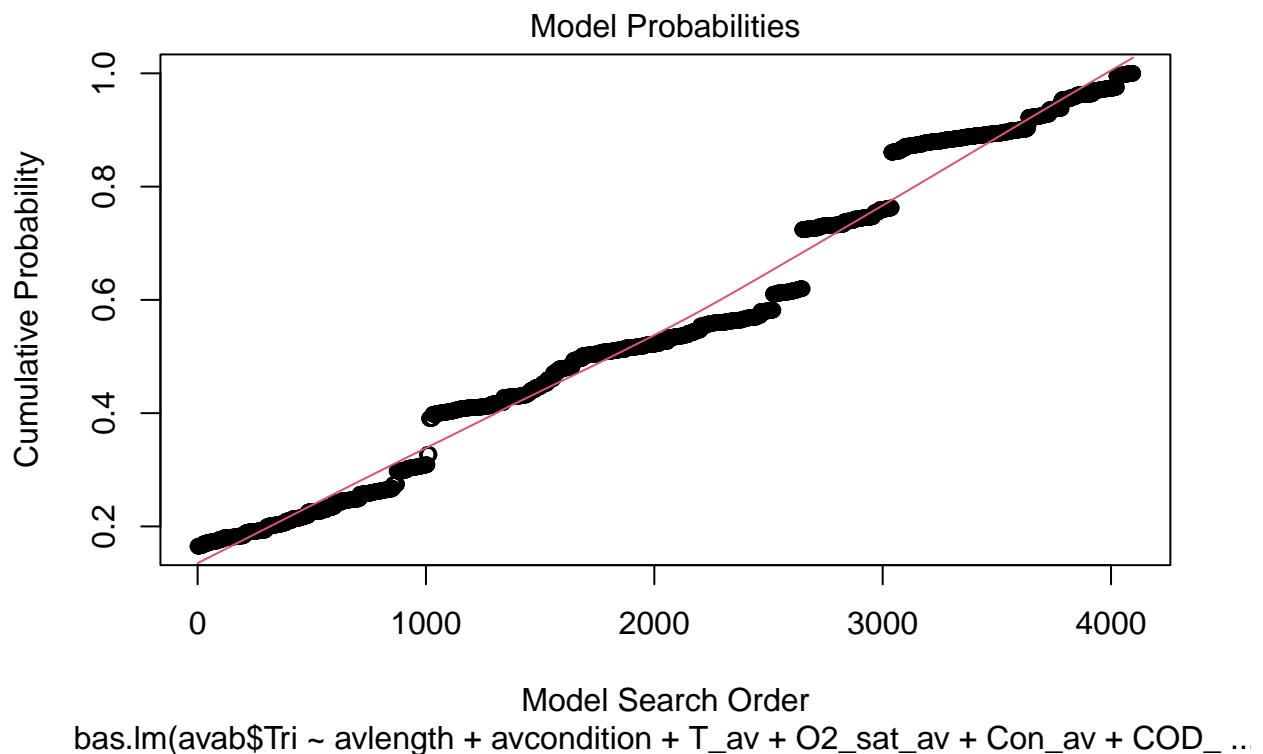
6.4.1 Mean abundance

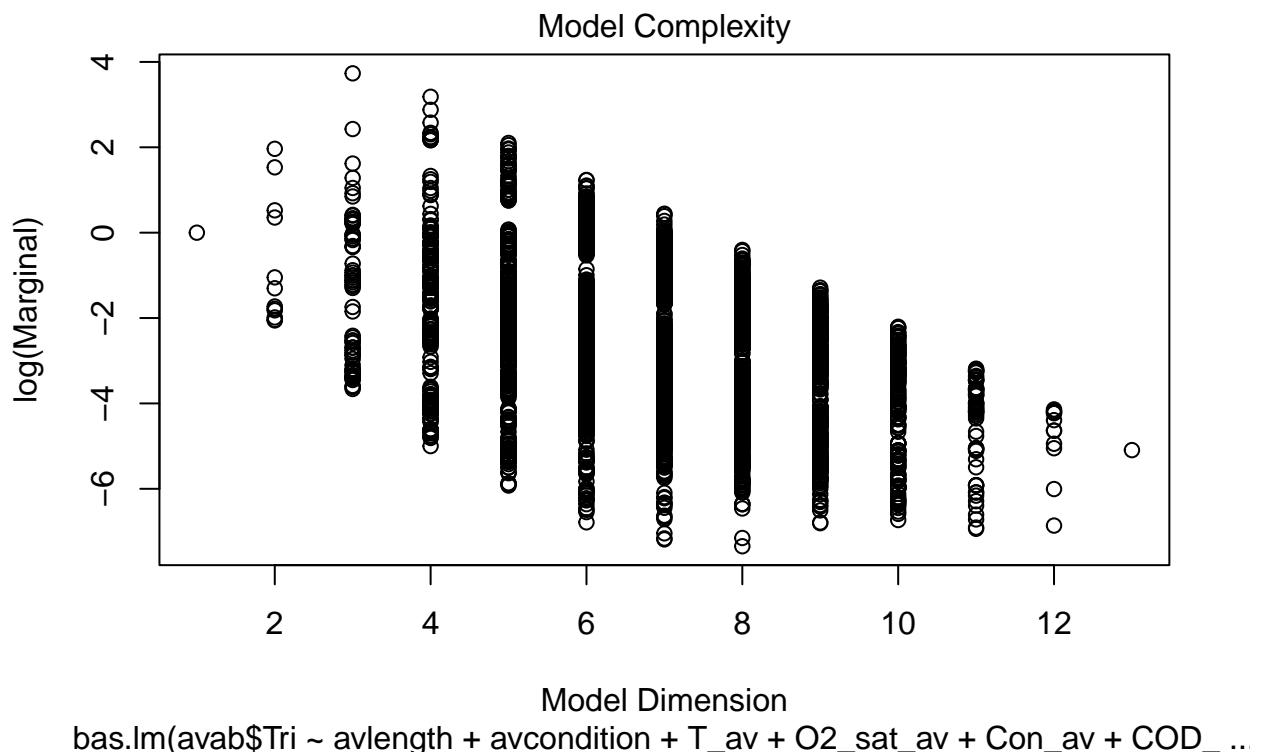
```

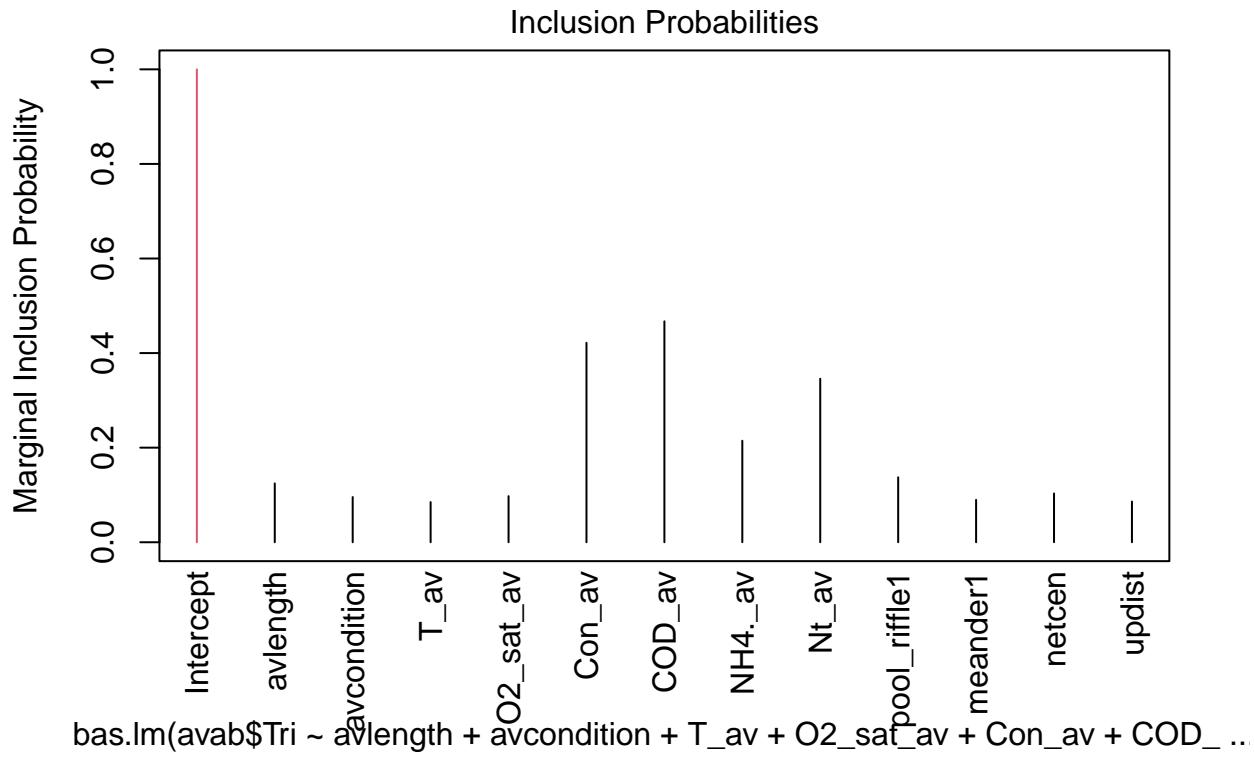
bas.model <- bas.lm(avab$Tri ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
+ NH4._av + Nt_av + pool_riffle + meander + netcen +
updist, data=environment2, prior="JZS")
yhat = fitted(bas.model, estimator = "BMA") #these are the fitted values under BMA
r = bas.model$Y - yhat #these are the model residuals
plot(bas.model)

```





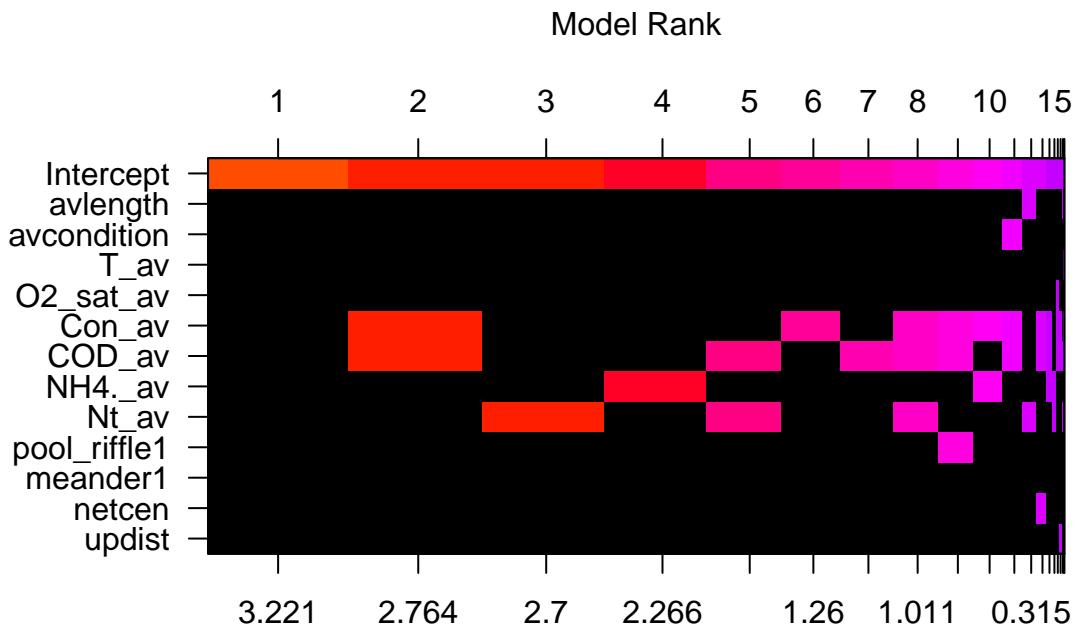




```
summary(bas.model)
```

```
##          P(B != 0 | Y)   model 1   model 2   model 3   model 4   model 5
## Intercept      1.0000000 1.0000000 1.000000 1.000000 1.0000000 1.0000000
## avlength       0.12444042 0.0000000 0.000000 0.000000 0.0000000 0.0000000
## avcondition    0.09559152 0.0000000 0.000000 0.000000 0.0000000 0.0000000
## T_av           0.08500185 0.0000000 0.000000 0.000000 0.0000000 0.0000000
## O2_sat_av     0.09751169 0.0000000 0.000000 0.000000 0.0000000 0.0000000
## Con_av         0.42180029 0.0000000 1.000000 0.000000 0.0000000 0.0000000
## COD_av         0.46724539 0.0000000 1.000000 0.000000 0.0000000 1.0000000
## NH4._av        0.21465122 0.0000000 0.000000 0.000000 1.0000000 0.0000000
## Nt_av           0.34576751 0.0000000 0.000000 1.000000 0.0000000 1.0000000
## pool_riffle1   0.13743699 0.0000000 0.000000 0.000000 0.0000000 0.0000000
## meander1        0.08968689 0.0000000 0.000000 0.000000 0.0000000 0.0000000
## netcen          0.10313787 0.0000000 0.000000 0.000000 0.0000000 0.0000000
## updist          0.08604777 0.0000000 0.000000 0.000000 0.0000000 0.0000000
## BF              NA 0.0239404 1.000000 0.170643 0.1105942 0.2711811
## PostProbs       NA 0.1650000 0.104400 0.098000 0.0635000 0.0283000
## R2              NA 0.0000000 0.358500 0.209300 0.1890000 0.3063000
## dim             NA 1.0000000 3.000000 2.000000 2.0000000 3.0000000
## logmarg         NA 0.0000000 3.732188 1.964006 1.5303004 2.4272192
```

```
image(bas.model, rotate=F)
```



Log Posterior Odds

```

coef.model <- coef(bas.model)
abs(coef.model$postmean)-2*coef.model$postsd > 0

## [1] TRUE FALSE FALSE
## [13] FALSE

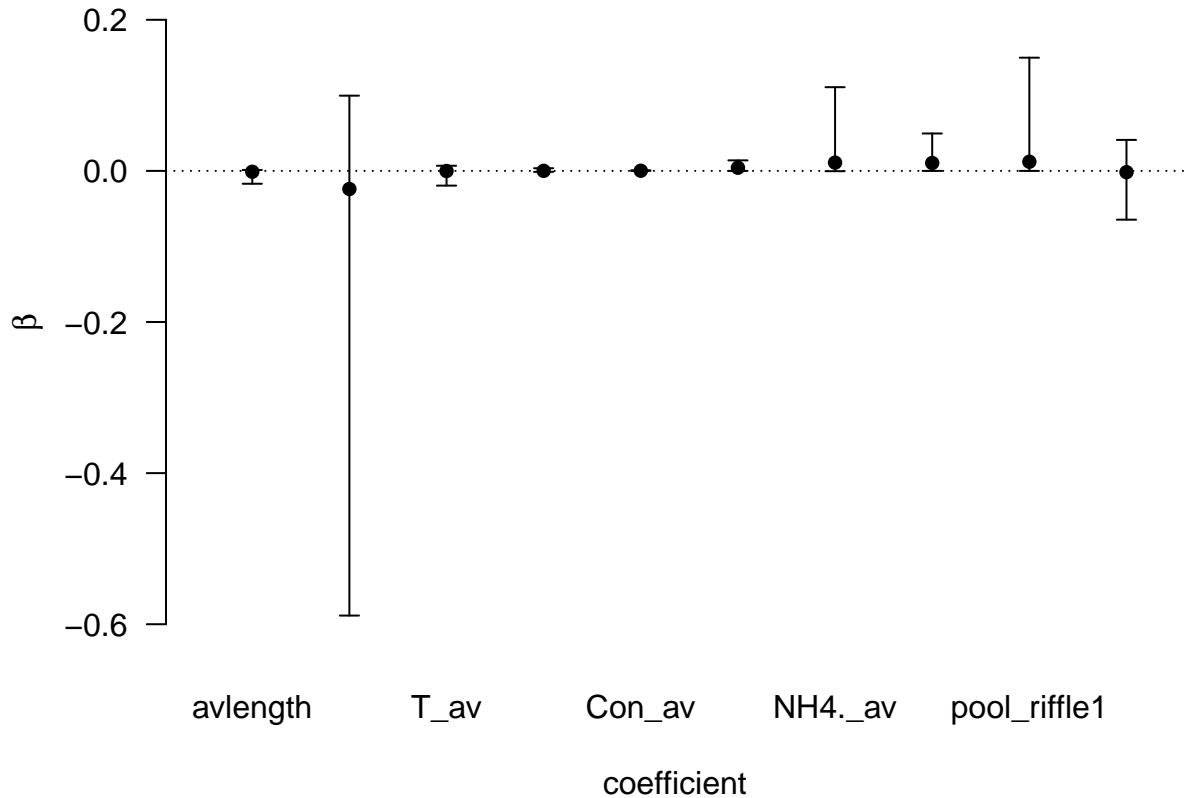
confint(coef.model)

##                   2.5%      97.5%       beta
## Intercept    1.279605e-01 2.742419e-01 2.002413e-01
## avlength     -1.658515e-02 0.000000e+00 -1.114390e-03
## avcondition  -5.904354e-01 2.843695e-03 -2.394139e-02
## T_av         -1.379986e-02 1.258849e-02 -1.479738e-04
## O2_sat_av   -1.502751e-03 3.609376e-03 1.132458e-04
## Con_av        0.000000e+00 7.742212e-04 2.109076e-04
## COD_av        0.000000e+00 1.385923e-02 4.203136e-03
## NH4._av      -2.120275e-03 1.062726e-01 1.096330e-02
## Nt_av         0.000000e+00 4.899695e-02 1.044647e-02
## pool_riffle1 -9.348264e-04 1.508672e-01 1.212839e-02
## meander1     -2.447037e-02 6.992684e-02 -1.678368e-03
## netcen        -5.278113e-06 2.036847e-06 -2.846749e-07
## updist       -1.357602e-06 5.003725e-07 -1.915234e-08
## attr(),"Probability")
## [1] 0.95
## attr(),"class")

```

```
## [1] "confint.bas"

plot(confint(coef.model, parm = 2:11))
```

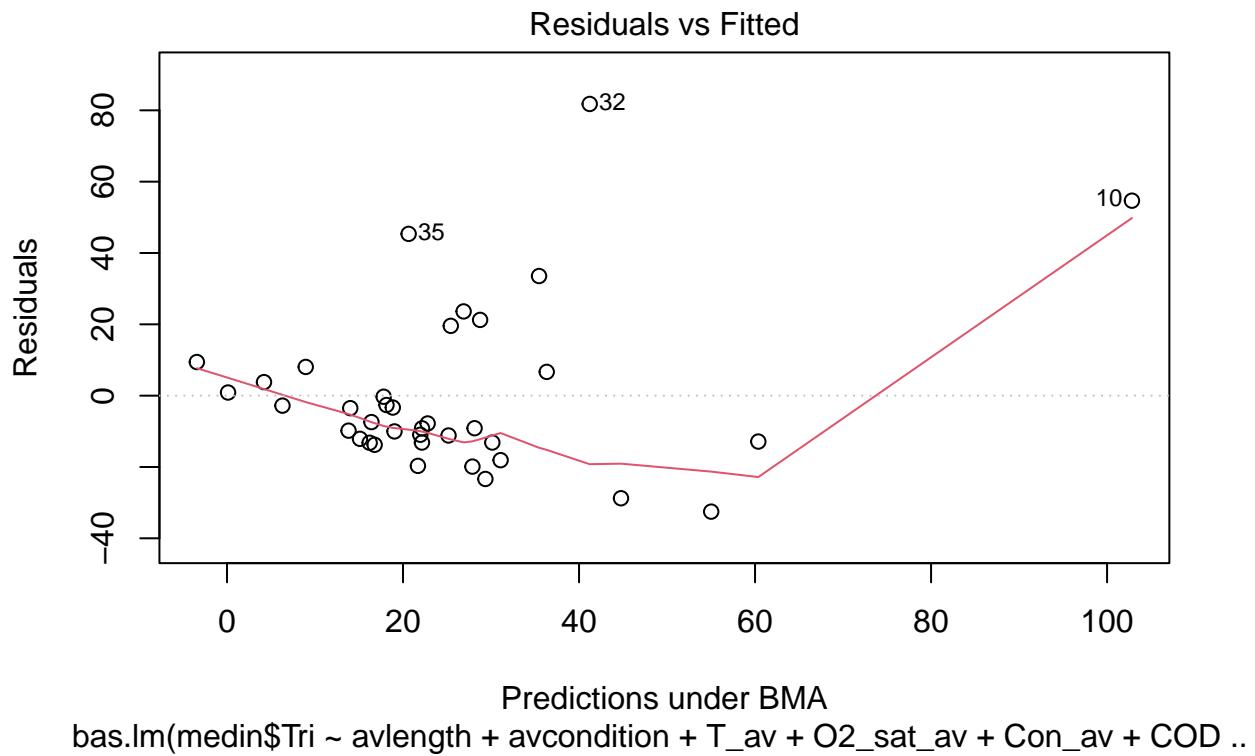


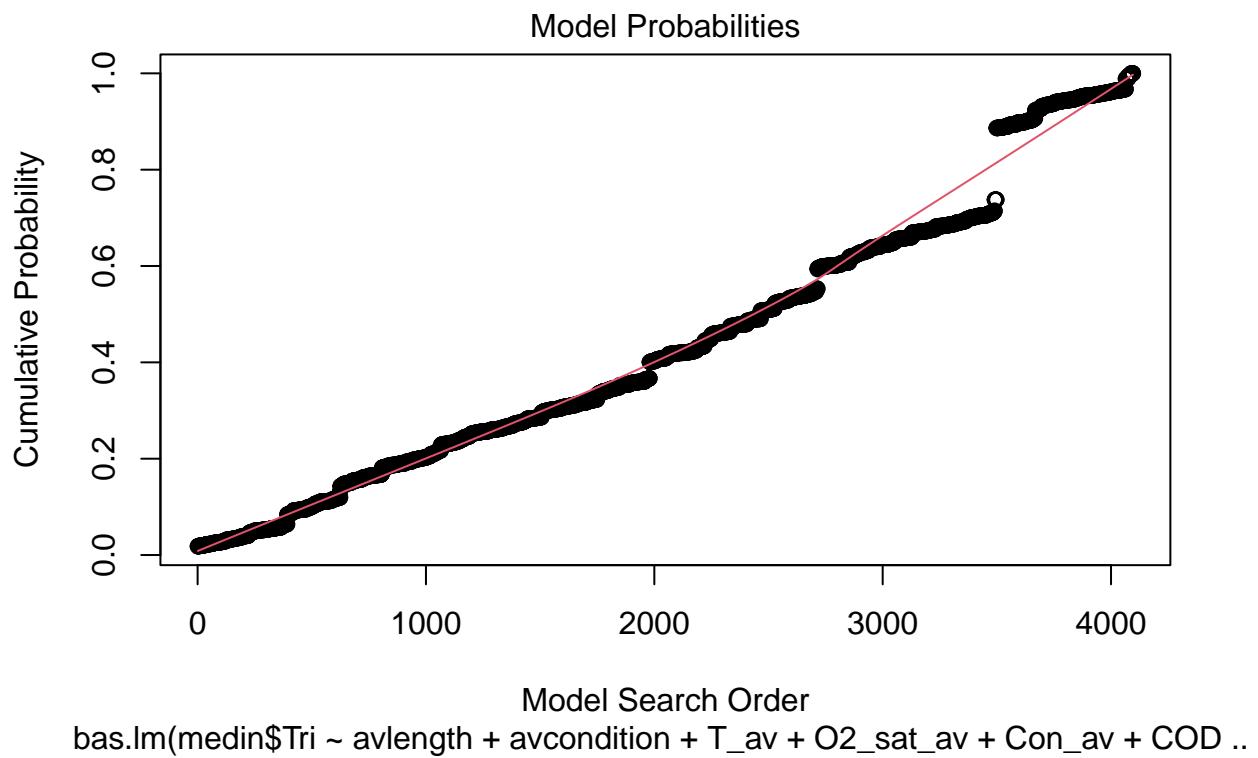
```
## NULL

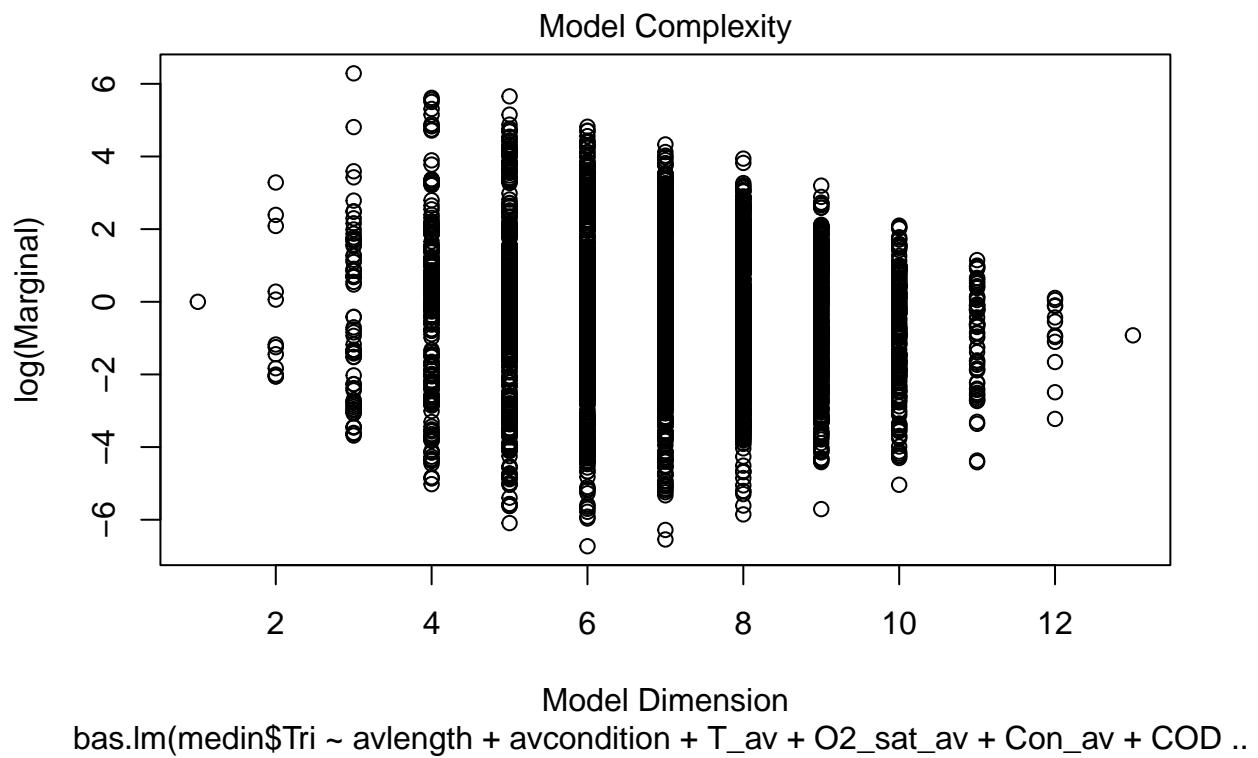
confint <- confint(coef.model, parm = 2:11)
write.table(confint, 'GyroAA.txt', sep="\t")
pip <- summary(bas.model)
PIP[c(1:12),3] <- pip[2:13,1]*sign(coef.model$postmean[2:13])
```

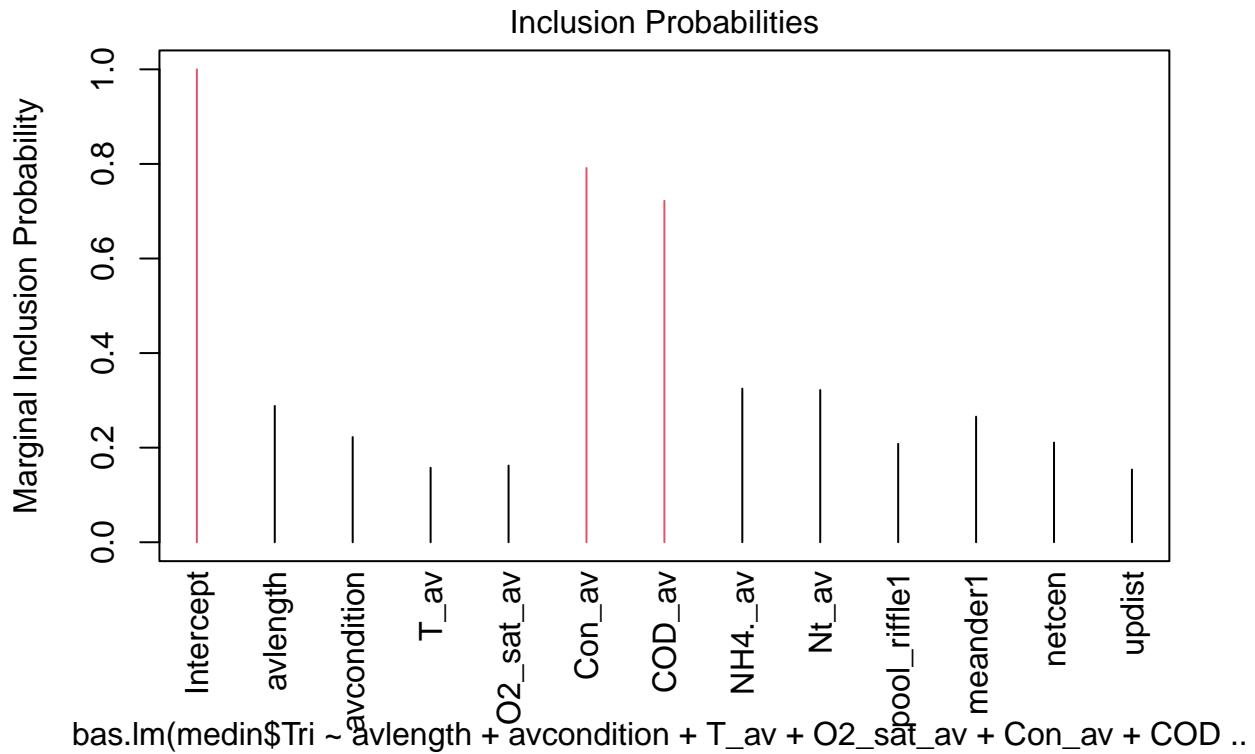
6.4.1 Median infection intensity

```
bas.model <- bas.lm(medin$Tri ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
+ NH4._av + Nt_av + pool_riffle + meander + netcen +
updist, data=environment2, prior="JZS")
yhat = fitted(bas.model, estimator = "BMA") #these are the fitted values under BMA
r = bas.model$Y - yhat #these are the model residuals
plot(bas.model)
```





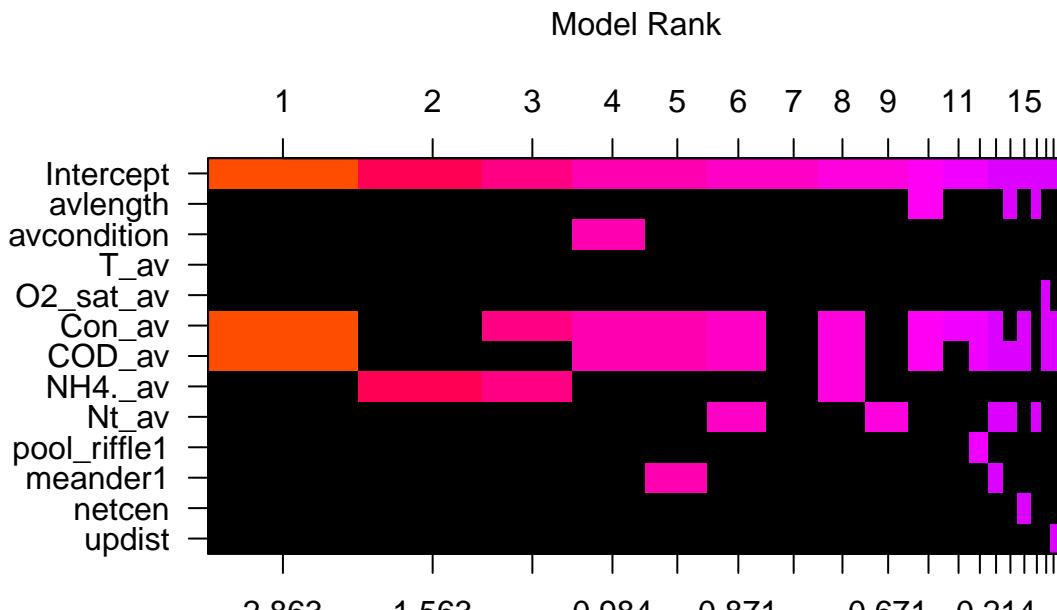




```
summary(bas.model)
```

	P(B != 0 Y)	model 1	model 2	model 3	model 4	model 5
## Intercept	1.0000000	1.000000	1.00000000	1.0000000	1.0000000	1.0000000
## avlength	0.2881774	0.000000	0.00000000	0.0000000	0.0000000	0.0000000
## avcondition	0.2224163	0.000000	0.00000000	0.0000000	1.0000000	0.0000000
## T_av	0.1574615	0.000000	0.00000000	0.0000000	0.0000000	0.0000000
## O2_sat_av	0.1621652	0.000000	0.00000000	0.0000000	0.0000000	0.0000000
## Con_av	0.7912882	1.000000	0.00000000	1.0000000	1.0000000	1.0000000
## COD_av	0.7219333	1.000000	0.00000000	0.0000000	1.0000000	1.0000000
## NH4_av	0.3248706	0.000000	1.00000000	1.0000000	0.0000000	0.0000000
## Nt_av	0.3218716	0.000000	0.00000000	0.0000000	0.0000000	0.0000000
## pool_riffle1	0.2081402	0.000000	0.00000000	0.0000000	0.0000000	0.0000000
## meander1	0.2655250	0.000000	0.00000000	0.0000000	0.0000000	1.0000000
## netcen	0.2107764	0.000000	0.00000000	0.0000000	0.0000000	0.0000000
## updist	0.1536937	0.000000	0.00000000	0.0000000	0.0000000	0.0000000
## BF	NA	1.000000	0.04957628	0.2279222	0.5092549	0.4837322
## PostProbs	NA	0.148800	0.04060000	0.0339000	0.0227000	0.0216000
## R2	NA	0.449900	0.26810000	0.3987000	0.4816000	0.4799000
## dim	NA	3.000000	2.00000000	3.0000000	4.0000000	4.0000000
## logmarg	NA	6.288599	3.28435583	4.8098478	5.6137920	5.5623749

```
image(bas.model, rotate=F)
```



```

coef.model <- coef(bas.model)
abs(coef.model$postmean)-2*coef.model$postsd > 0

## [1] TRUE FALSE FALSE
## [13] FALSE

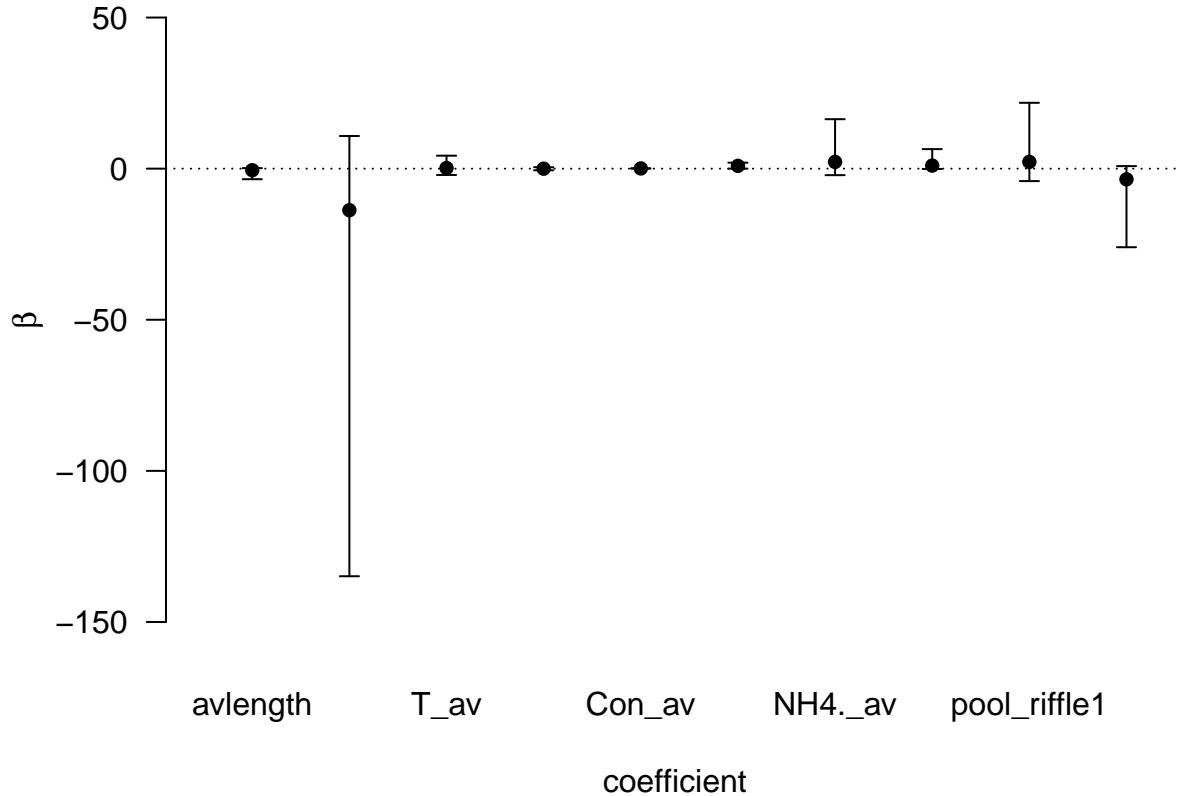
confint(coef.model)

##                   2.5%      97.5%       beta
## Intercept     1.642318e+01 3.428561e+01 2.547297e+01
## avlength     -3.581079e+00 7.846949e-02 -5.158998e-01
## avcondition  -1.289728e+02 1.086060e+01 -1.375058e+01
## T_av          -1.720128e+00 4.911051e+00 2.065105e-01
## O2_sat_av    -5.624713e-01 4.733730e-01 -1.498026e-02
## Con_av        0.000000e+00 1.291062e-01 6.585727e-02
## COD_av        -4.387314e-04 1.997096e+00 9.195418e-01
## NH4._av       -2.444050e+00 1.594891e+01 2.222211e+00
## Nt_av          -2.926365e-01 6.370673e+00 1.012166e+00
## pool_riffle1 -1.910209e+00 2.414732e+01 2.247962e+00
## meander1      -2.709687e+01 3.586591e-01 -3.523477e+00
## netcen         -1.449526e-03 2.299008e-04 -1.366046e-04
## updist        -2.491842e-04 2.567229e-04 5.653370e-06
## attr(),"Probability")
## [1] 0.95
## attr(),"class")

```

```
## [1] "confint.bas"

plot(confint(coef.model, parm = 2:11))
```



```
## NULL

confint <- confint(coef.model, parm = 2:11)
write.table(confint, 'GyroAA.txt', sep="\t")
pip <- summary(bas.model)
PIP[c(1:12),3] <- pip[2:13,1]*sign(coef.model$postmean[2:13])
```

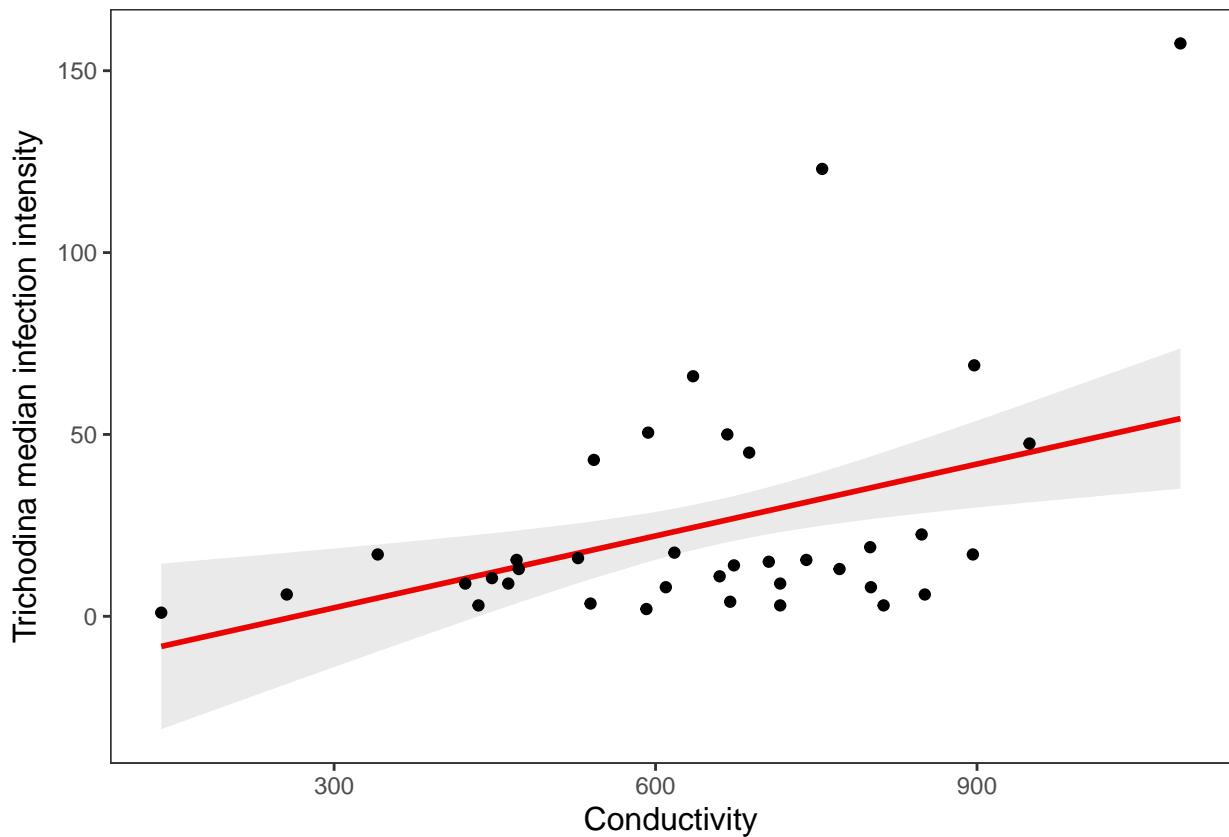
6.3.2.3 Prediction plot for marginal effect of conductivity on median infection intensity with Trichodina

```
newdata1 <- newdata; newdata1[, "Con_av"] <- environment2$Con_av
BMA <- predict(bas.model, newdata = newdata1, estimator = "BMA", se.fit=TRUE)
ggplot(environment2, aes(Con_av, BMA$fit)) +
  theme_bw() +
  geom_line(color="red", size=1) +
  geom_ribbon(aes(ymin = (BMA$fit-BMA$se.bma.fit), ymax = (BMA$fit+BMA$se.bma.fit)), alpha = .1) +
  geom_point(data = environment2, aes(x=Con_av, y=medin$Tri)) +
```

```

  labs(x=expression("Conductivity"), y=expression("Trichodina median infection intensity")) +
  theme(axis.title.x = element_text(size=12),
        axis.title.y = element_text(size=12)) +  theme(panel.grid.major = element_blank(), panel.grid.m

```

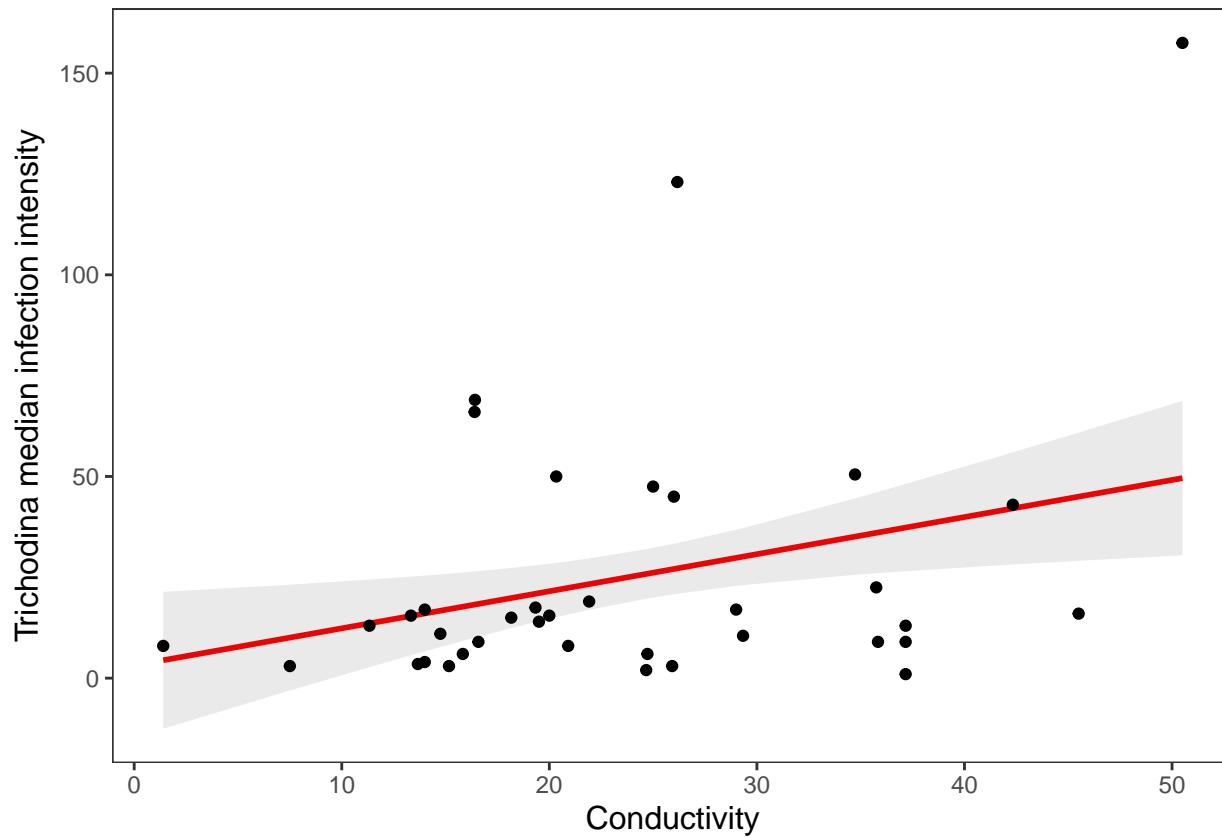


6.3.2.3 Prediction plot for marginal effect of COD on median infection intensity with Trichodina

```

newdata1 <- newdata; newdata1[, "COD_av"] <- environment2$COD_av
BMA <- predict(bas.model, newdata = newdata1, estimator = "BMA", se.fit=TRUE)
ggplot(environment2, aes(COD_av, BMA$fit)) +
  theme_bw() +
  geom_line(color="red", size=1) +
  geom_ribbon(aes(ymin = (BMA$fit-BMA$se.bma.fit), ymax = (BMA$fit+BMA$se.bma.fit)), alpha = .1) +
  geom_point(data = environment2, aes(x=COD_av, y=medin$Tri)) +
  labs(x=expression("Conductivity"), y=expression("Trichodina median infection intensity")) +
  theme(axis.title.x = element_text(size=12),
        axis.title.y = element_text(size=12)) +  theme(panel.grid.major = element_blank(), panel.grid.m

```

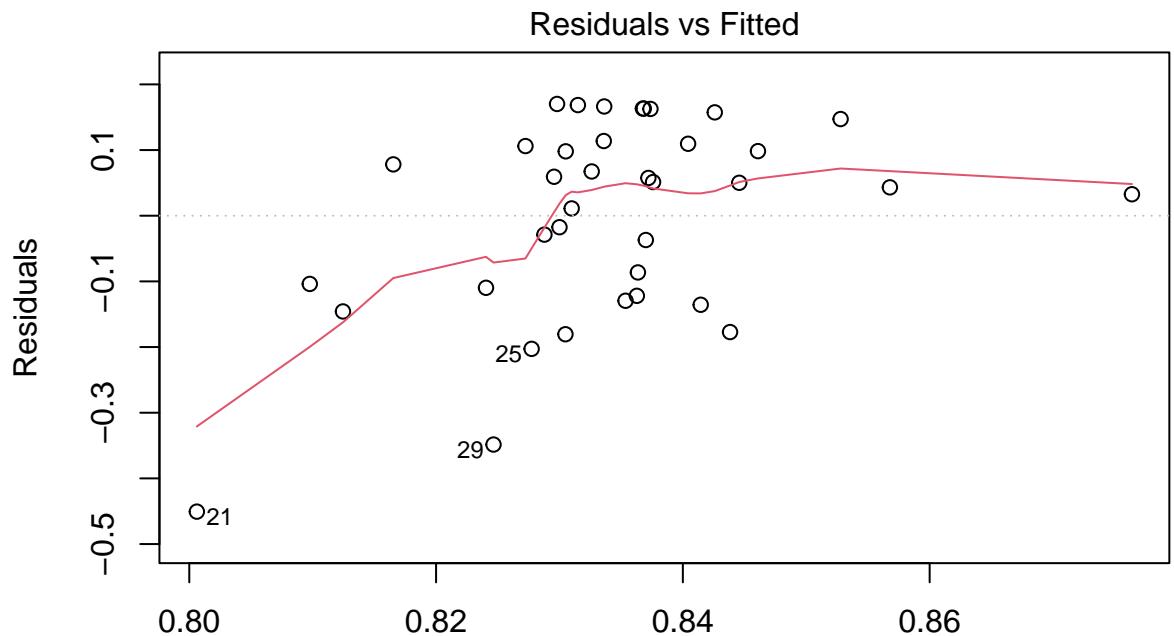


6.4.1 Prevalence

```

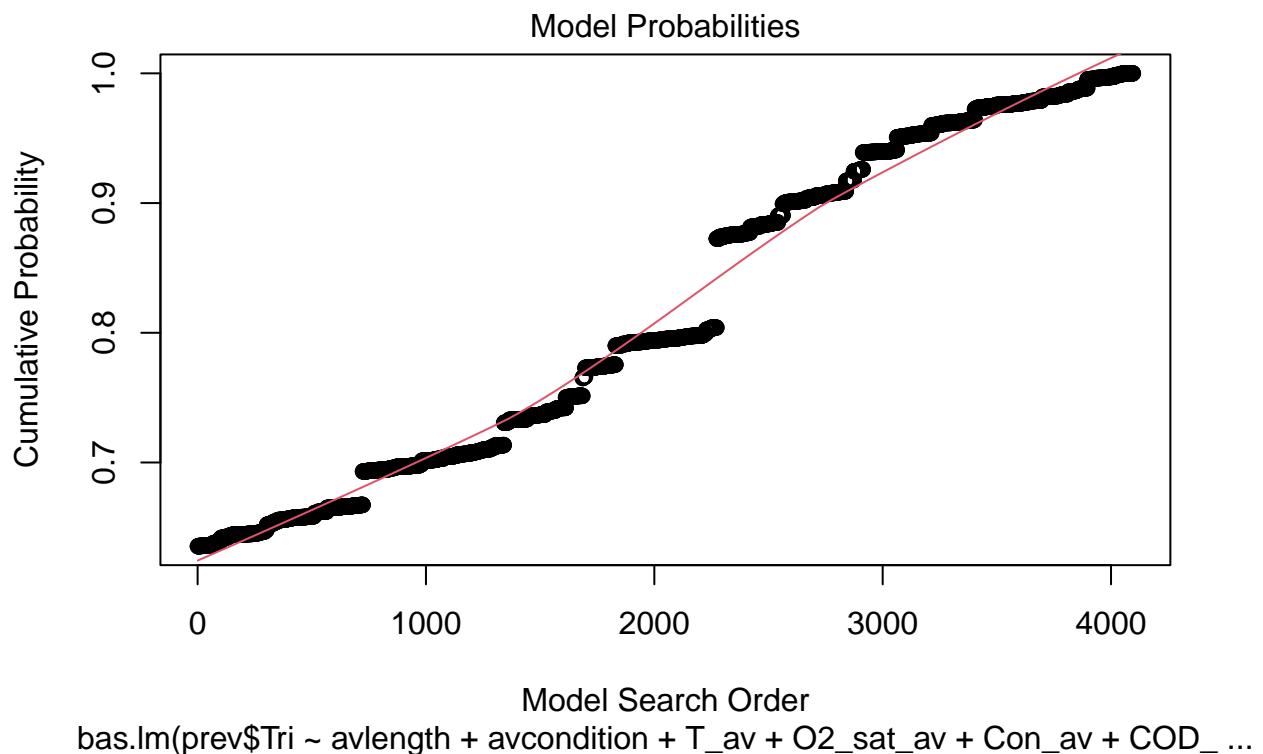
bas.model <- bas.lm(prev$Tri ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
+ NH4_av + Nt_av + pool_riffle + meander + netcen +
updist, data=environment2, prior="JZS")
yhat = fitted(bas.model, estimator = "BMA") #these are the fitted values under BMA
r = bas.model$Y - yhat #these are the model residuals
plot(bas.model)

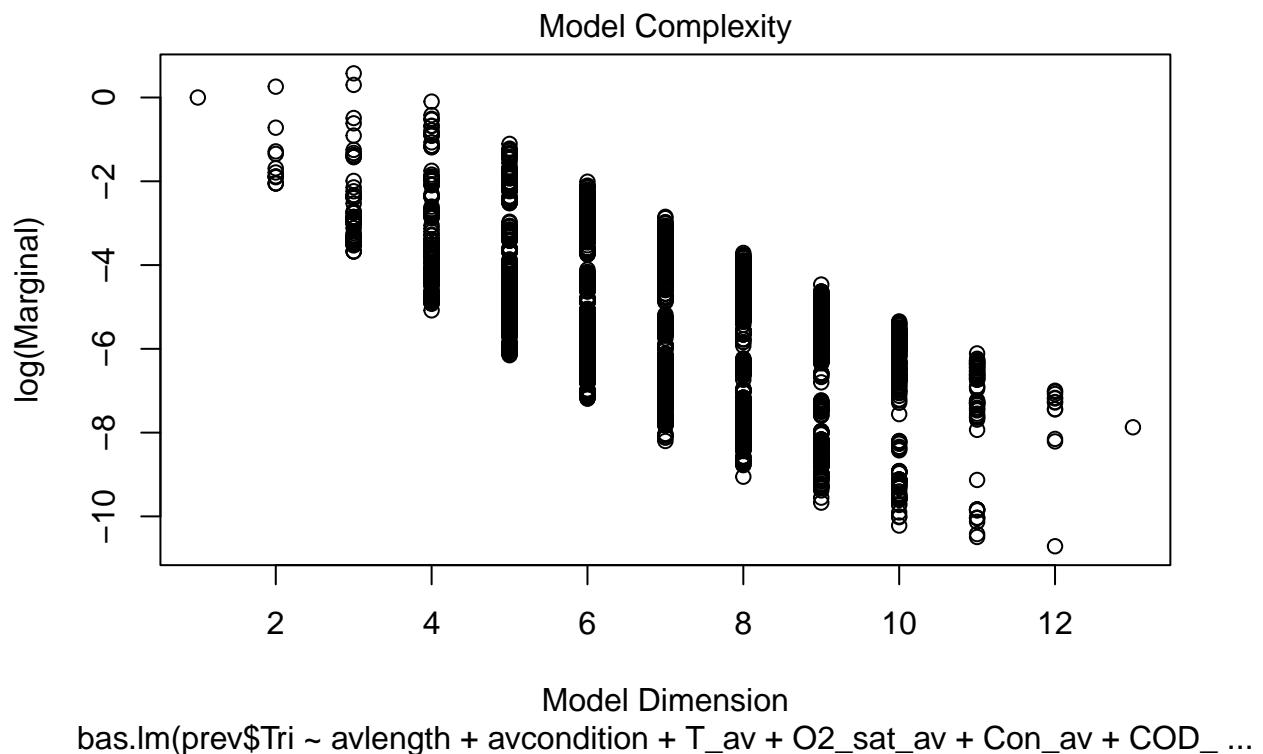
```

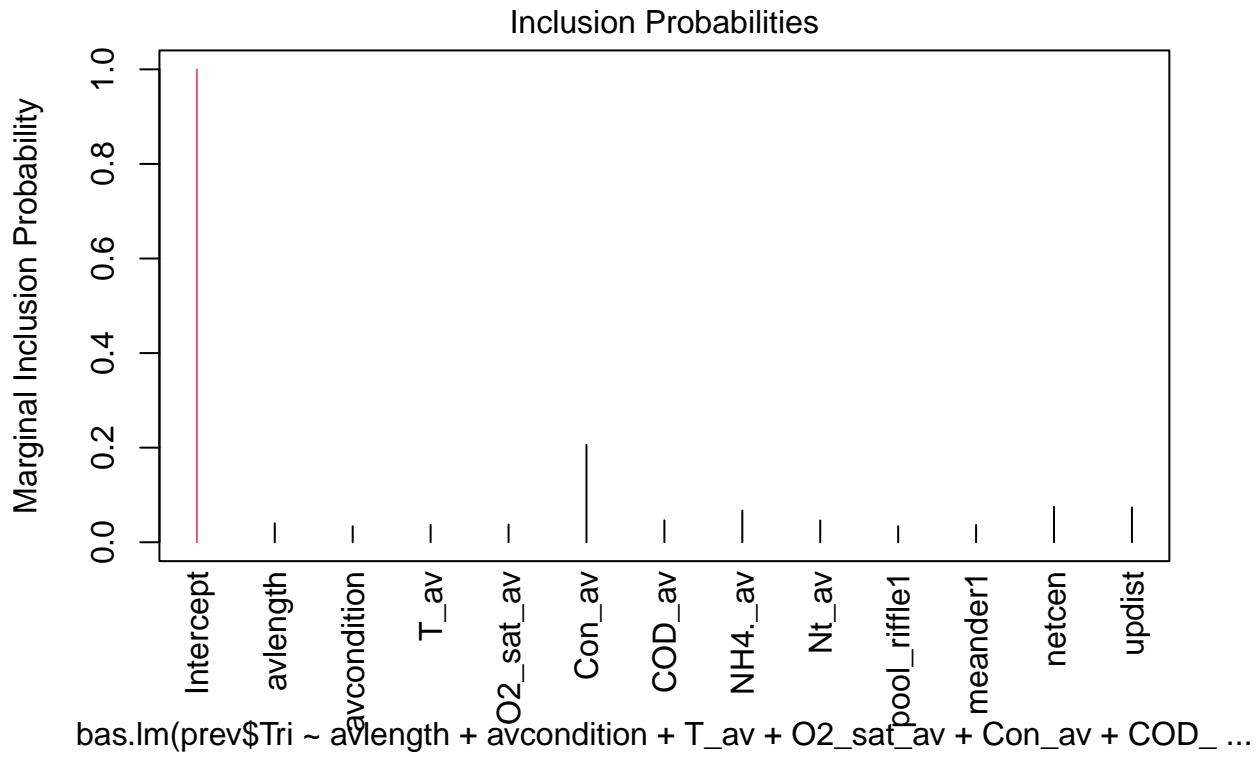


Predictions under BMA

```
bas.lm(prev$Tri ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_ ...)
```



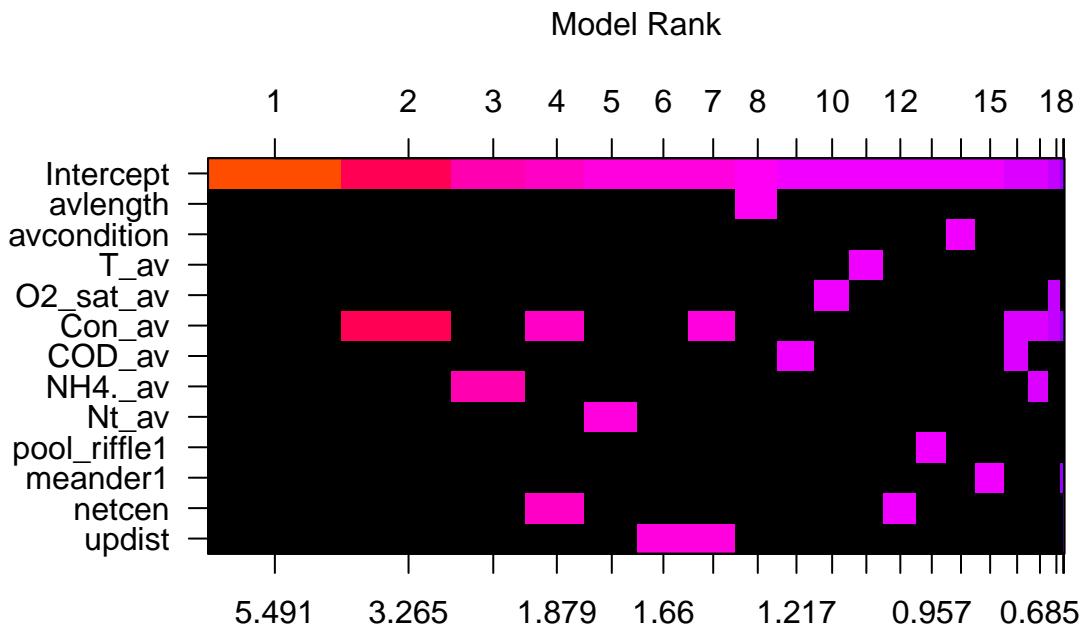




```
summary(bas.model)
```

	P(B != 0 Y)	model 1	model 2	model 3	model 4	model 5
## Intercept	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000
## avlength	0.04005815	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## avcondition	0.03389439	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## T_av	0.03654853	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## O2_sat_av	0.03749123	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## Con_av	0.20573471	0.0000000	1.0000000	0.0000000	1.0000000	0.0000000
## COD_av	0.04629842	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## NH4._av	0.06690739	0.0000000	0.0000000	1.0000000	0.0000000	0.0000000
## Nt_av	0.04604656	0.0000000	0.0000000	0.0000000	0.0000000	1.0000000
## pool_riffle1	0.03411173	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## meander1	0.03657952	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## netcen	0.07467299	0.0000000	0.0000000	0.0000000	1.0000000	0.0000000
## updist	0.07352673	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## BF	NA	0.5616705	0.7274201	0.2732671	1.0000000	0.155205
## PostProbs	NA	0.6354000	0.0686000	0.0258000	0.0171000	0.014600
## R2	NA	0.0000000	0.1264000	0.0750000	0.2249000	0.044000
## dim	NA	1.0000000	2.0000000	2.0000000	3.0000000	2.0000000
## logmarg	NA	0.0000000	0.2585887	-0.7204656	0.5768398	-1.286169

```
image(bas.model, rotate=F)
```



```

coef.model <- coef(bas.model)
abs(coef.model$postmean)-2*coef.model$postsd > 0

## [1] TRUE FALSE FALSE
## [13] FALSE

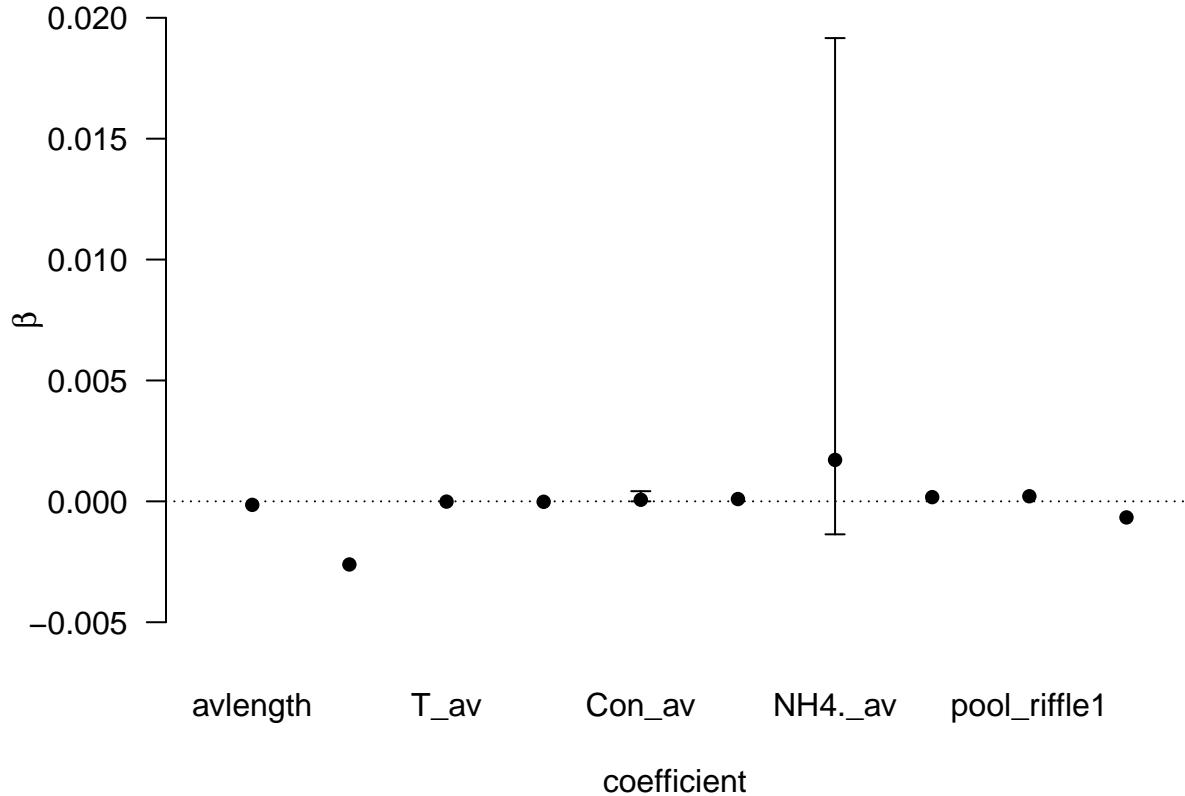
confint(coef.model)

##                   2.5%      97.5%       beta
## Intercept    7.840281e-01 8.871900e-01 8.340580e-01
## avlength     0.000000e+00 0.000000e+00 -1.453558e-04
## avcondition   0.000000e+00 0.000000e+00 -2.610917e-03
## T_av         0.000000e+00 0.000000e+00 -1.135202e-05
## O2_sat_av    0.000000e+00 0.000000e+00 -1.893466e-05
## Con_av        0.000000e+00 4.215072e-04 6.570599e-05
## COD_av        0.000000e+00 0.000000e+00 9.451636e-05
## NH4._av      -1.132240e-05 1.837716e-02 1.713706e-03
## Nt_av         0.000000e+00 0.000000e+00 1.739937e-04
## pool_riffle1  0.000000e+00 0.000000e+00 2.104077e-04
## meander1      0.000000e+00 0.000000e+00 -6.652944e-04
## netcen        -4.204725e-06 1.612296e-07 -3.317353e-07
## updist        -1.618819e-06 5.813820e-09 -1.309710e-07
## attr(),"Probability")
## [1] 0.95
## attr(),"class")

```

```
## [1] "confint.bas"

plot(confint(coef.model, parm = 2:11))
```

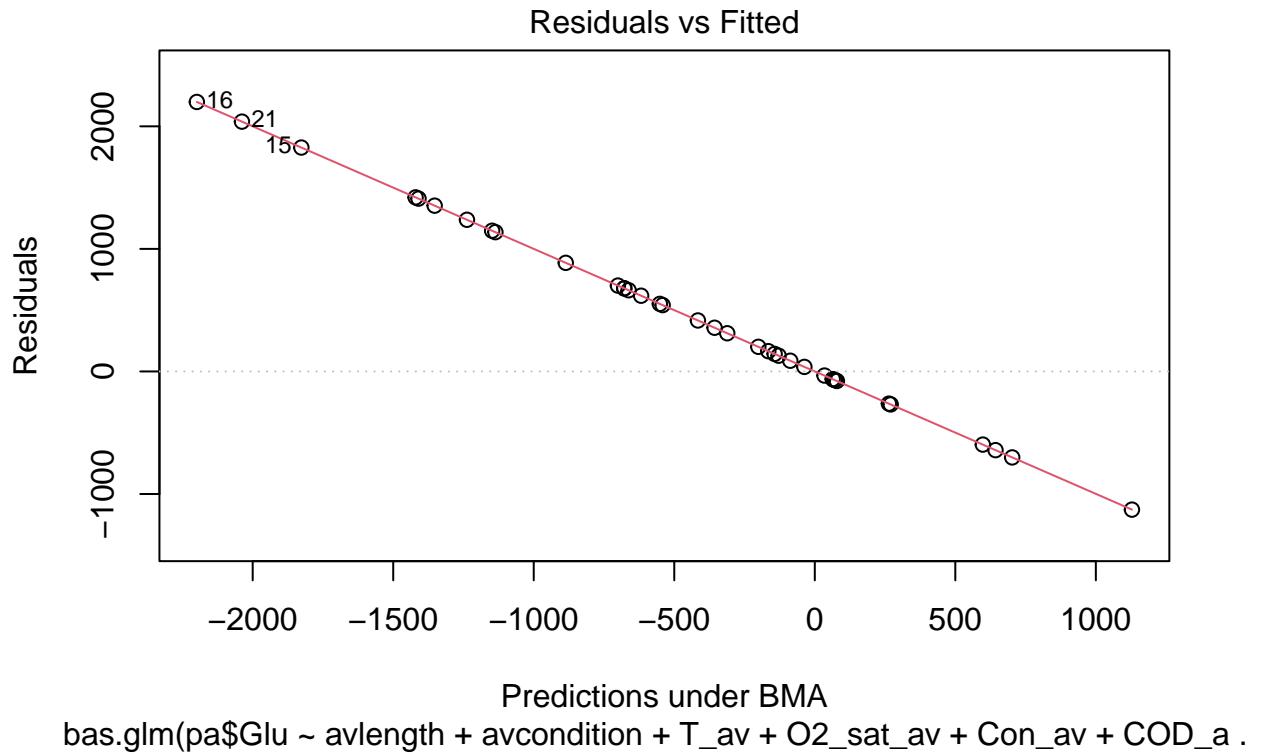


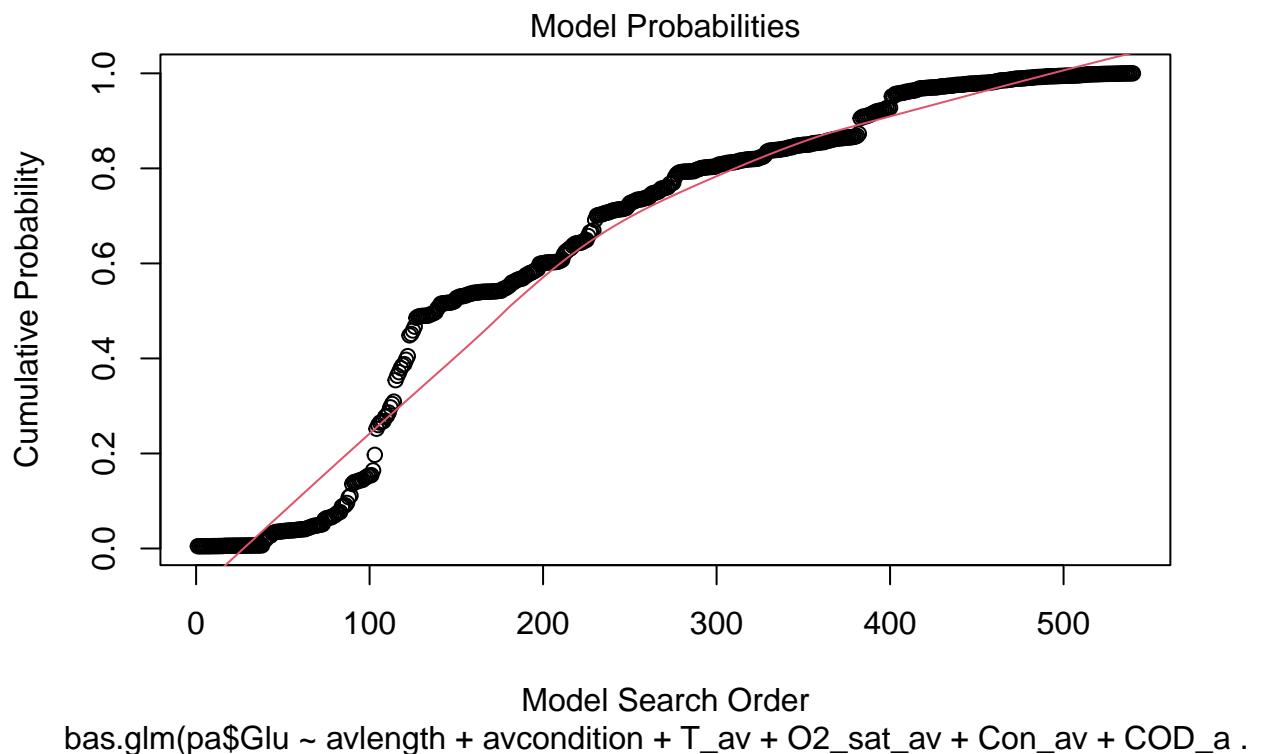
```
## NULL

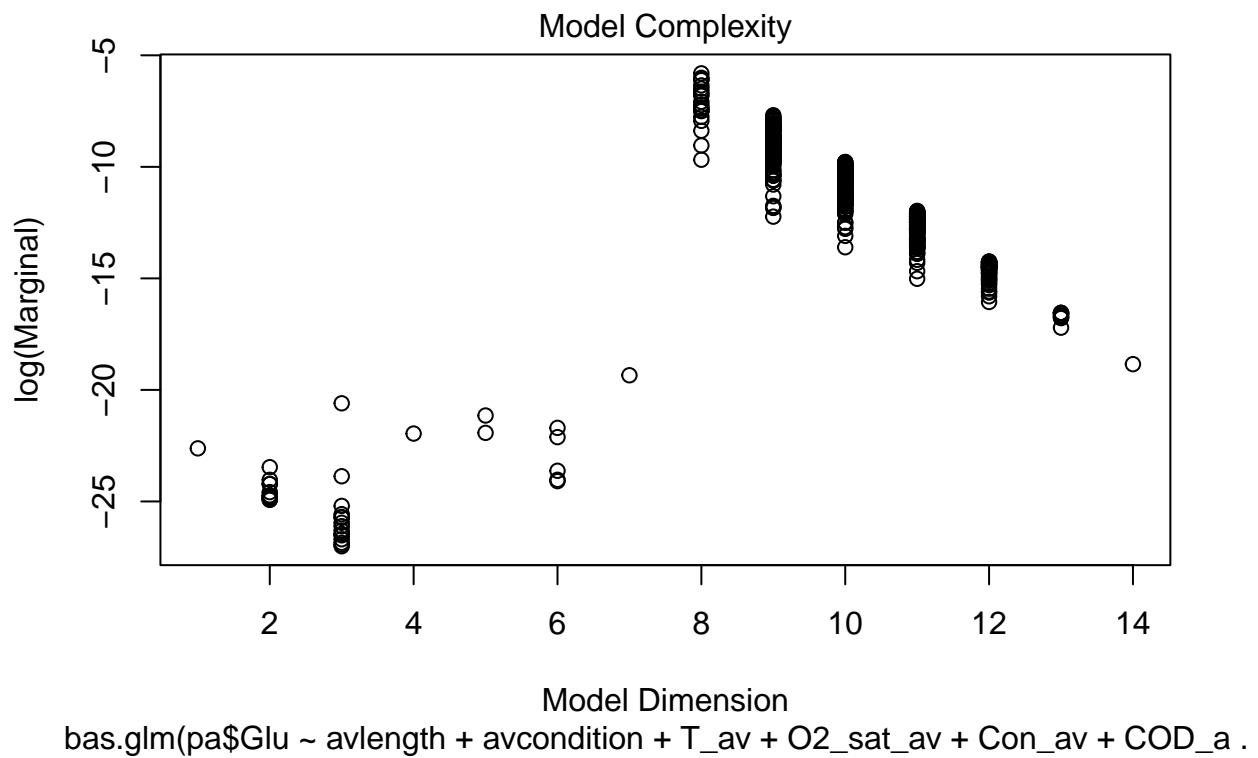
confint <- confint(coef.model, parm = 2:11)
write.table(confint, 'GyroAA.txt', sep="\t")
pip <- summary(bas.model)
PIP[c(1:12),3] <- pip[2:13,1]*sign(coef.model$postmean[2:13])
```

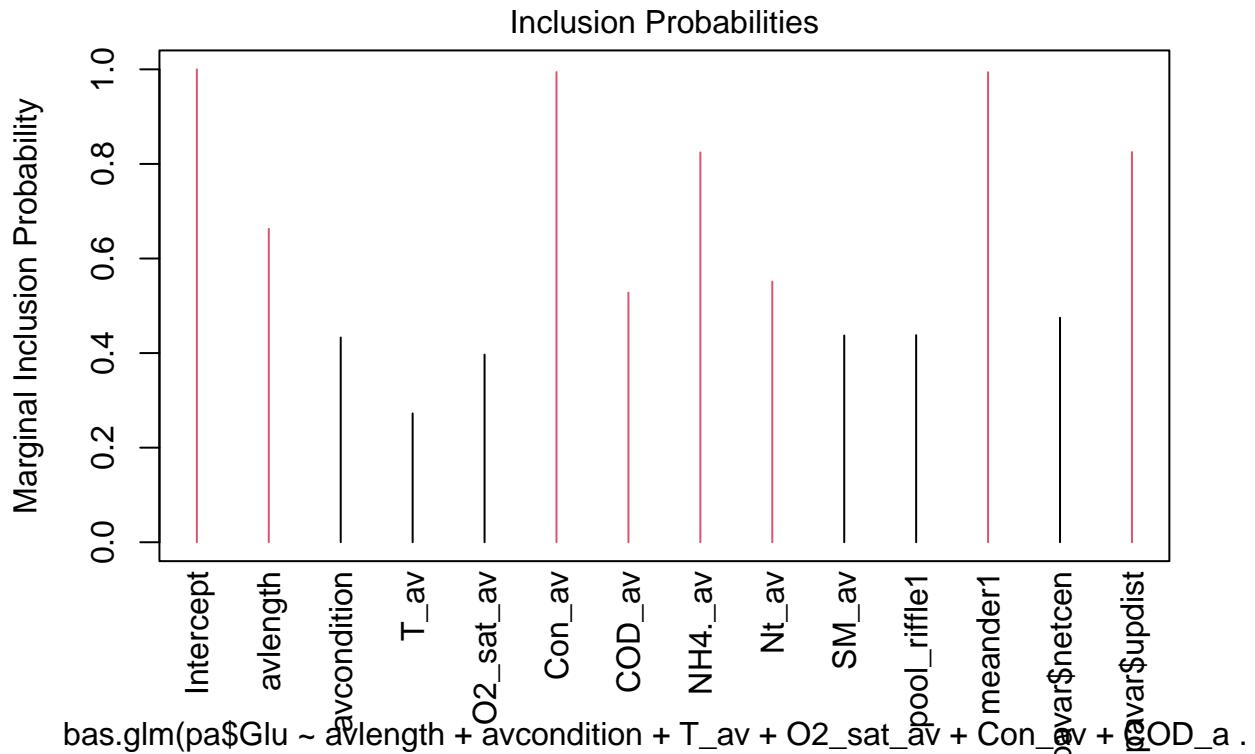
6.5 Variation in Glugea infection

```
bas.model <- bas.glm(pa$Glu ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av +
                      NH4._av + Nt_av + SM_av + pool_riffle + meander +
                      spavar$netcen + spavar$updist, data=environment2, betaprior=g.prior(100), family=
yhat = fitted(bas.model, estimator = "BMA") #these are the fitted values under BMA
r = bas.model$Y - yhat #these are the model residuals
plot(bas.model)
```









```
summary(bas.model)
```

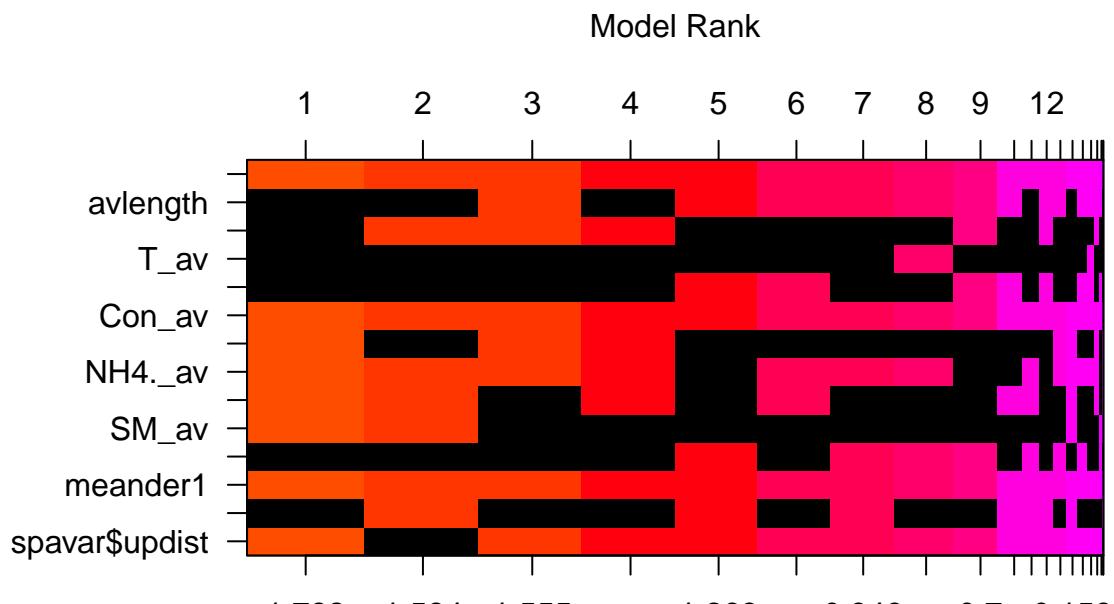
```
##          P(B != 0 | Y)    model 1    model 2    model 3    model 4
## Intercept      1.0000000  1.000000  1.000000  1.0000000  1.0000000
## avlength       0.6627197  0.000000  0.000000  1.0000000  0.0000000
## avcondition    0.4329712  0.000000  1.000000  1.0000000  1.0000000
## T_av           0.2724976  0.000000  0.000000  0.0000000  0.0000000
## O2_sat_av      0.3968262  0.000000  0.000000  0.0000000  0.0000000
## Con_av         0.9942383  1.000000  1.000000  1.0000000  1.0000000
## COD_av         0.5278442  1.000000  0.000000  1.0000000  1.0000000
## NH4_av          0.8243774  1.000000  1.000000  1.0000000  1.0000000
## Nt_av           0.5512939  1.000000  1.000000  0.0000000  1.0000000
## SM_av           0.4371460  1.000000  1.000000  0.0000000  0.0000000
## pool_riffle1   0.4378662  0.000000  0.000000  0.0000000  0.0000000
## meander1        0.9939453  1.000000  1.000000  1.0000000  1.0000000
## spavar$netcen  0.4746582  0.000000  1.000000  0.0000000  0.0000000
## spavar$updist  0.8251099  1.000000  0.000000  1.0000000  1.0000000
## BF                NA     1.000000  0.769804  0.8189871  0.7351301
## PostProbs       NA     0.054900  0.045100  0.0437000  0.0328000
## R2                NA     1.000000  1.000000  1.0000000  1.0000000
## dim               NA     8.000000  8.000000  8.0000000  8.0000000
## logmarg          NA    -5.808403 -6.070023 -6.0080902 -6.1161110
##                      model 5
## Intercept      1.0000000
## avlength       1.0000000
```

```

## avcondition 0.0000000
## T_av 0.0000000
## O2_sat_av 1.0000000
## Con_av 1.0000000
## COD_av 0.0000000
## NH4._av 0.0000000
## Nt_av 0.0000000
## SM_av 0.0000000
## pool_riffle1 1.0000000
## meander1 1.0000000
## spavar$netcen 1.0000000
## spavar$updist 1.0000000
## BF 0.5830791
## PostProbs 0.0327000
## R2 1.0000000
## dim 8.0000000
## logmarg -6.3478357

```

```
image(bas.model, rotate=F)
```



Log Posterior Odds

```
coef.model <- coef(bas.model)
```

```

## Warning in object$prior == "AIC" || object$prior == "BIC": 'length(x) = 540 > 1'
## in coercion to 'logical(1)'

```

```

## Warning in object$prior == "AIC" || object$prior == "BIC": 'length(x) = 540 > 1'
## in coercion to 'logical(1)'

abs(coef.model$postmean)-2*coef.model$postsd > 0

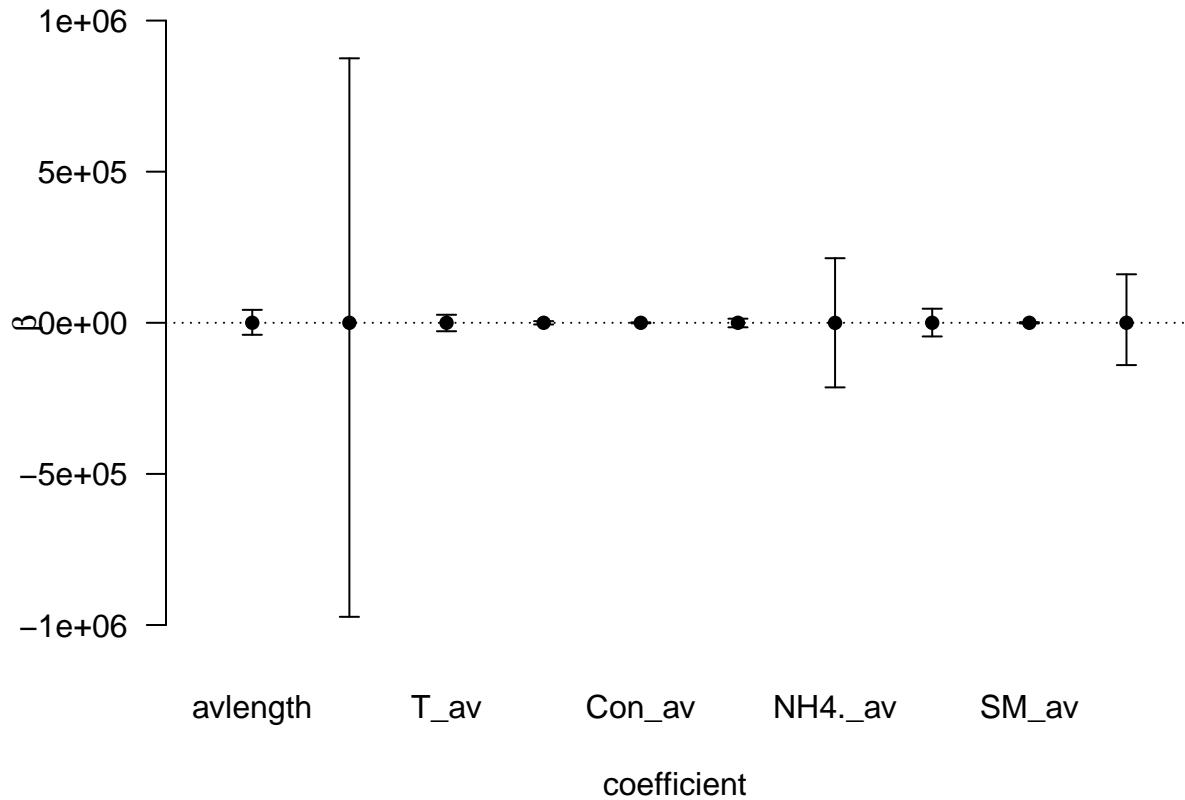
## [1] FALSE FALSE
## [13] FALSE FALSE

confint(coef.model)

##              2.5%      97.5%       beta
## Intercept    -2.782238e+06 2.829461e+06 -6.170033e+03
## avlength     -3.786439e+04 4.526059e+04  8.756265e+01
## avcondition   -9.491127e+05 8.486992e+05  1.153226e+01
## T_av          -3.063378e+04 2.399069e+04  1.651735e+01
## O2_sat_av     -5.872815e+03 5.361022e+03  8.795436e+00
## Con_av        -1.551568e+03 1.576429e+03  4.252651e+00
## COD_av        -1.448051e+04 1.260537e+04  9.168884e+00
## NH4._av       -2.056834e+05 2.164140e+05 -2.613575e+02
## Nt_av          -4.452396e+04 4.503968e+04  3.610454e+01
## SM_av          -2.120033e+03 2.258536e+03 -1.094009e+00
## pool_riffle1  -1.389113e+05 1.402153e+05  9.254160e+01
## meander1       -4.837128e+05 5.180584e+05 -1.328272e+03
## spavar$netcen -9.538867e+00 9.315741e+00 -8.882530e-03
## spavar$updist  -4.988180e+00 4.669318e+00 -7.857987e-03
## attr(),"Probability")
## [1] 0.95
## attr(),"class")
## [1] "confint.bas"

plot(confint(coef.model, parm = 2:11))

```

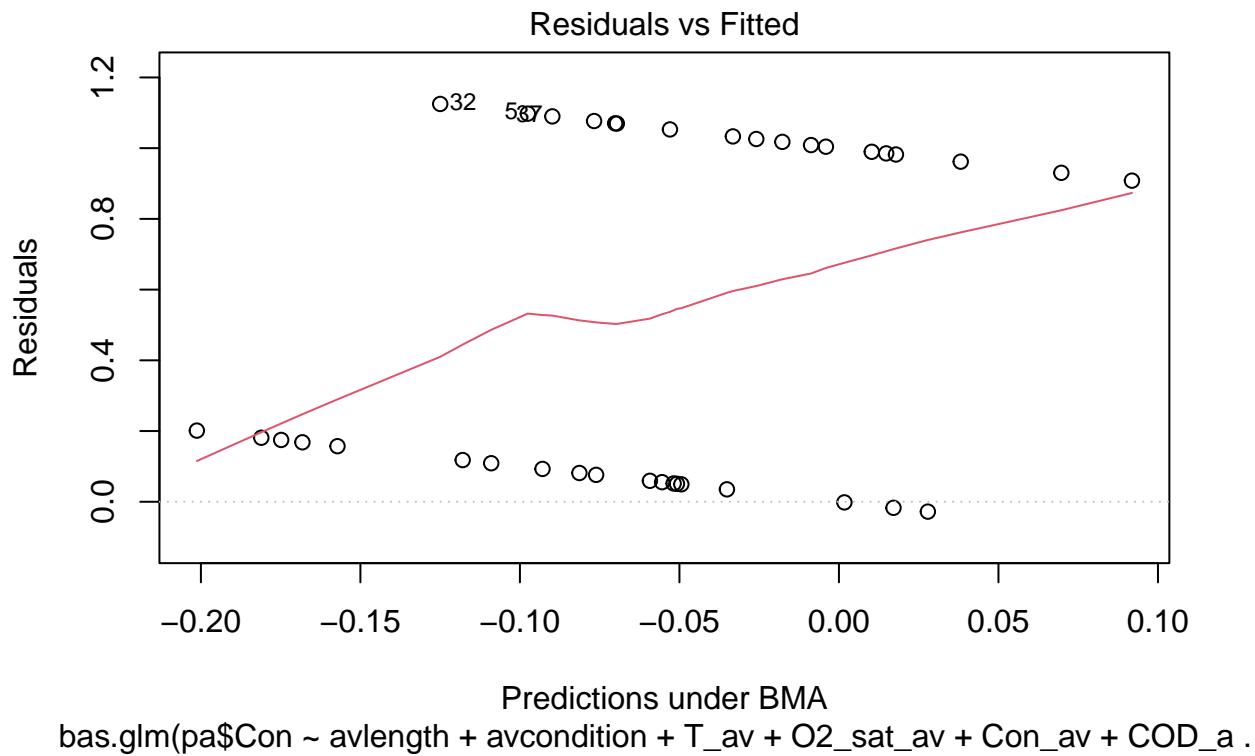


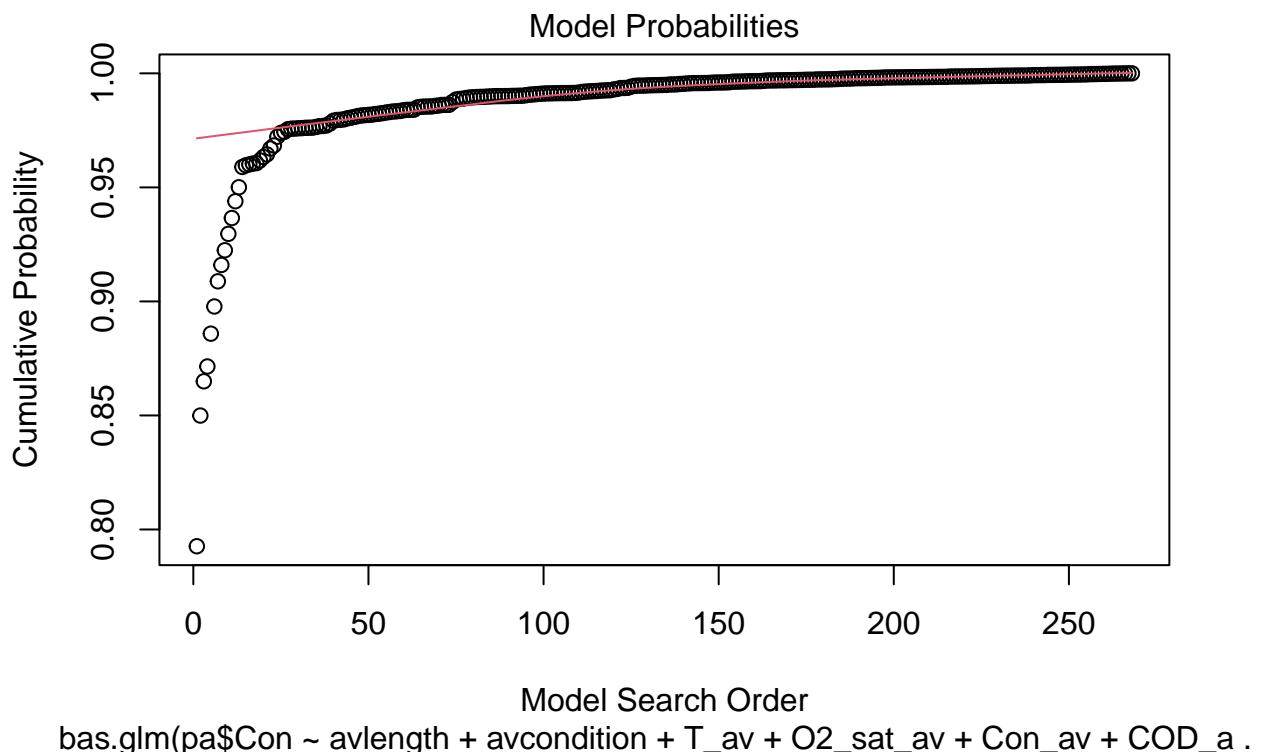
```
## NULL

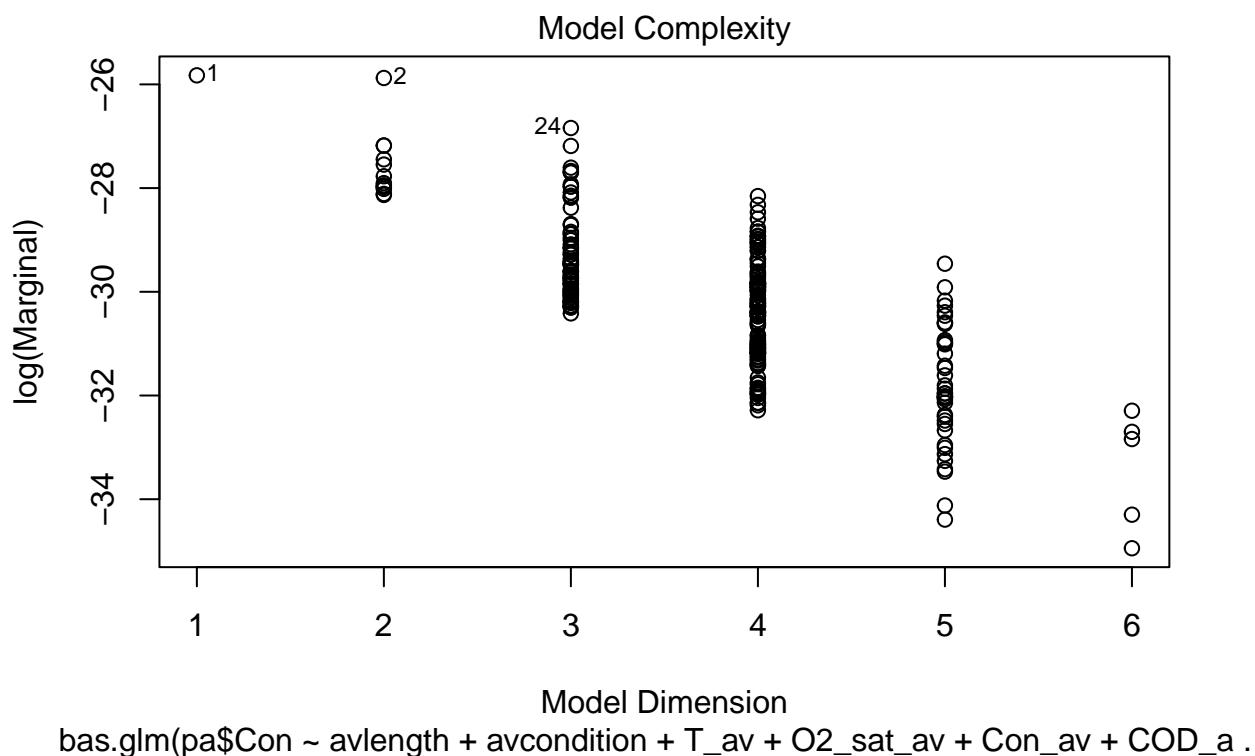
confint <- confint(coef.model, parm = 2:11)
pip <- summary(bas.model)
PIP[c(1:12),9] <- pip[2:13,1]*sign(coef.model$postmean[2:13])
```

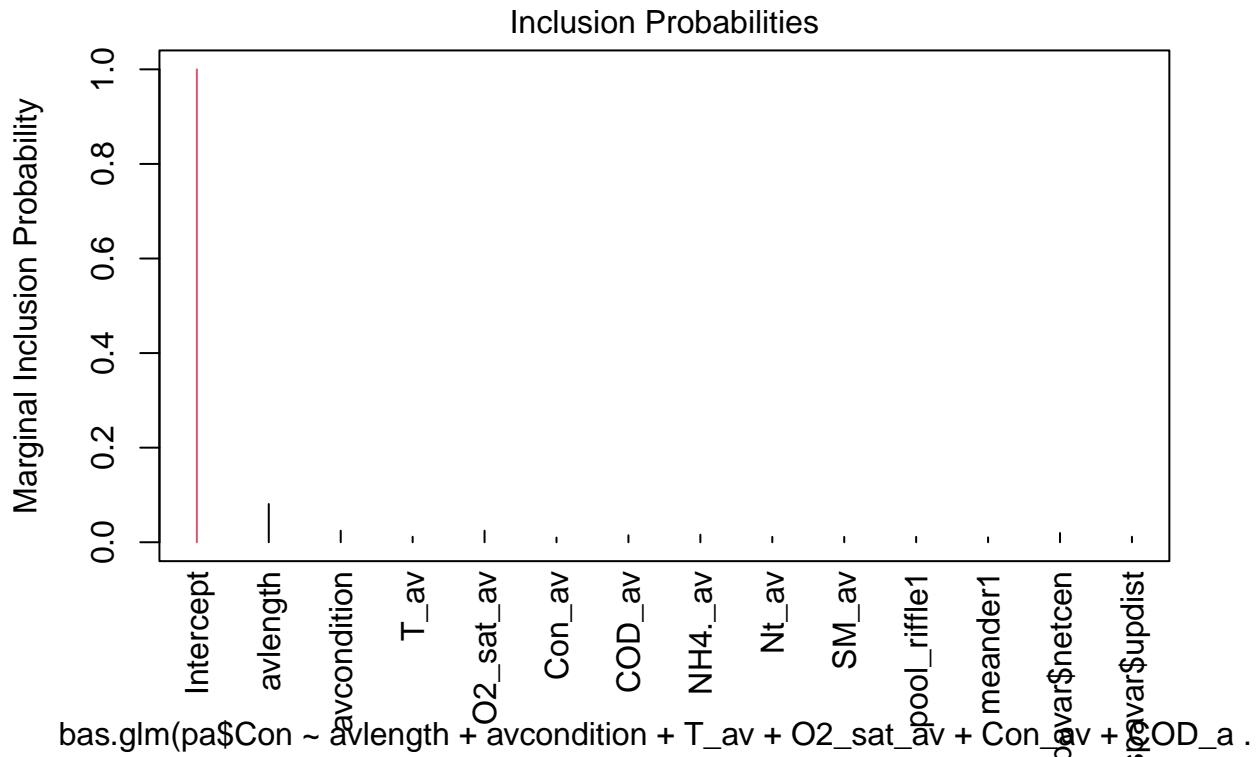
6.5 Variation in Contracaecum infection

```
bas.model <- bas.glm(pa$Con ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av +
                      NH4._av + Nt_av + SM_av + pool_riffle + meander +
                      spavar$netcen + spavar$updist, data=environment2, betaprior=g.prior(100), family=yhat = fitted(bas.model, estimator = "BMA") #these are the fitted values under BMA
r = bas.model$Y - yhat #these are the model residuals
plot(bas.model)
```









```
summary(bas.model)
```

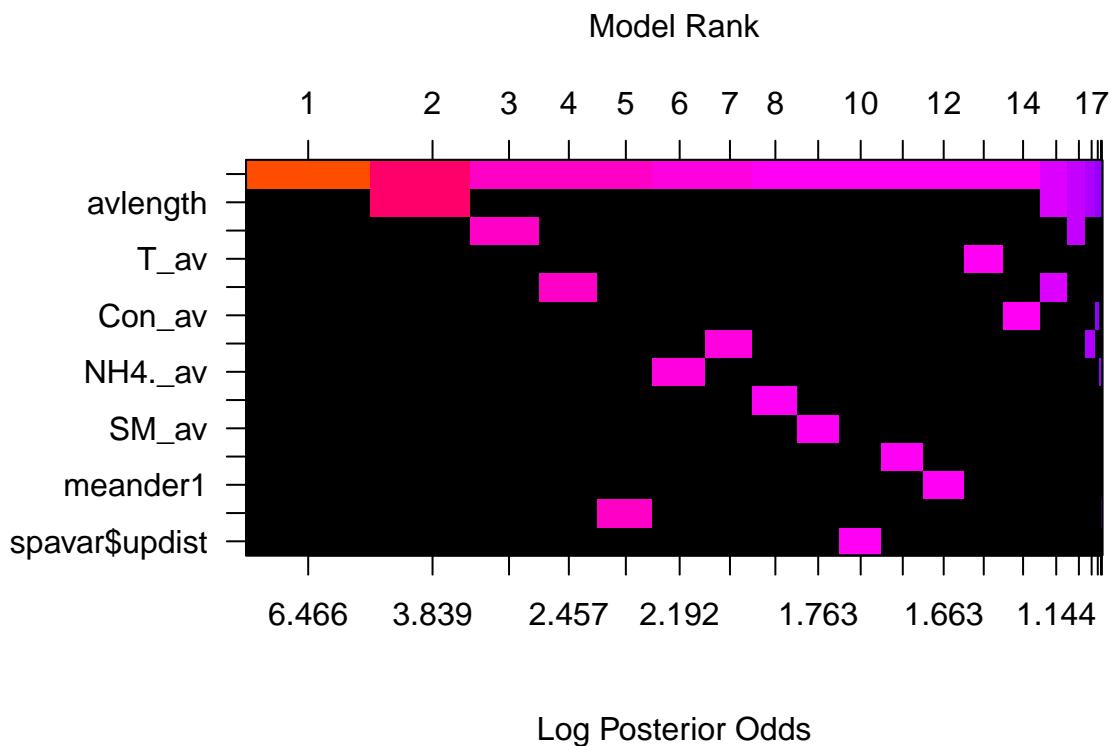
```
##          P(B != 0 | Y)    model 1     model 2     model 3     model 4
## Intercept 1.000000000 1.000000 1.0000000 1.0000000 1.0000000
## avlength  0.080822754 0.00000 1.0000000 0.0000000 0.0000000
## avcondition 0.024401855 0.00000 0.0000000 1.0000000 0.0000000
## T_av      0.011572266 0.00000 0.0000000 0.0000000 0.0000000
## O2_sat_av 0.024475098 0.00000 0.0000000 0.0000000 1.0000000
## Con_av    0.009924316 0.00000 0.0000000 0.0000000 0.0000000
## COD_av    0.014685059 0.00000 0.0000000 0.0000000 0.0000000
## NH4_av    0.015930176 0.00000 0.0000000 0.0000000 0.0000000
## Nt_av     0.011437988 0.00000 0.0000000 0.0000000 0.0000000
## SM_av     0.011340332 0.00000 0.0000000 0.0000000 0.0000000
## pool_riffle1 0.011450195 0.00000 0.0000000 0.0000000 0.0000000
## meander1   0.010351562 0.00000 0.0000000 0.0000000 0.0000000
## spavar$netcen 0.019519043 0.00000 0.0000000 0.0000000 0.0000000
## spavar$updist 0.011584473 0.00000 0.0000000 0.0000000 0.0000000
## BF          NA        1.00000 0.9507459 0.2581488 0.2583995
## PostProbs   NA        0.79270 0.0573000 0.0150000 0.0144000
## R2          NA        0.00000 0.0864000 0.0365000 0.0366000
## dim         NA        1.00000 2.0000000 2.0000000 2.0000000
## logmarg     NA      -25.82594 -25.8764468 -27.1801577 -27.1791867
##                      model 5
## Intercept 1.0000000
## avlength  0.0000000
```

```

## avcondition      0.0000000
## T_av            0.0000000
## O2_sat_av       0.0000000
## Con_av          0.0000000
## COD_av          0.0000000
## NH4._av         0.0000000
## Nt_av           0.0000000
## SM_av           0.0000000
## pool_riffle1    0.0000000
## meander1        0.0000000
## spavar$netcen   1.0000000
## spavar$updist   0.0000000
## BF              0.1788741
## PostProbs       0.0119000
## R2              0.0225000
## dim             2.0000000
## logmarg         -27.5470115

```

```
image(bas.model, rotate=F)
```



```
coef.model <- coef(bas.model)
```

```

## Warning in object$prior == "AIC" || object$prior == "BIC": 'length(x) = 268 > 1'
## in coercion to 'logical(1)'

```

```

## Warning in object$prior == "AIC" || object$prior == "BIC": 'length(x) = 268 > 1'
## in coercion to 'logical(1)'

abs(coef.model$postmean)-2*coef.model$postsd > 0

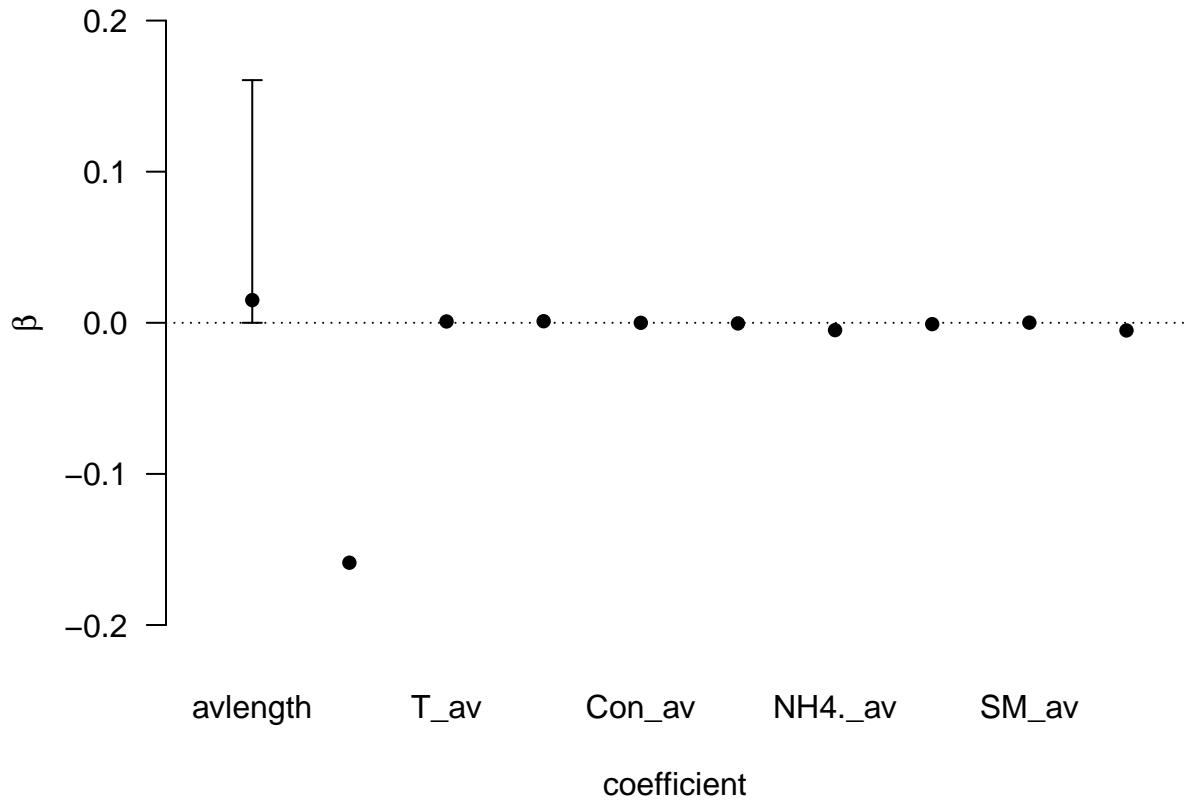
## [1] FALSE FALSE
## [13] FALSE FALSE

confint(coef.model)

##              2.5%      97.5%          beta
## Intercept     -8.950328 2.4053641 -5.414403e-01
## avlength      0.000000 0.1458728  1.501017e-02
## avcondition   0.000000 0.0000000 -1.587761e-01
## T_av          0.000000 0.0000000  8.866110e-04
## O2_sat_av    0.000000 0.0000000  1.035044e-03
## Con_av        0.000000 0.0000000  4.378543e-06
## COD_av        0.000000 0.0000000 -3.973774e-04
## NH4._av       0.000000 0.0000000 -4.850394e-03
## Nt_av          0.000000 0.0000000 -8.742933e-04
## SM_av          0.000000 0.0000000  1.092815e-04
## pool_riffle1  0.000000 0.0000000 -5.058872e-03
## meander1       0.000000 0.0000000  2.974938e-03
## spavar$netcen 0.000000 0.0000000 -8.032614e-07
## spavar$updist  0.000000 0.0000000 -1.078938e-07
## attr(),"Probability")
## [1] 0.95
## attr(),"class")
## [1] "confint.bas"

plot(confint(coef.model, parm = 2:11))

```

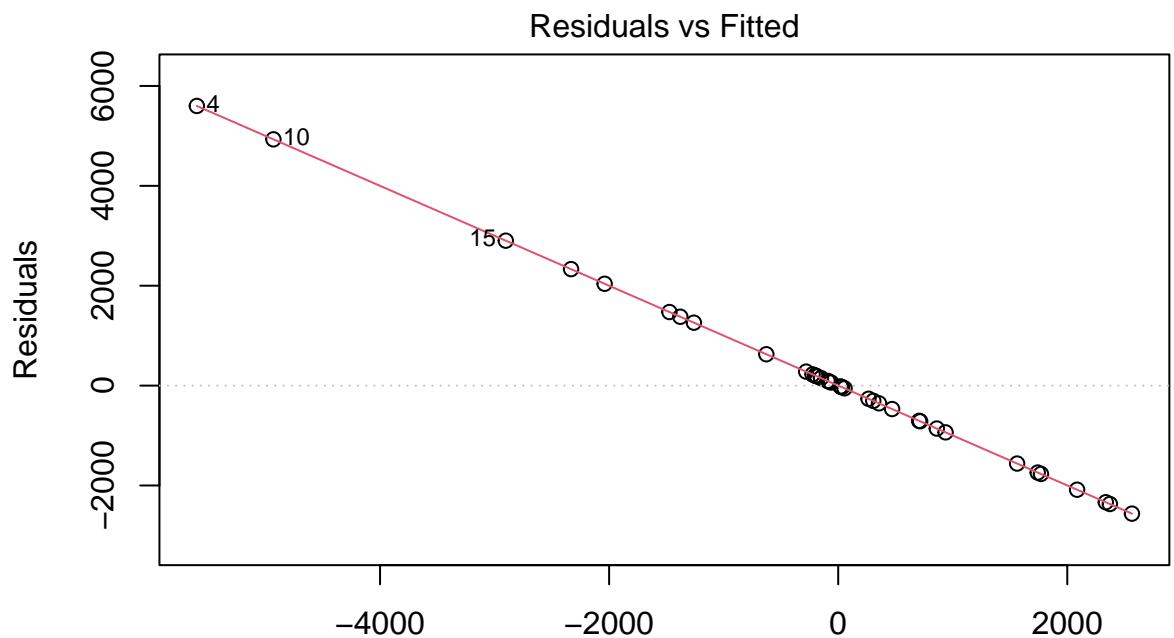


```
## NULL

confint <- confint(coef.model, parm = 2:11)
pip <- summary(bas.model)
PIP[c(1:12),10] <- pip[2:13,1]*sign(coef.model$postmean[2:13])
```

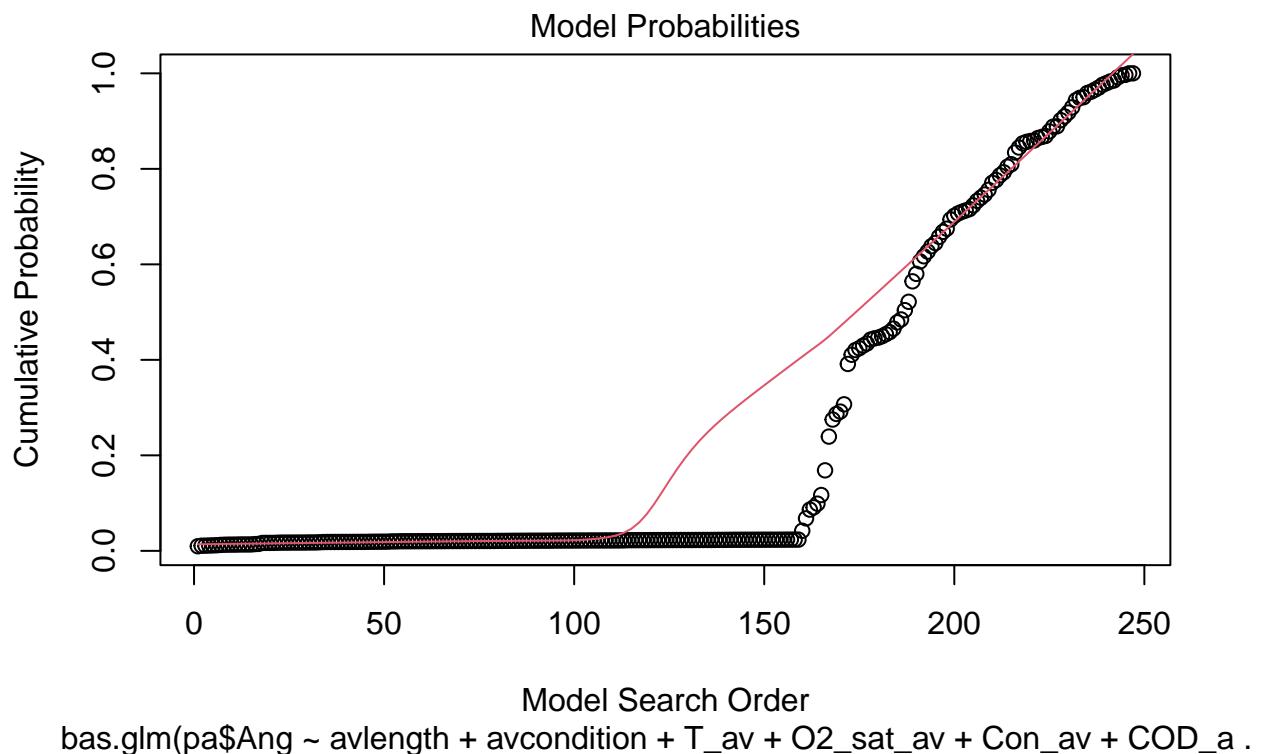
Variation in Anguillicoloides infection

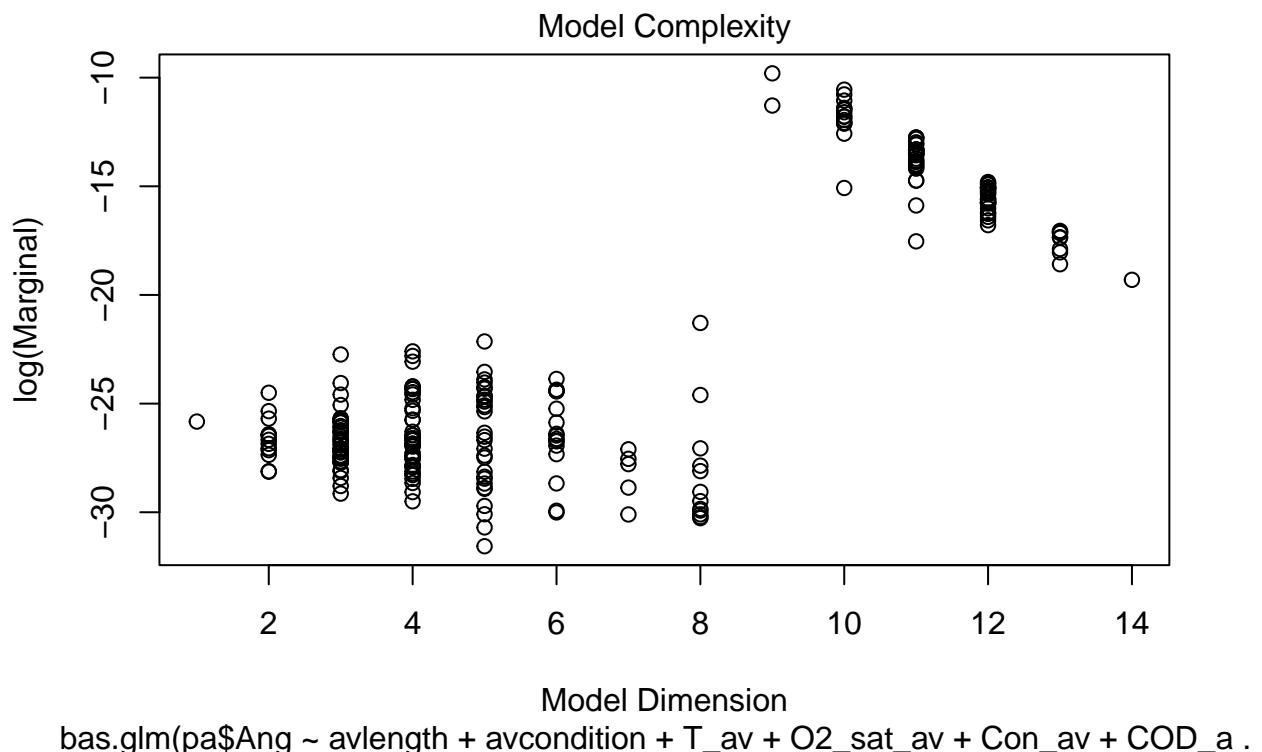
```
bas.model <- bas.glm(pa$Ang ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av +
                      NH4._av + Nt_av + SM_av + pool_riffle + meander +
                      spavar$netcen + spavar$updist, data=environment2, betaprior=g.prior(100), family=yhat = fitted(bas.model, estimator = "BMA") #these are the fitted values under BMA
r = bas.model$Y - yhat #these are the model residuals
plot(bas.model)
```

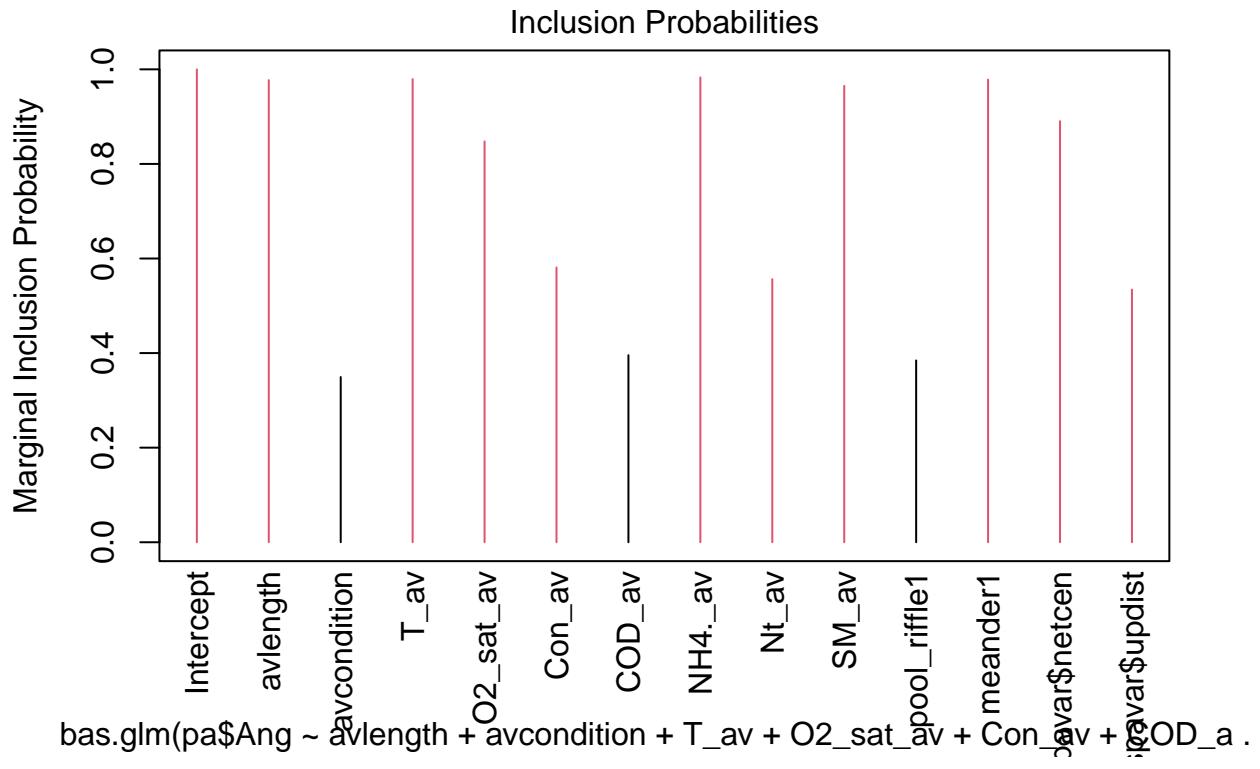


Predictions under BMA

bas.glm(pa\$Ang ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_a .







```
summary(bas.model)
```

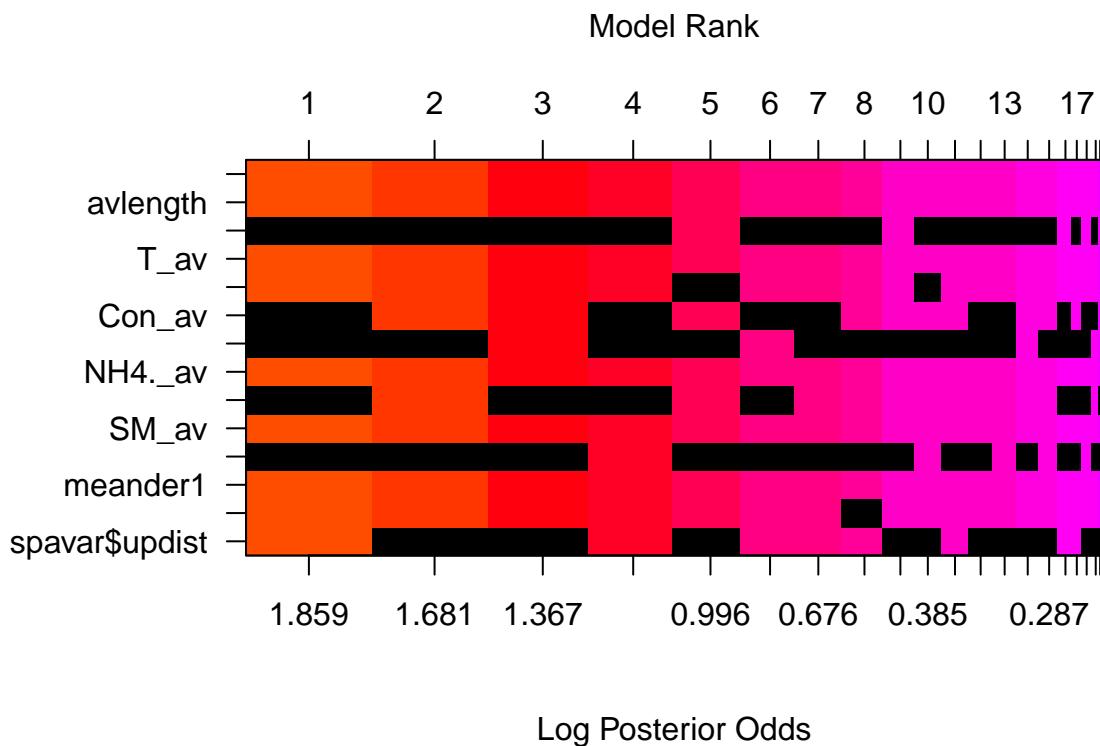
```
##          P(B != 0 | Y)    model 1    model 2    model 3    model 4
## Intercept      1.0000000  1.000000  1.0000000  1.0000000  1.0000000
## avlength       0.9772827  1.000000  1.0000000  1.0000000  1.0000000
## avcondition    0.3494019  0.000000  0.0000000  0.0000000  0.0000000
## T_av           0.9794434  1.000000  1.0000000  1.0000000  1.0000000
## O2_sat_av      0.8476318  1.000000  1.0000000  1.0000000  1.0000000
## Con_av          0.5811157  0.000000  1.0000000  1.0000000  0.0000000
## COD_av          0.3956421  0.000000  0.0000000  1.0000000  0.0000000
## NH4_av          0.9829590  1.000000  1.0000000  1.0000000  1.0000000
## Nt_av           0.5562378  0.000000  1.0000000  0.0000000  0.0000000
## SM_av           0.9651611  1.000000  1.0000000  1.0000000  1.0000000
## pool_riffle1    0.3845215  0.000000  0.0000000  0.0000000  1.0000000
## meander1         0.9783325  1.000000  1.0000000  1.0000000  1.0000000
## spavar$netcen   0.8904053  1.000000  1.0000000  1.0000000  1.0000000
## spavar$updist   0.5344482  1.000000  0.0000000  0.0000000  1.0000000
## BF                 NA  1.000000  0.4728289  0.3794633  0.2858158
## PostProbs        NA  0.084500  0.0707000  0.0517000  0.0428000
## R2                 NA  1.000000  1.0000000  1.0000000  1.0000000
## dim                NA  9.000000  10.0000000 10.0000000 10.0000000
## logmarg            NA -9.802499 -10.5515211 -10.7714968 -11.0549070
##          model 5
## Intercept      1.0000000
## avlength       1.0000000
```

```

## avcondition      1.0000000
## T_av            1.0000000
## O2_sat_av       0.0000000
## Con_av          1.0000000
## COD_av          0.0000000
## NH4._av         1.0000000
## Nt_av           1.0000000
## SM_av           1.0000000
## pool_riffle1    0.0000000
## meander1        1.0000000
## spavar$netcen   1.0000000
## spavar$updist   0.0000000
## BF              0.2037316
## PostProbs       0.0357000
## R2              1.0000000
## dim             10.0000000
## logmarg         -11.3934513

```

```
image(bas.model, rotate=F)
```



```
coef.model <- coef(bas.model)
```

```

## Warning in object$prior == "AIC" || object$prior == "BIC": 'length(x) = 247 > 1'
## in coercion to 'logical(1)'

```

```

## Warning in object$prior == "AIC" || object$prior == "BIC": 'length(x) = 247 > 1'
## in coercion to 'logical(1)'

abs(coef.model$postmean)-2*coef.model$postsd > 0

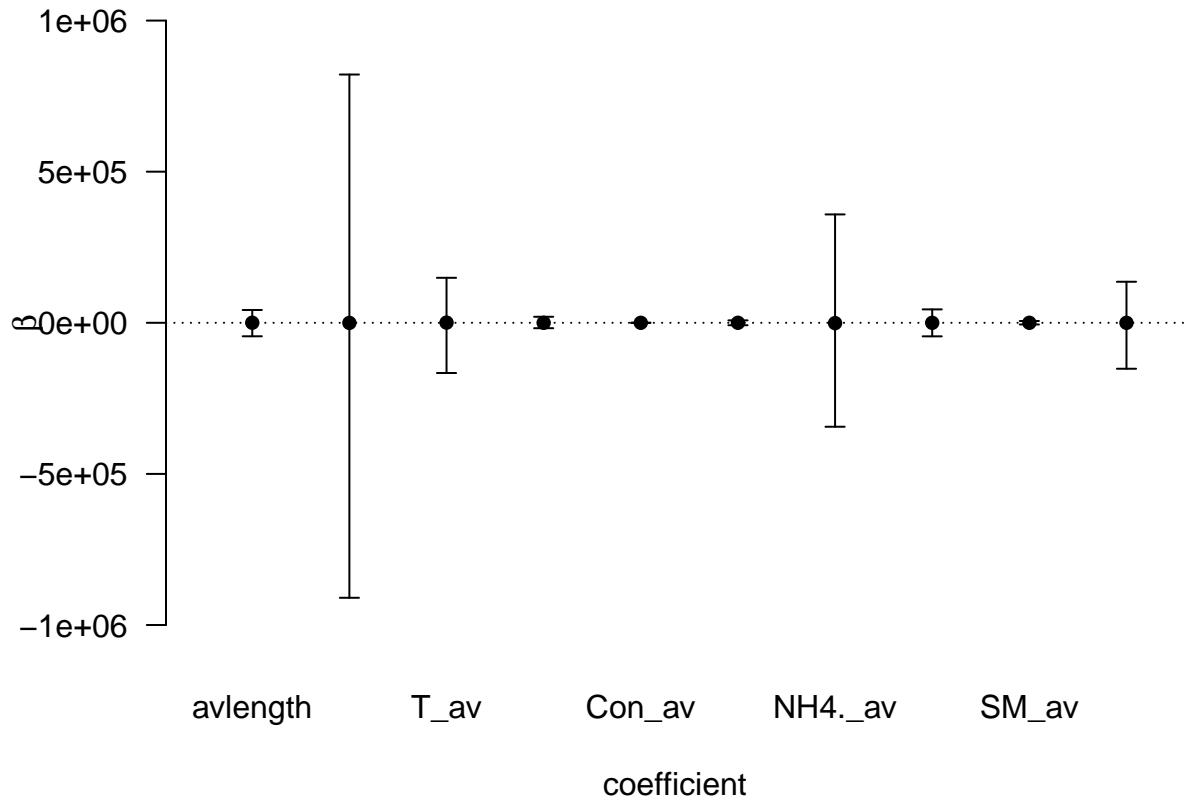
## [1] FALSE FALSE
## [13] FALSE FALSE

confint(coef.model)

##              2.5%      97.5%       beta
## Intercept    -2.321144e+06 2.313242e+06 -6.585205e+03
## avlength     -4.609129e+04 4.374984e+04  1.352464e+02
## avcondition   -8.748686e+05 7.814422e+05 -3.402057e+02
## T_av          -1.542587e+05 1.579983e+05  6.053424e+02
## O2_sat_av    -1.802158e+04 1.945522e+04 -3.866345e+01
## Con_av        -6.468361e+02 6.623657e+02  3.750193e-01
## COD_av        -8.342021e+03 7.639444e+03  1.760995e+00
## NH4._av       -3.279539e+05 3.627668e+05 -1.085374e+03
## Nt_av          -4.844612e+04 4.226711e+04 -4.655438e+01
## SM_av          -5.257983e+03 6.331439e+03  1.326137e+01
## pool_riffle1  -1.425529e+05 1.422480e+05 -1.271276e+02
## meander1       -3.964024e+05 3.919774e+05 -1.425500e+03
## spavar$netcen -1.458824e+01 1.401654e+01 -2.840000e-02
## spavar$updist  -3.050128e+00 3.771988e+00  1.323942e-03
## attr(),"Probability")
## [1] 0.95
## attr(),"class")
## [1] "confint.bas"

plot(confint(coef.model, parm = 2:11))

```

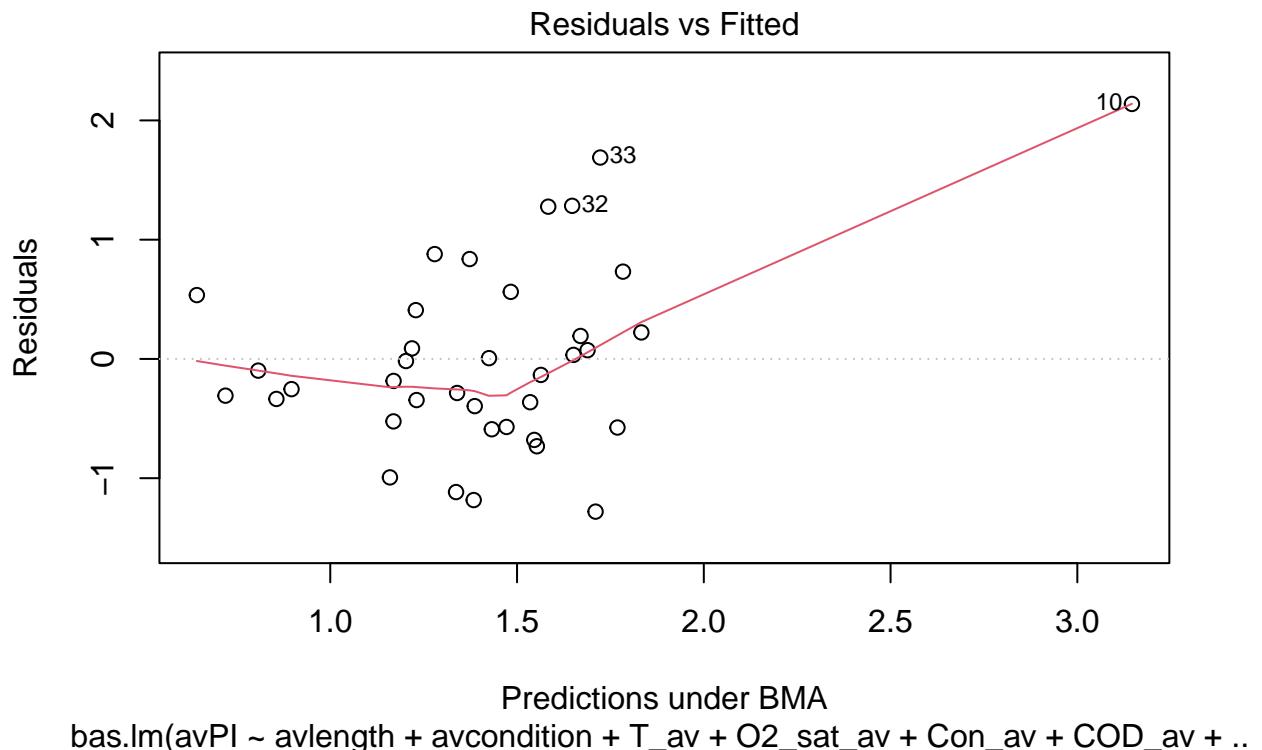


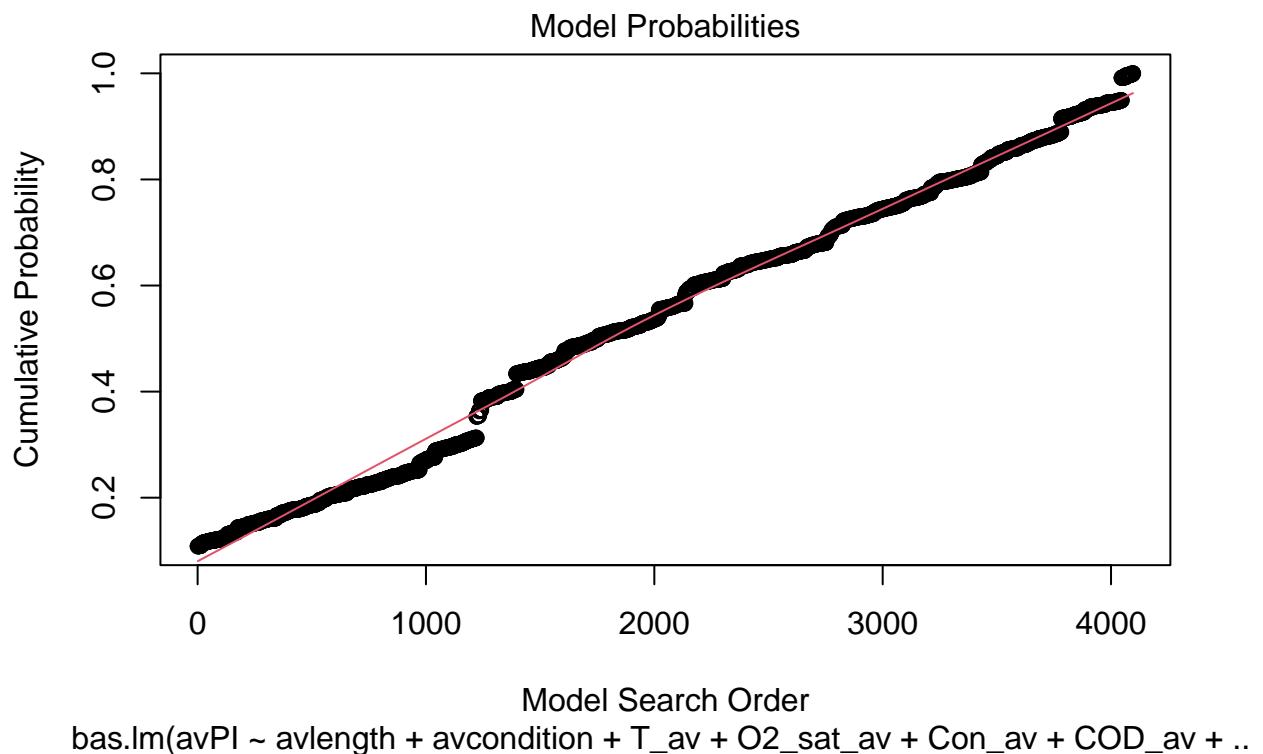
```
## NULL

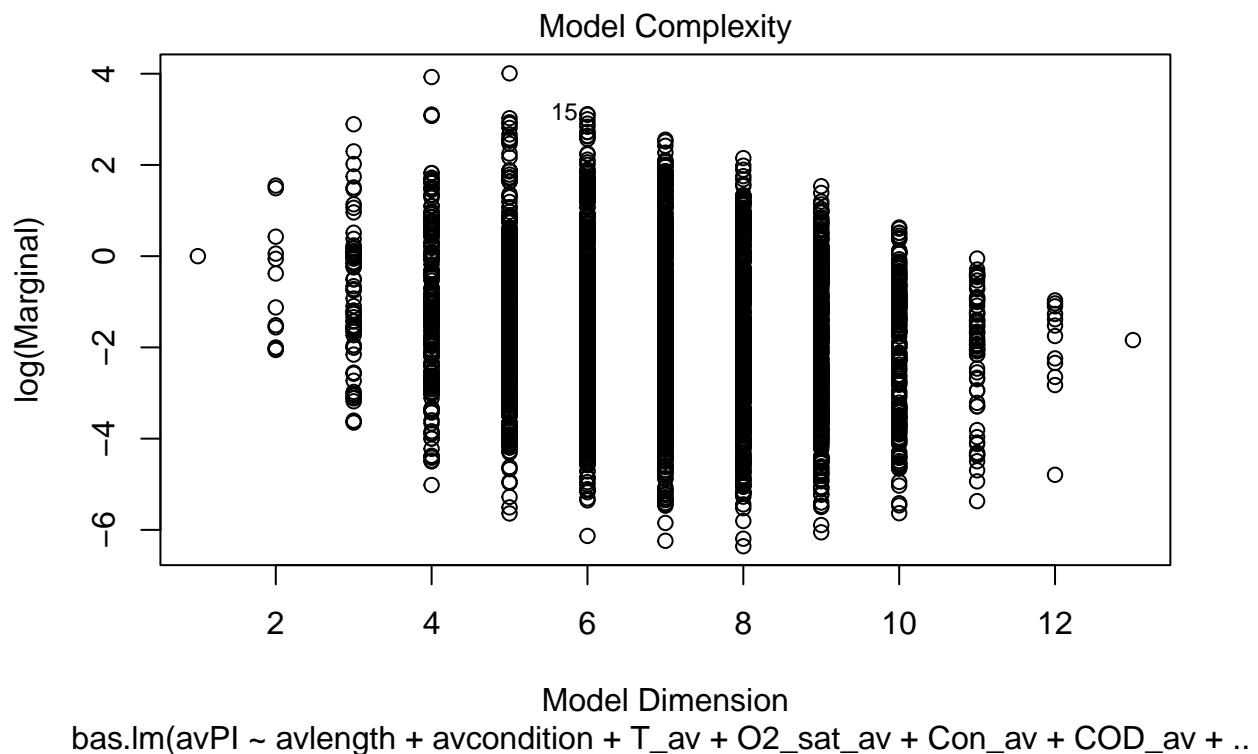
confint <- confint(coef.model, parm = 2:11)
pip <- summary(bas.model)
PIP[c(1:12),11] <- pip[2:13,1]*sign(coef.model$postmean[2:13])
```

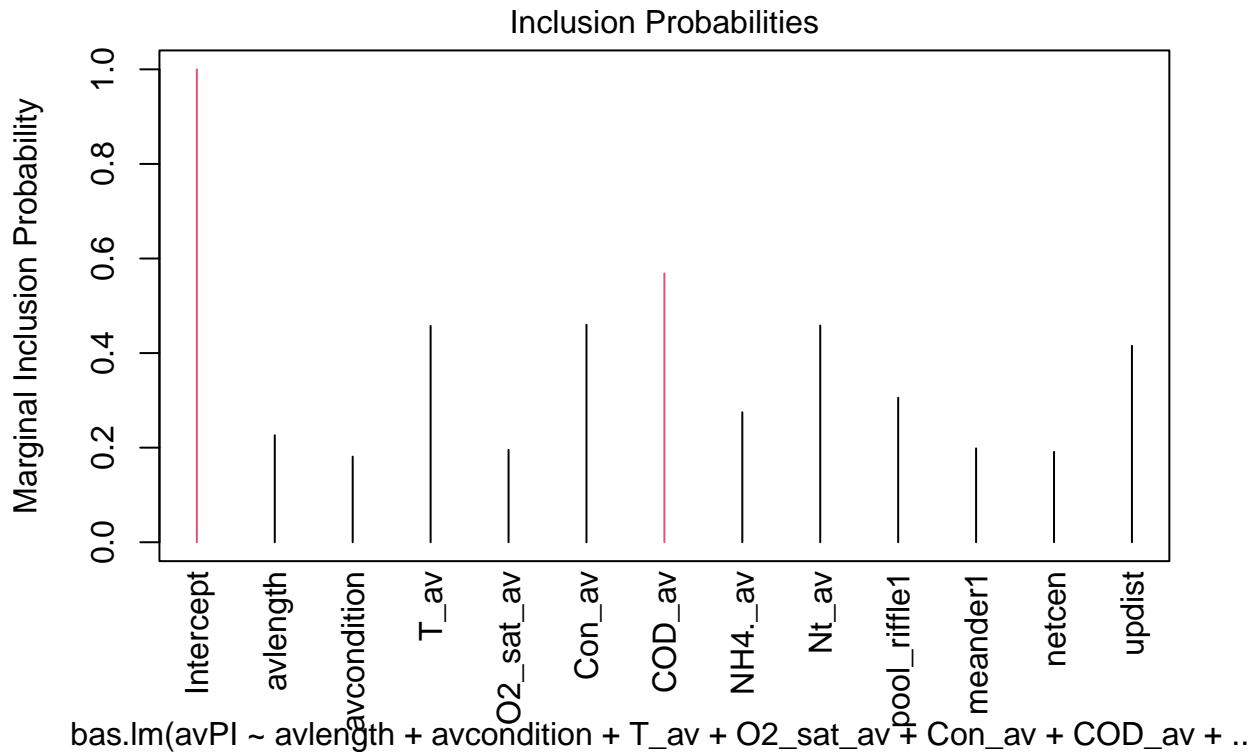
Variation in Individual Parasitization Index (all parasites)

```
bas.model <- bas.lm(avPI ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
+ NH4._av + Nt_av + pool_riffle + meander + netcen +
updist, data=environment2, prior="JZS")
yhat = fitted(bas.model, estimator = "BMA") #these are the fitted values under BMA
r = bas.model$Y - yhat #these are the model residuals
plot(bas.model)
```





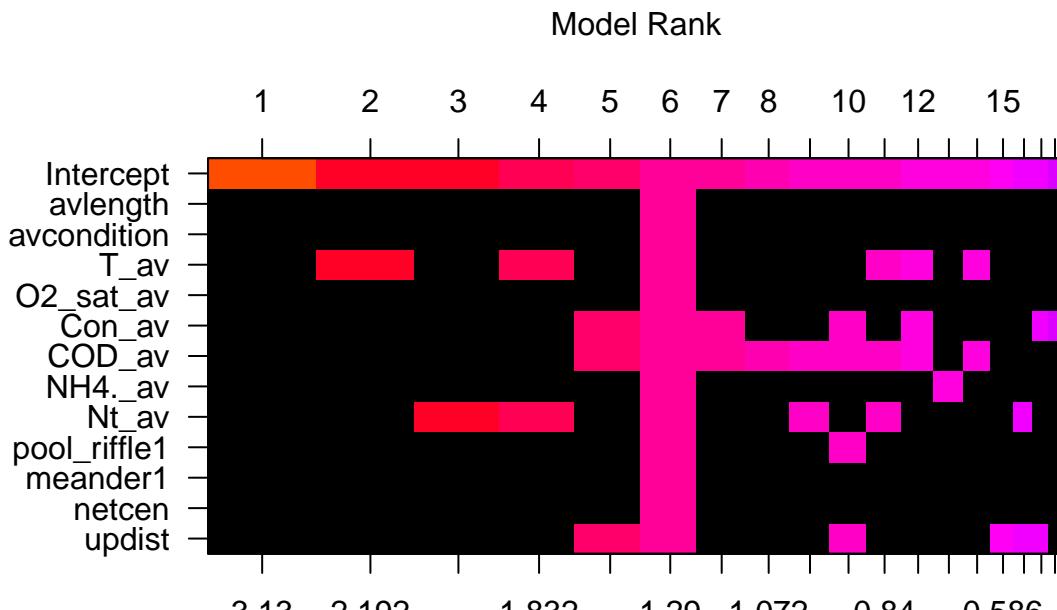




```
summary(bas.model)
```

	P(B != 0 Y)	model 1	model 2	model 3	model 4	model 5
## Intercept	1.0000000	1.0000000	1.0000000	1.0000000	1.000000	1.000000
## avlength	0.2261960	0.0000000	0.0000000	0.0000000	0.000000	0.000000
## avcondition	0.1810890	0.0000000	0.0000000	0.0000000	0.000000	0.000000
## T_av	0.4574073	0.0000000	1.0000000	0.0000000	1.000000	0.000000
## O2_sat_av	0.1952767	0.0000000	0.0000000	0.0000000	0.000000	0.000000
## Con_av	0.4598919	0.0000000	0.0000000	0.0000000	0.000000	1.000000
## COD_av	0.5684747	0.0000000	0.0000000	0.0000000	0.000000	1.000000
## NH4_av	0.2748144	0.0000000	0.0000000	0.0000000	0.000000	0.000000
## Nt_av	0.4582802	0.0000000	0.0000000	1.0000000	1.000000	0.000000
## pool_riffle1	0.3054914	0.0000000	0.0000000	0.0000000	0.000000	0.000000
## meander1	0.1985617	0.0000000	0.0000000	0.0000000	0.000000	0.000000
## netcen	0.1910872	0.0000000	0.0000000	0.0000000	0.000000	0.000000
## updist	0.4153657	0.0000000	0.0000000	0.0000000	0.000000	1.000000
## BF	NA	0.01969453	0.09251289	0.08737546	0.355023	1.000000
## PostProbs	NA	0.10850000	0.04250000	0.04010000	0.029600	0.025000
## R2	NA	0.00000000	0.18980000	0.18710000	0.325400	0.424800
## dim	NA	1.00000000	2.00000000	2.00000000	3.000000	4.000000
## logmarg	NA	0.00000000	1.54700725	1.48987379	2.891842	3.927415

```
image(bas.model, rotate=F)
```



Log Posterior Odds

```
coef.model <- coef(bas.model)
abs(coef.model$postmean)-2*coef.model$postsd > 0
```

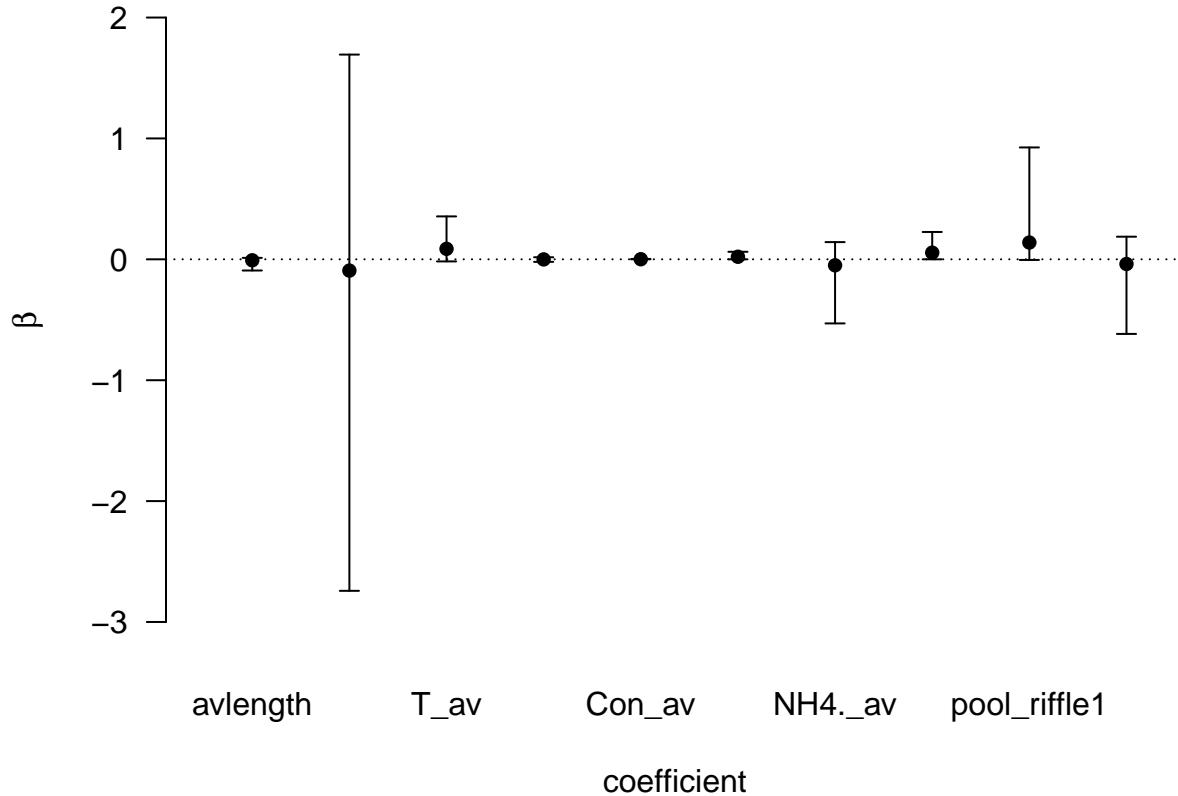
```
## [1] TRUE FALSE FALSE
## [13] FALSE
```

```
confint(coef.model)
```

```
##              2.5%      97.5%       beta
## Intercept  1.120920e+00 1.722790e+00 1.422090e+00
## avlength   -8.843633e-02 1.311498e-02 -7.992245e-03
## avcondition -2.761775e+00 1.791861e+00 -9.325811e-02
## T_av        0.000000e+00 3.764985e-01  8.644408e-02
## O2_sat_av  -2.460984e-02 1.441969e-02 -7.476618e-04
## Con_av     0.000000e+00 3.191779e-03  8.405554e-04
## COD_av    -2.897751e-05 6.001945e-02  2.109188e-02
## NH4_.av   -5.441150e-01 1.499523e-01 -4.965441e-02
## Nt_av     -2.150921e-03 2.236567e-01  5.507750e-02
## pool_riffle1 -1.074000e-03 9.224258e-01  1.389140e-01
## meander1   -6.371776e-01 1.371367e-01 -3.866036e-02
## netcen     -2.987602e-05 1.921678e-05 -1.270941e-06
## updist     -2.676813e-05 2.100123e-08 -5.952452e-06
## attr(),"Probability")
## [1] 0.95
## attr(),"class")
```

```
## [1] "confint.bas"
```

```
plot(confint(coef.model, parm = 2:11))
```



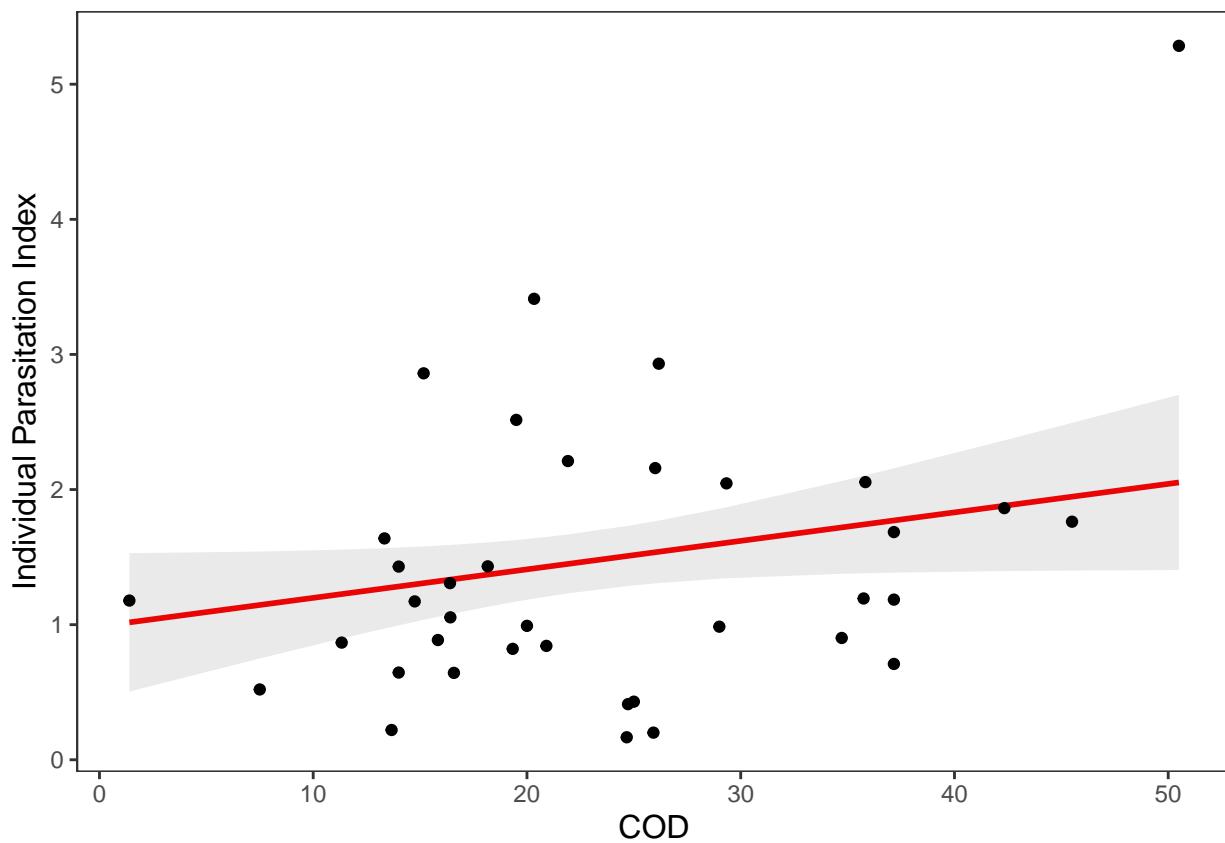
```
## NULL
```

```
confint <- confint(coef.model, parm = 2:11)
pip <- summary(bas.model)
PIP[c(1:12),12] <- pip[2:13,1]*sign(coef.model$postmean[2:13])
```

Prediction plot for marginal effect of COD on Individual Parasitation Index

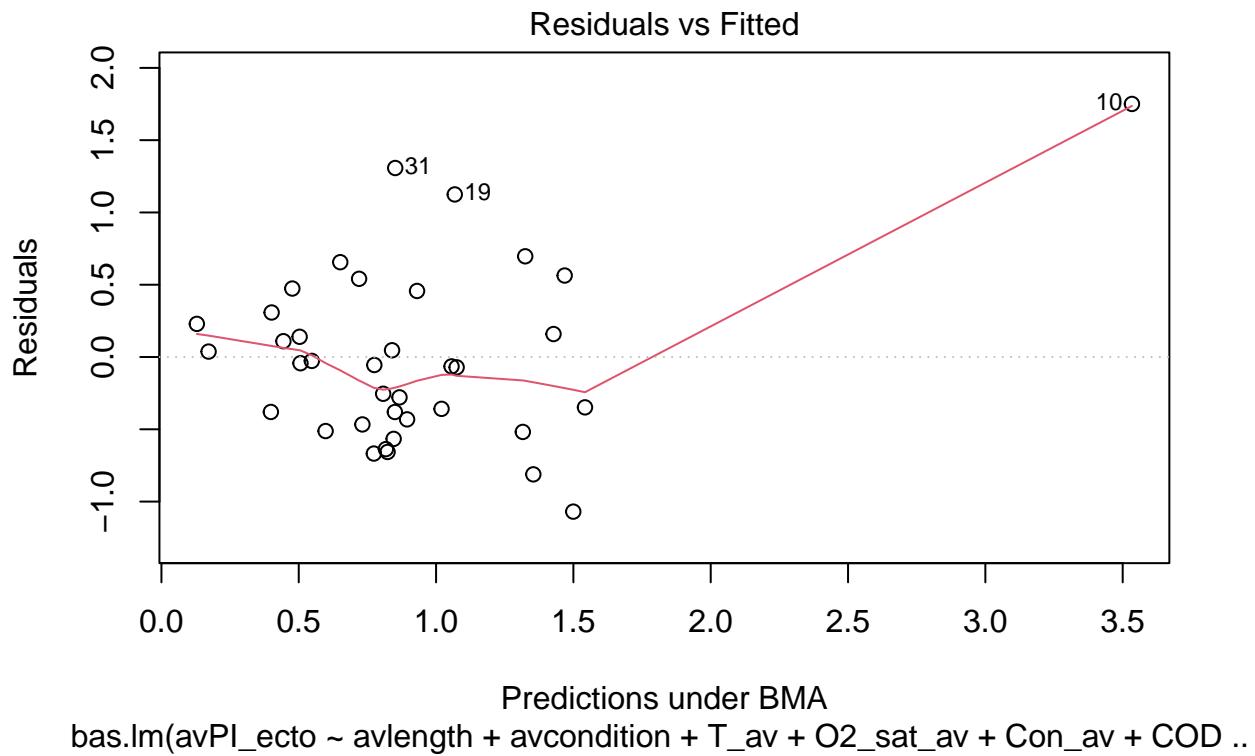
```
newdata1 <- newdata; newdata1[, "COD_av"] <- environment2$COD_av
BMA <- predict(bas.model, newdata = newdata1, estimator = "BMA", se.fit=TRUE)
ggplot(environment2, aes(COD_av, BMA$fit)) +
  theme_bw() +
  geom_line(color="red", size=1) +
  geom_ribbon(aes(ymin = (BMA$fit-BMA$se.bma.fit), ymax = (BMA$fit+BMA$se.bma.fit)), alpha = .1) +
  geom_point(data = environment2, aes(x=COD_av, y=avPI)) +
  labs(x=expression("COD"), y=expression("Individual Parasitization Index")) +
```

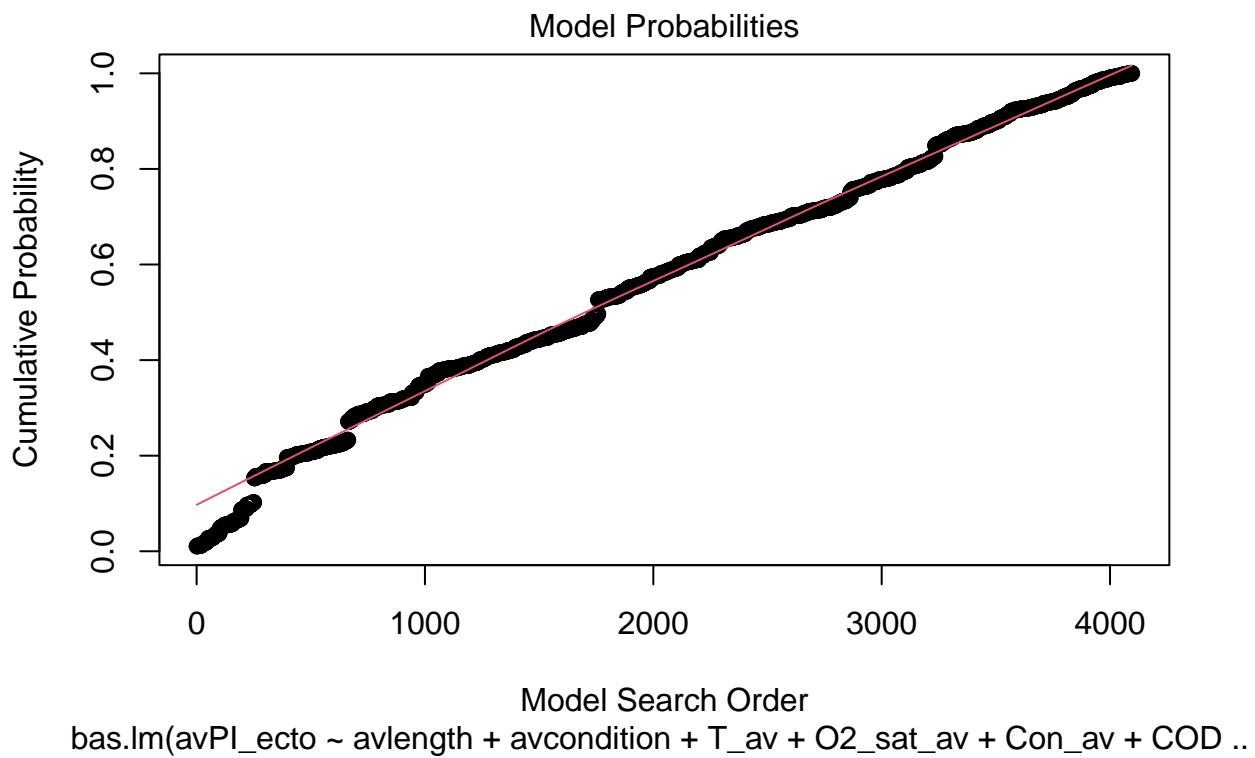
```
theme(axis.title.x = element_text(size=12),
      axis.title.y = element_text(size=12)) + theme(panel.grid.major = element_blank(), panel.grid.minor = element_blank())
```

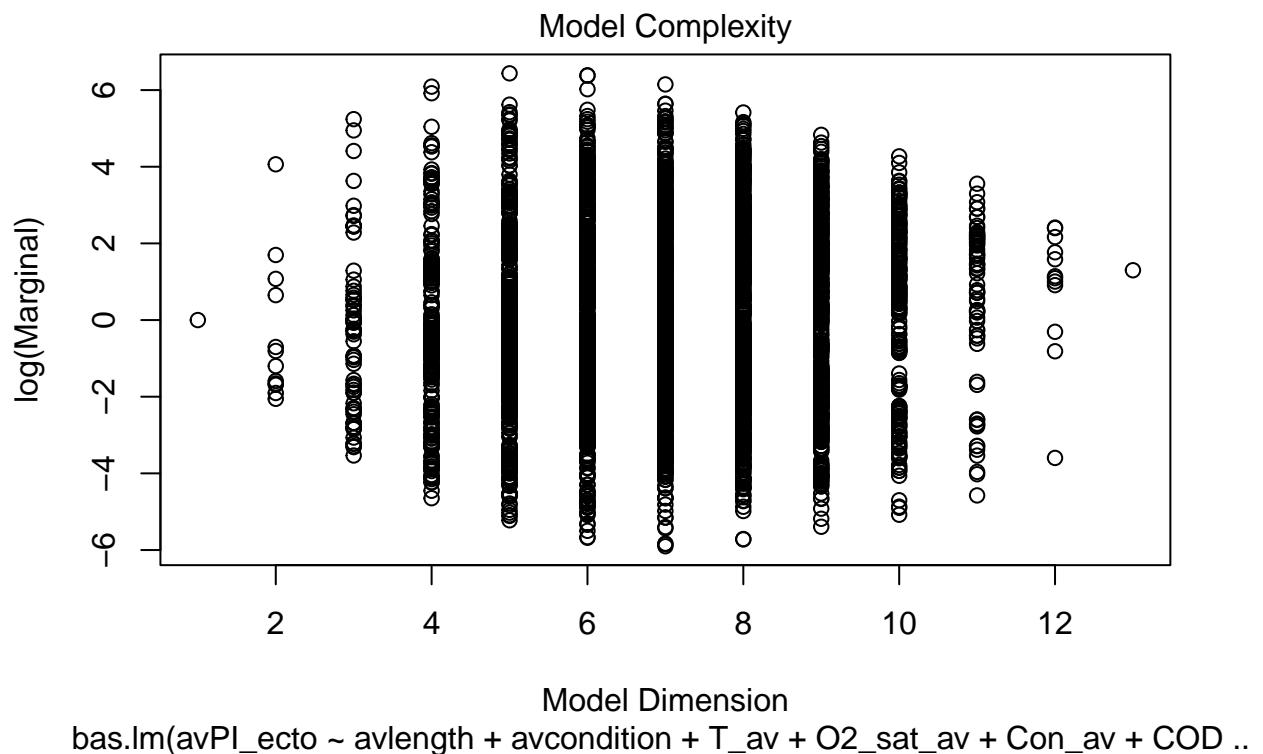


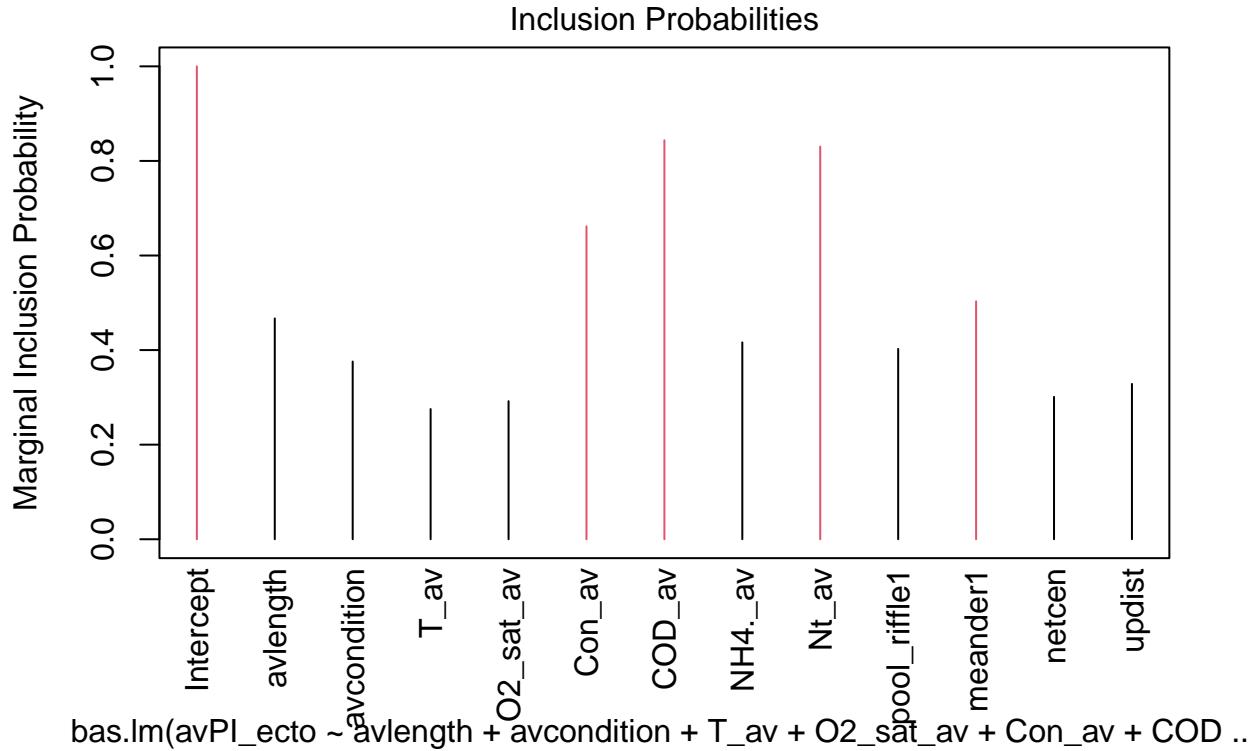
Variation in Individual Parasitization Index (only ectoparasites)

```
bas.model <- bas.lm(avPI_ecto ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
+ NH4_av + Nt_av + pool_riffle + meander + netcen +
updist, data=environment2, prior="JZS")
yhat = fitted(bas.model, estimator = "BMA") #these are the fitted values under BMA
r = bas.model$Y - yhat #these are the model residuals
plot(bas.model)
```





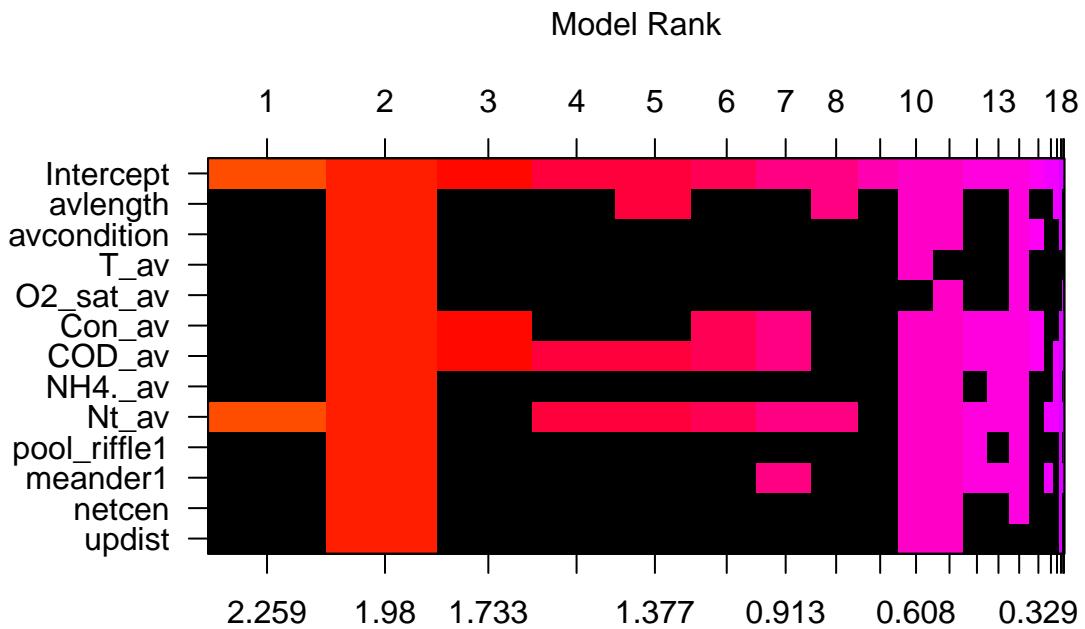




```
summary(bas.model)
```

	P(B != 0 Y)	model 1	model 2	model 3	model 4	model 5
## Intercept	1.0000000	1.0000000	1.000000000	1.0000000	1.0000000	1.0000000
## avlength	0.4669536	0.0000000	1.000000000	0.0000000	0.0000000	1.0000000
## avcondition	0.3758074	0.0000000	1.000000000	0.0000000	0.0000000	0.0000000
## T_av	0.2753561	0.0000000	1.000000000	0.0000000	0.0000000	0.0000000
## O2_sat_av	0.2919614	0.0000000	1.000000000	0.0000000	0.0000000	0.0000000
## Con_av	0.6617062	0.0000000	1.000000000	1.0000000	0.0000000	0.0000000
## COD_av	0.8437205	0.0000000	1.000000000	1.0000000	1.0000000	1.0000000
## NH4_av	0.4163705	0.0000000	1.000000000	0.0000000	0.0000000	0.0000000
## Nt_av	0.8302866	1.0000000	1.000000000	0.0000000	1.0000000	1.0000000
## pool_riffle1	0.4025108	0.0000000	1.000000000	0.0000000	0.0000000	0.0000000
## meander1	0.5031625	0.0000000	1.000000000	0.0000000	0.0000000	0.0000000
## netcen	0.3010717	0.0000000	1.000000000	0.0000000	0.0000000	0.0000000
## updist	0.3285744	0.0000000	1.000000000	0.0000000	0.0000000	0.0000000
## BF	NA	0.1318791	0.008313608	0.4282678	0.319205	1.0000000
## PostProbs	NA	0.0510000	0.038600000	0.0301000	0.022500	0.021100
## R2	NA	0.3007000	0.682800000	0.4141000	0.403700	0.496600
## dim	NA	2.0000000	13.000000000	3.0000000	3.0000000	4.0000000
## logmarg	NA	4.0635523	1.299560343	5.2414154	4.947500	6.089422

```
image(bas.model, rotate=F)
```



Log Posterior Odds

```
coef.model <- coef(bas.model)
abs(coef.model$postmean)-2*coef.model$postsd > 0
```

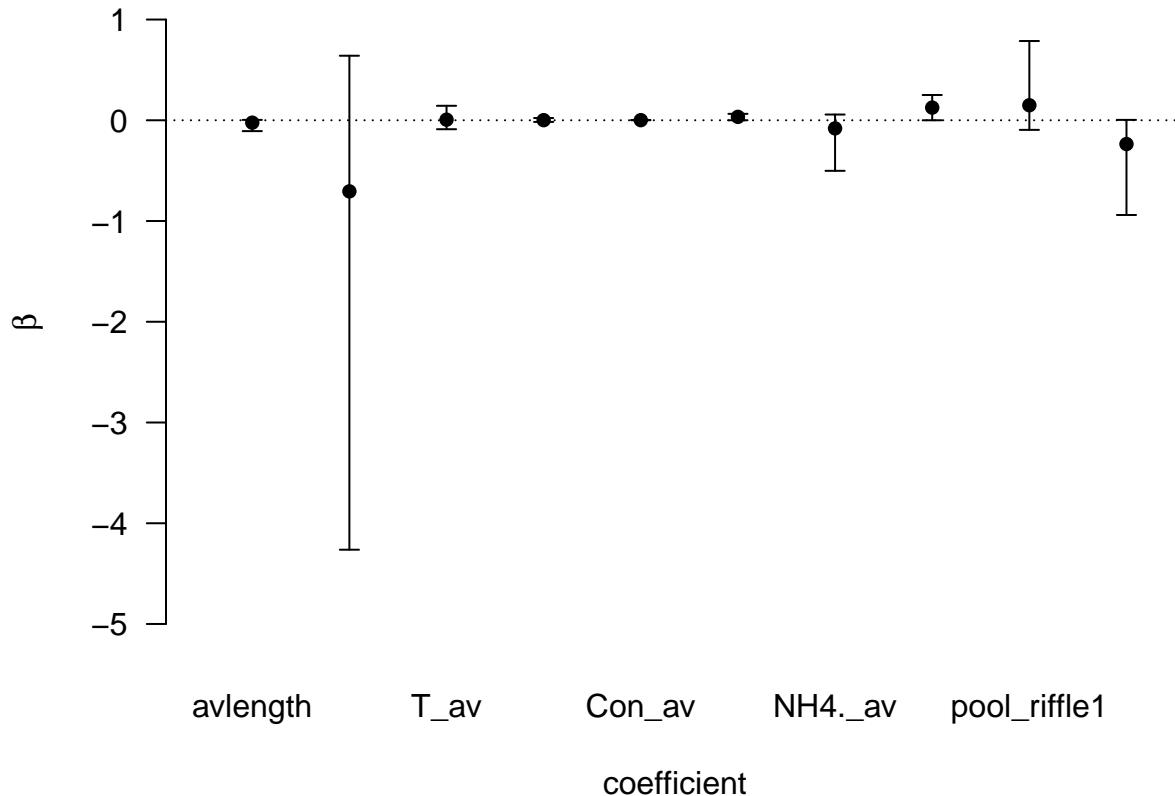
```
## [1] TRUE FALSE FALSE
## [13] FALSE
```

```
confint(coef.model)
```

```
##              2.5%      97.5%       beta
## Intercept  6.876214e-01 1.158105e+00 9.199577e-01
## avlength   -1.078859e-01 4.989266e-03 -2.357999e-02
## avcondition -4.458922e+00 4.020486e-01 -7.055549e-01
## T_av        -1.004123e-01 1.307552e-01 5.818763e-03
## O2_sat_av   -1.699453e-02 2.134859e-02 1.122707e-03
## Con_av      0.000000e+00 3.191328e-03 1.203349e-03
## COD_av      0.000000e+00 6.387347e-02 3.405818e-02
## NH4._av     -5.122807e-01 7.259917e-02 -8.034086e-02
## Nt_av        0.000000e+00 2.517725e-01 1.257830e-01
## pool_riffle1 -1.230046e-01 7.813111e-01 1.490513e-01
## meander1    -9.607152e-01 1.172880e-03 -2.358742e-01
## netcen       -3.528959e-05 1.998159e-05 -2.447510e-06
## updist      -1.551845e-05 3.391724e-06 -1.836166e-06
## attr(),"Probability")
## [1] 0.95
## attr(),"class")
```

```
## [1] "confint.bas"
```

```
plot(confint(coef.model, parm = 2:11))
```



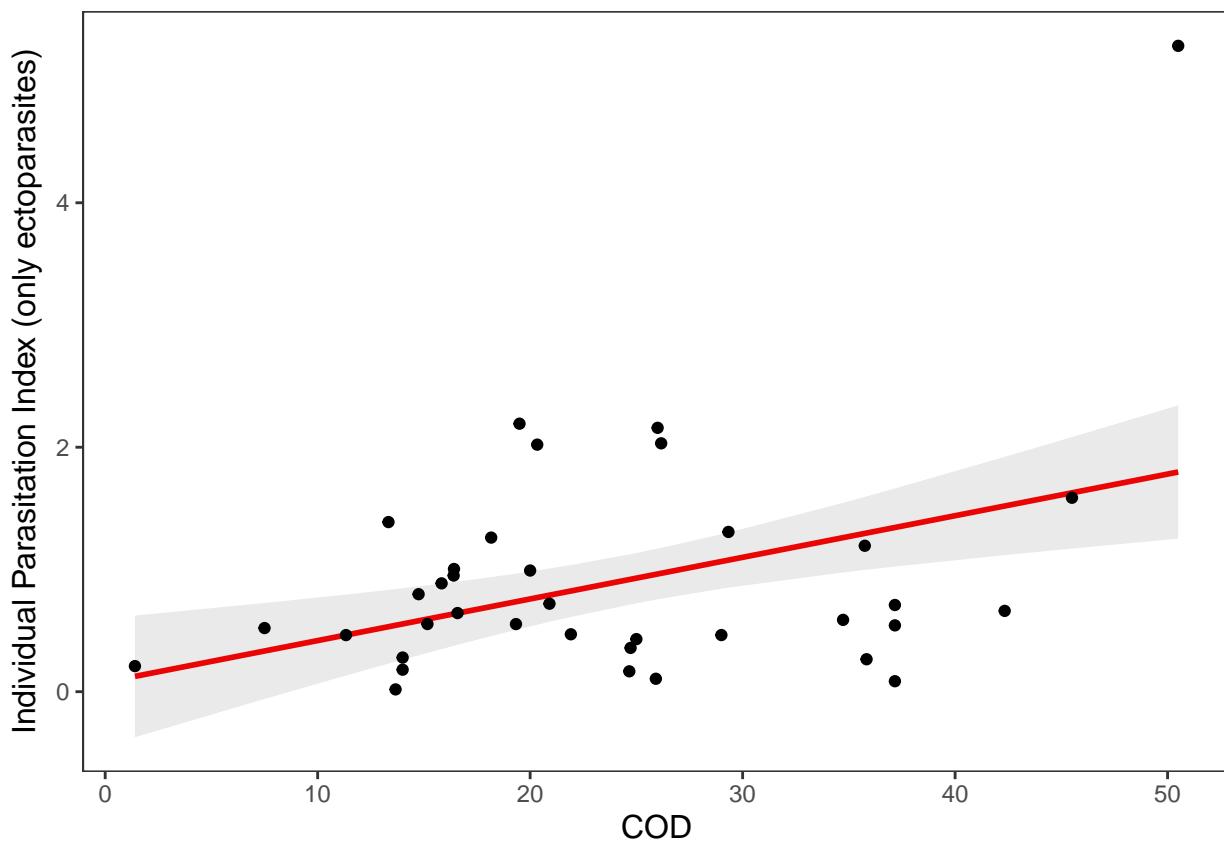
```
## NULL
```

```
confint <- confint(coef.model, parm = 2:11)
pip <- summary(bas.model)
PIP[c(1:12),13] <- pip[2:13,1]*sign(coef.model$postmean[2:13])
```

Prediction plot for marginal effect of COD on Individual Parasitization Index (only ectoparasites)

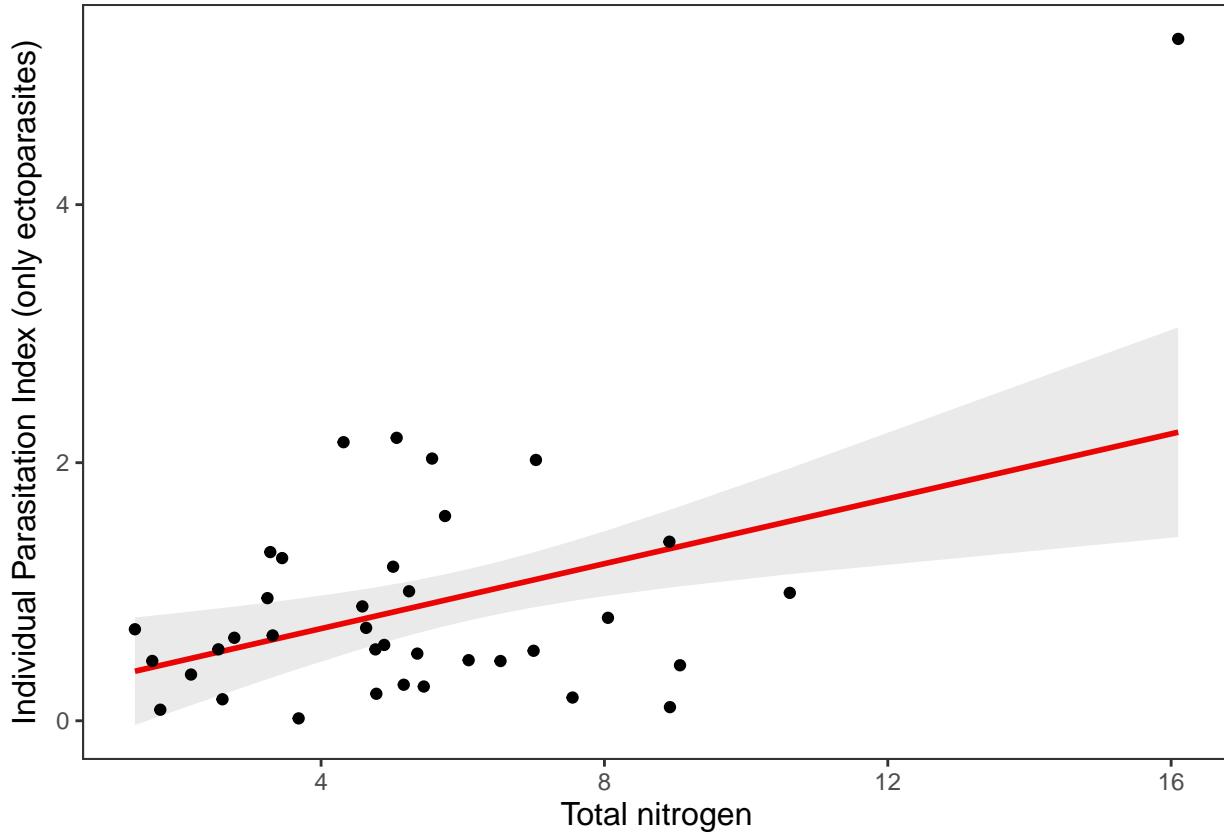
```
newdata1 <- newdata; newdata1[, "COD_av"] <- environment2$COD_av
BMA <- predict(bas.model, newdata = newdata1, estimator = "BMA", se.fit=TRUE)
ggplot(environment2, aes(COD_av, BMA$fit)) +
  theme_bw() +
  geom_line(color="red", size=1) +
  geom_ribbon(aes(ymin = (BMA$fit-BMA$se.bma.fit), ymax = (BMA$fit+BMA$se.bma.fit)), alpha = .1) +
  geom_point(data = environment2, aes(x=COD_av, y=avPI_ecto)) +
  labs(x=expression("COD"), y=expression("Individual Parasitization Index (only ectoparasites)")) +
```

```
theme(axis.title.x = element_text(size=12),
      axis.title.y = element_text(size=12)) + theme(panel.grid.major = element_blank(), panel.grid.minor = element_blank())
```



Prediction plot for marginal effect of total nitrogen on Individual Parasitation Index (only ectoparasites)

```
newdata1 <- newdata; newdata1[, "Nt_av"] <- environment2$Nt_av
BMA <- predict(bas.model, newdata = newdata1, estimator = "BMA", se.fit=TRUE)
ggplot(environment2, aes(Nt_av, BMA$fit)) +
  theme_bw() +
  geom_line(color="red", size=1) +
  geom_ribbon(aes(ymin = (BMA$fit-BMA$se.bma.fit), ymax = (BMA$fit+BMA$se.bma.fit)), alpha = .1) +
  geom_point(data = environment2, aes(x=Nt_av, y=avPI_ecto)) +
  labs(x=expression("Total nitrogen"), y=expression("Individual Parasitation Index (only ectoparasites)"))
  theme(axis.title.x = element_text(size=12),
        axis.title.y = element_text(size=12)) + theme(panel.grid.major = element_blank(), panel.grid.minor = element_blank())
```

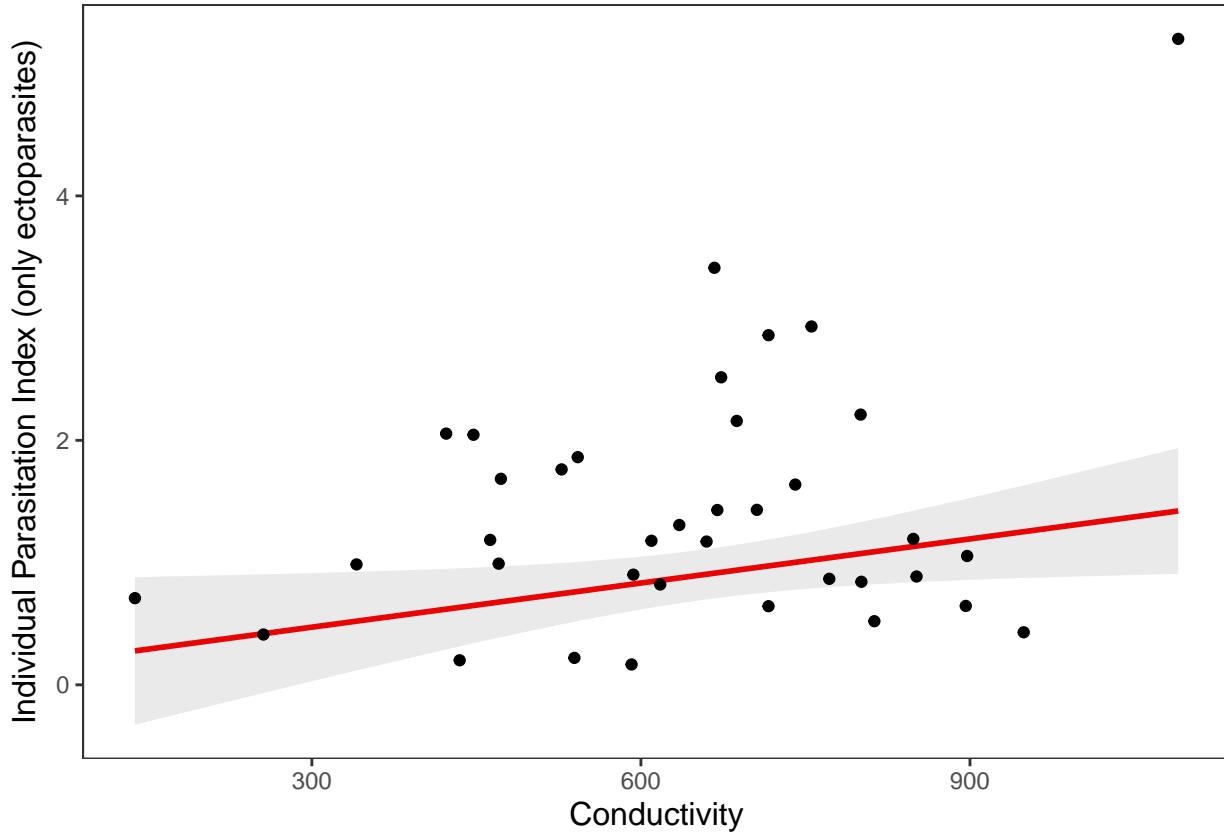


Prediction plot for marginal effect of conductivity on Individual Parasitization Index (only ectoparasites)

```

newdata1 <- newdata; newdata1[, "Con_av"] <- environment2$Con_av
BMA <- predict(bas.model, newdata = newdata1, estimator = "BMA", se.fit=TRUE)
ggplot(environment2, aes(Con_av, BMA$fit)) +
  theme_bw() +
  geom_line(color="red", size=1) +
  geom_ribbon(aes(ymin = (BMA$fit-BMA$se.bma.fit), ymax = (BMA$fit+BMA$se.bma.fit)), alpha = .1) +
  geom_point(data = environment2, aes(x=Con_av, y=avPI)) +
  labs(x=expression("Conductivity"), y=expression("Individual Parasitization Index (only ectoparasites)"))
  theme(axis.title.x = element_text(size=12),
        axis.title.y = element_text(size=12)) +  theme(panel.grid.major = element_blank(), panel.grid.minor = element_blank())

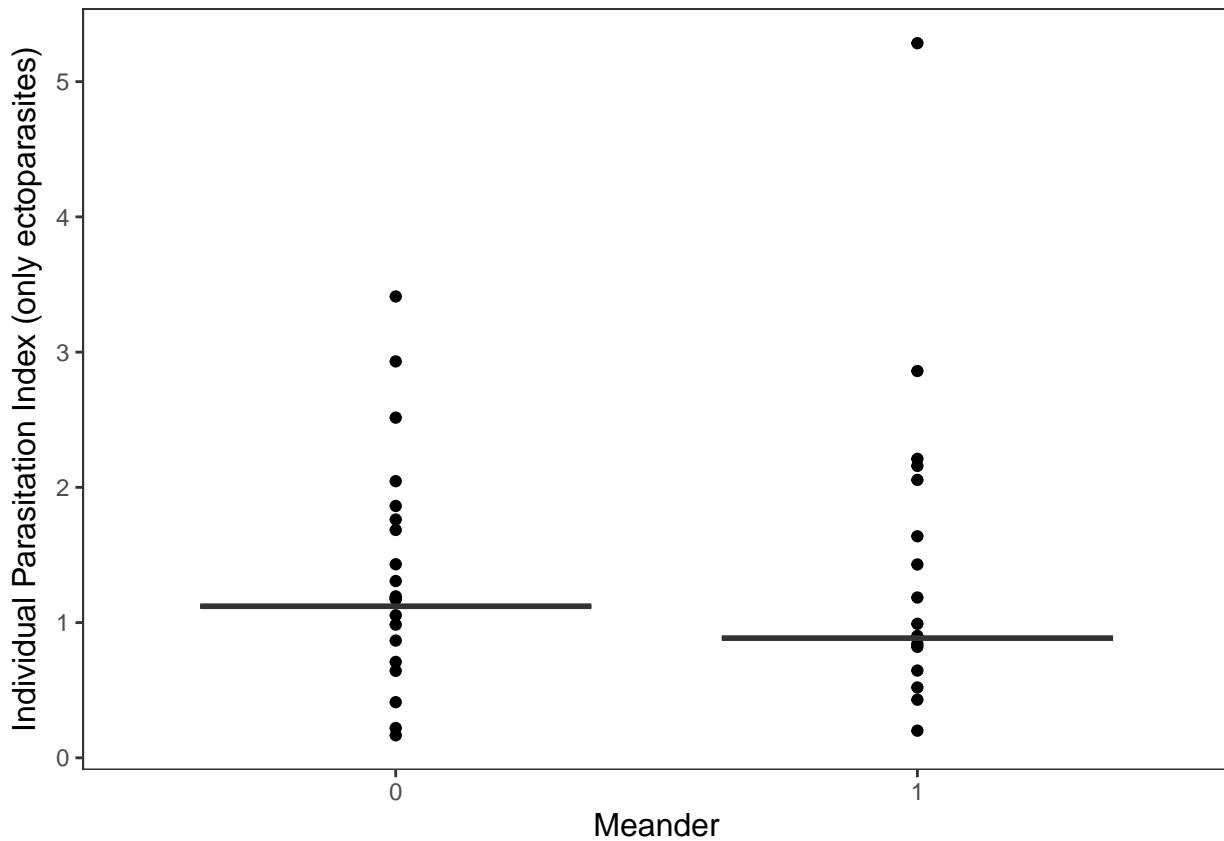
```



Prediction plot for marginal effect of meanders on Individual Parasitization Index (only ectoparasites)

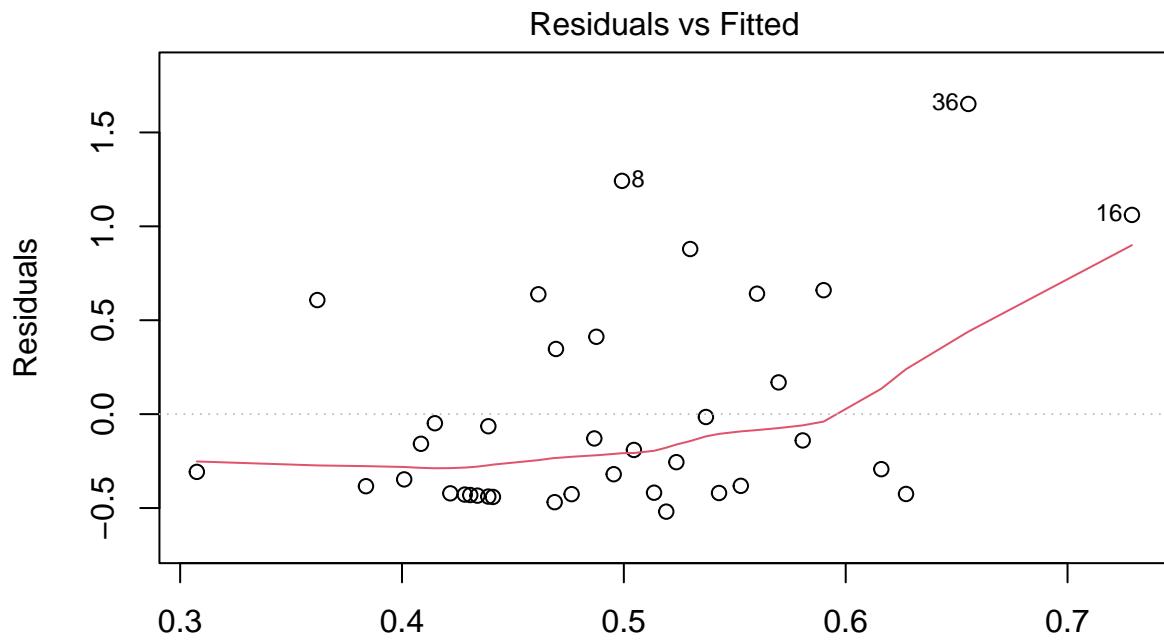
```

newdata1 <- newdata; newdata1[, "meander"] <- environment2$meander
BMA <- predict(bas.model, newdata = newdata1, estimator = "BMA", se.fit=TRUE)
ggplot(environment2, aes(meander, BMA$fit)) +
  theme_bw() +
  #geom_line(color="red", size=1) +
  #geom_ribbon(aes(ymin = (BMA$fit-BMA$se.bma.fit), ymax = (BMA$fit+BMA$se.bma.fit)), alpha = .1) +
  geom_point(data = environment2, aes(x=meander, y=avPI)) +
  geom_boxplot(aes(lower = (BMA$fit-BMA$se.bma.fit), middle = BMA$fit, upper = (BMA$fit+BMA$se.bma.fit)))
  labs(x=expression("Meander"), y=expression("Individual Parasitization Index (only ectoparasites)")) +
  theme(axis.title.x = element_text(size=12),
        axis.title.y = element_text(size=12)) +  theme(panel.grid.major = element_blank(), panel.grid.minor = element_blank())
  
```

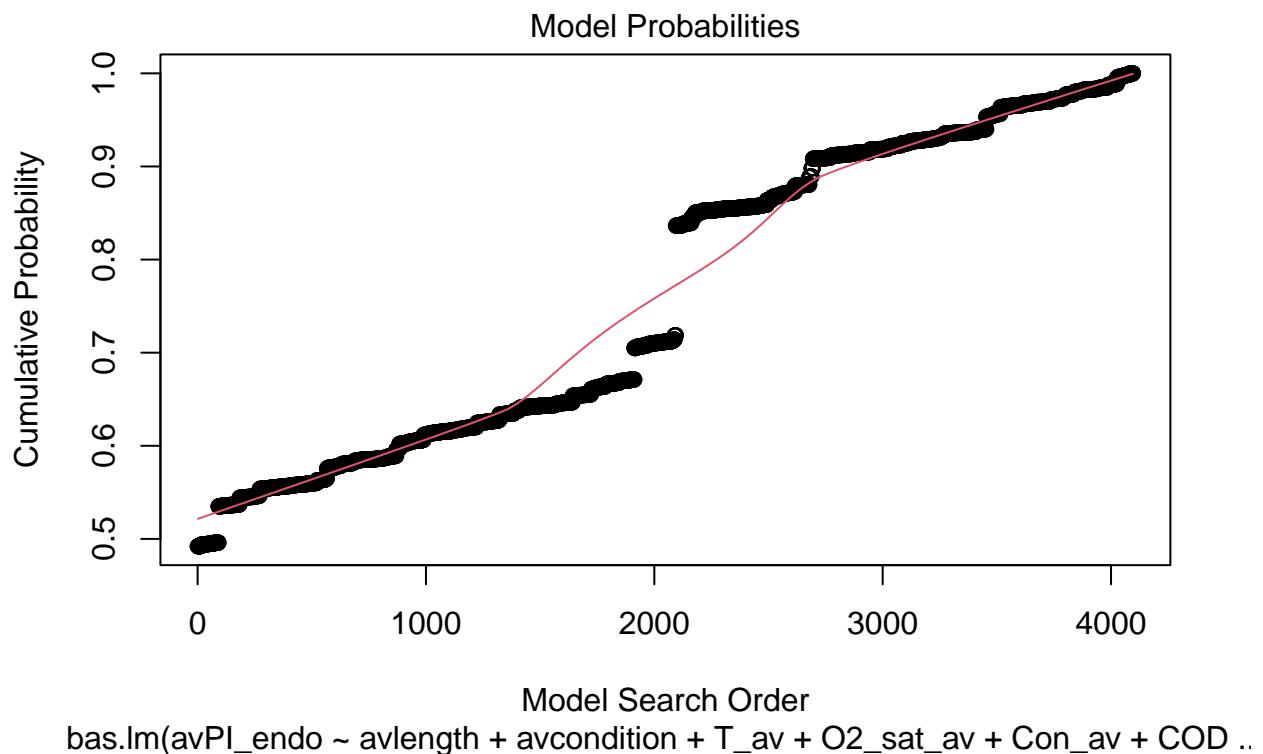


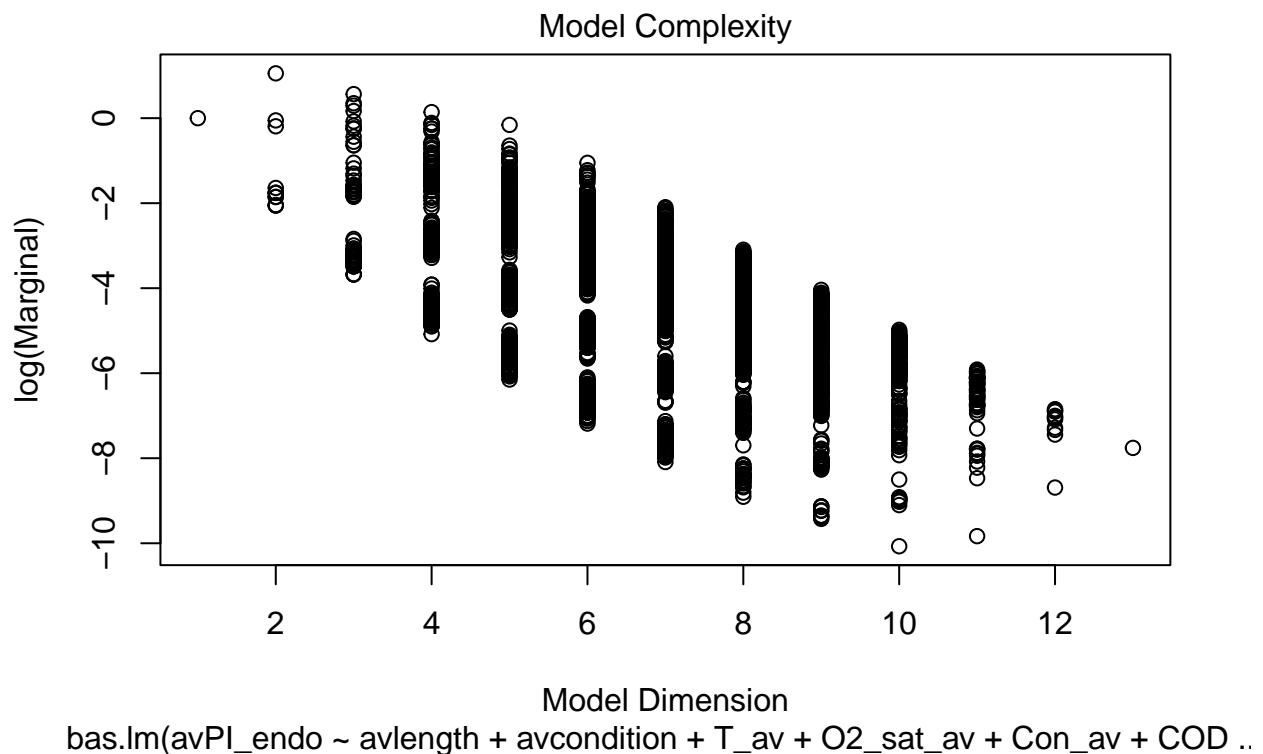
Variation in Individual Parasitization Index (only endoparasites)

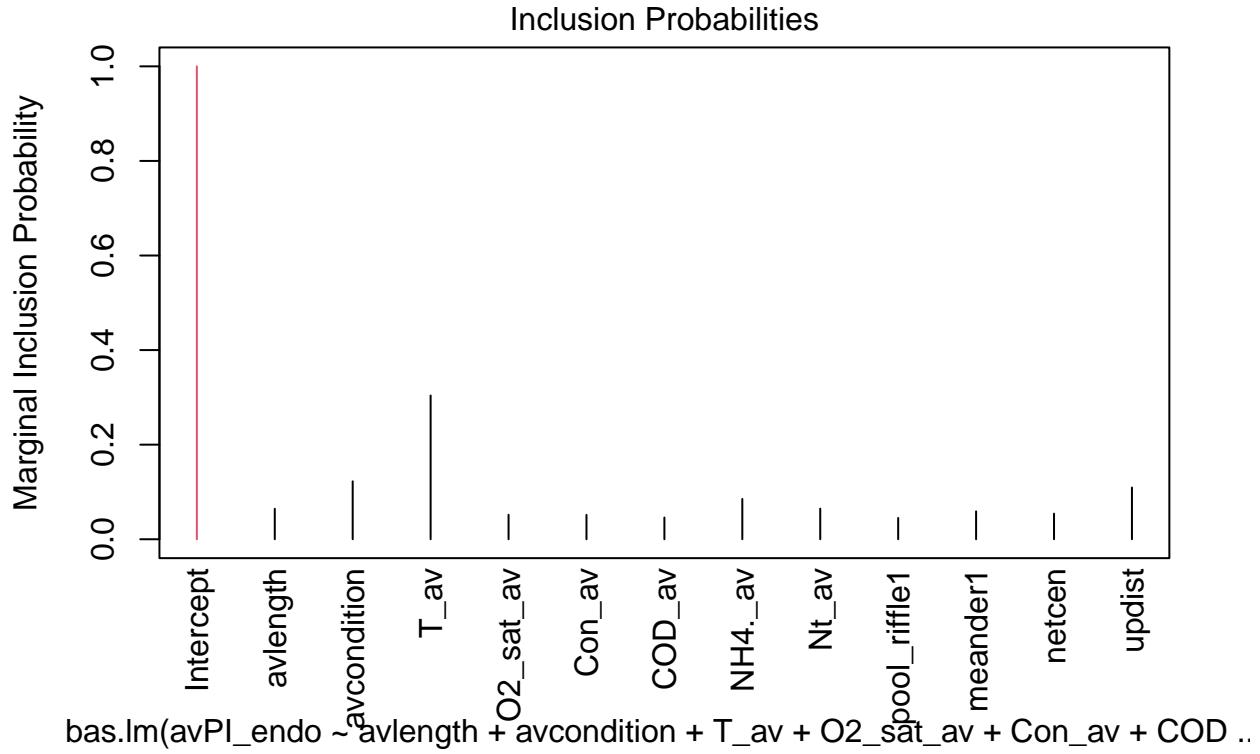
```
bas.model <- bas.lm(avPI_endo ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
+ NH4_av + Nt_av + pool_riffle + meander + netcen +
updist, data=environment2, prior="JZS")
yhat = fitted(bas.model, estimator = "BMA") #these are the fitted values under BMA
r = bas.model$Y - yhat #these are the model residuals
plot(bas.model)
```



Predictions under BMA
bas.lm(avPI_endo ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD ..)



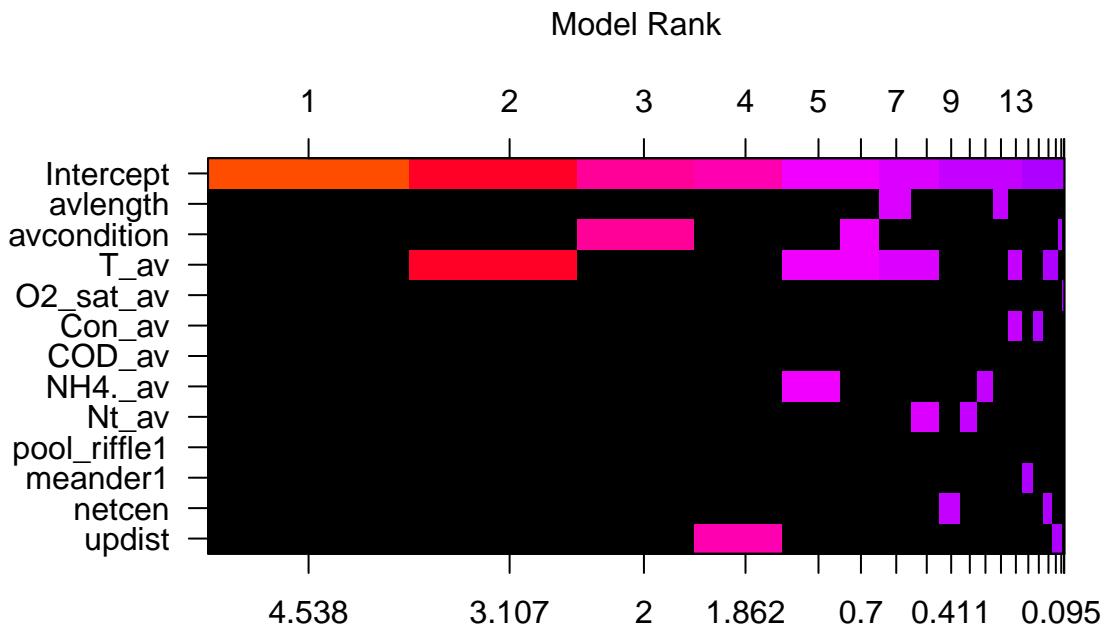




```
summary(bas.model)
```

	P(B != 0 Y)	model 1	model 2	model 3	model 4	model 5
## Intercept	1.00000000	1.0000000	1.0000000	1.00000000	1.0000000	1.0000000
## avlength	0.06442140	0.0000000	0.0000000	0.00000000	0.0000000	0.0000000
## avcondition	0.12246410	0.0000000	0.0000000	1.00000000	0.0000000	0.0000000
## T_av	0.30397004	0.0000000	1.0000000	0.00000000	0.0000000	1.0000000
## O2_sat_av	0.05178919	0.0000000	0.0000000	0.00000000	0.0000000	0.0000000
## Con_av	0.05158494	0.0000000	0.0000000	0.00000000	0.0000000	0.0000000
## COD_av	0.04593088	0.0000000	0.0000000	0.00000000	0.0000000	0.0000000
## NH4_av	0.08528364	0.0000000	0.0000000	0.00000000	0.0000000	1.0000000
## Nt_av	0.06477759	0.0000000	0.0000000	0.00000000	0.0000000	0.0000000
## pool_riffle1	0.04504579	0.0000000	0.0000000	0.00000000	0.0000000	0.0000000
## meander1	0.05899866	0.0000000	0.0000000	0.00000000	0.0000000	0.0000000
## netcen	0.05414430	0.0000000	0.0000000	0.00000000	0.0000000	0.0000000
## updist	0.10936917	0.0000000	0.0000000	0.00000000	1.0000000	0.0000000
## BF	NA	0.3484238	1.0000000	0.33059983	0.2877395	0.6134470
## PostProbs	NA	0.4921000	0.1177000	0.03890000	0.0339000	0.0131000
## R2	NA	0.0000000	0.1661000	0.11040000	0.1032000	0.2244000
## dim	NA	1.0000000	2.0000000	2.00000000	2.0000000	3.0000000
## logmarg	NA	0.0000000	1.054336	-0.05251095	-0.1913639	0.5656742

```
image(bas.model, rotate=F)
```



Log Posterior Odds

```
coef.model <- coef(bas.model)
abs(coef.model$postmean)-2*coef.model$postsd > 0
```

```
## [1] TRUE FALSE FALSE
## [13] FALSE
```

```
confint(coef.model)
```

```
##              2.5%      97.5%       beta
## Intercept  2.973748e-01 6.855702e-01 4.947994e-01
## avlength   0.000000e+00 1.998346e-02 1.398963e-03
## avcondition 0.000000e+00 2.560084e+00 2.446911e-01
## T_av       0.000000e+00 2.138662e-01 4.520999e-02
## O2_sat_av -2.327383e-04 7.290041e-05 -2.446396e-04
## Con_av     0.000000e+00 0.000000e+00 -1.385311e-05
## COD_av     0.000000e+00 0.000000e+00 -1.072193e-04
## NH4._av    -1.081617e-01 1.011586e-03 -9.322620e-03
## Nt_av      -3.100945e-02 1.180365e-03 -2.149910e-03
## pool_riffle1 0.000000e+00 0.000000e+00 2.267863e-03
## meander1   0.000000e+00 1.265444e-01 1.005422e-02
## netcen     -1.836413e-06 0.000000e+00 -3.607730e-07
## updist     -9.519964e-06 0.000000e+00 -8.091451e-07
## attr(),"Probability")
## [1] 0.95
## attr(),"class")
```

```

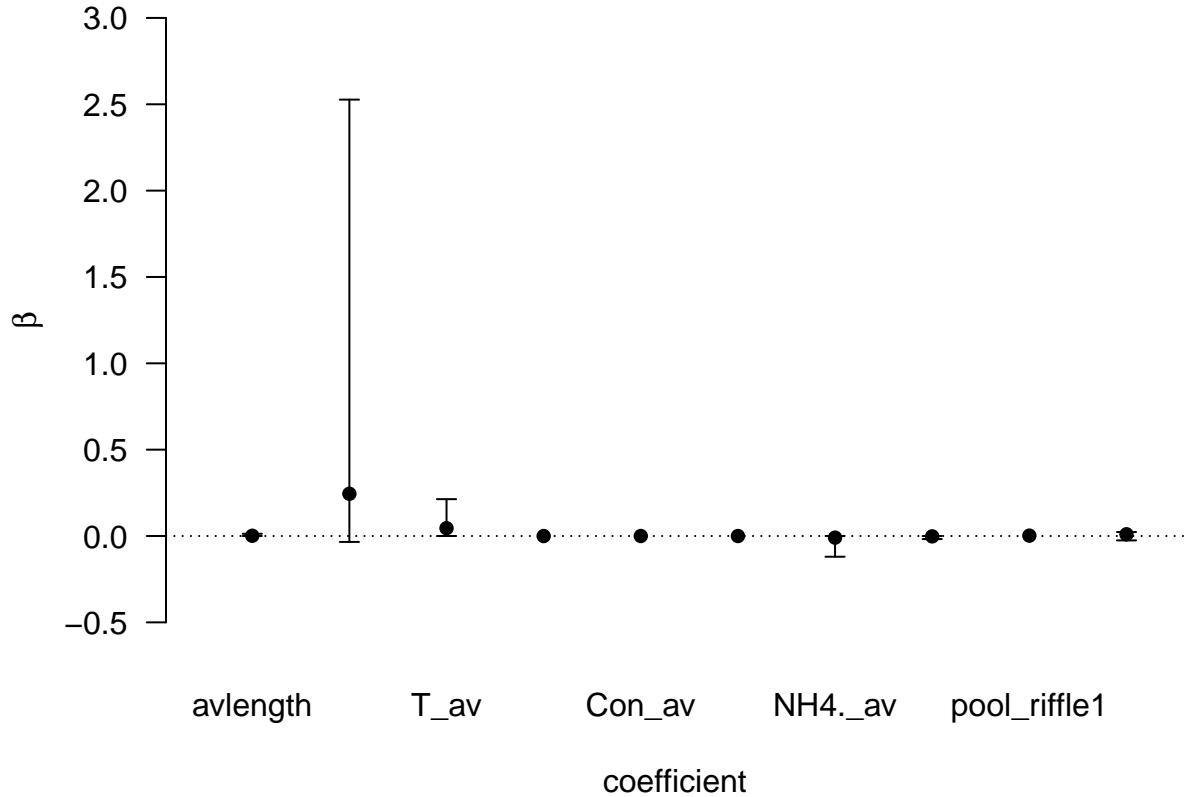
## [1] "confint.bas"

plot(confint(coef.model, parm = 2:11))

## Warning in arrows(x[not.deg], ci[not.deg, 1], x[not.deg], ci[not.deg, 2], :
## zero-length arrow is of indeterminate angle and so skipped

## Warning in arrows(x[not.deg], ci[not.deg, 1], x[not.deg], ci[not.deg, 2], :
## zero-length arrow is of indeterminate angle and so skipped

```



```

## NULL

confint <- confint(coef.model, parm = 2:11)
pip <- summary(bas.model)
PIP[c(1:12),14] <- pip[2:13,1]*sign(coef.model$postmean[2:13])

```

7. BORAL analysis

Model-based analysis of multivariate abundance data using Bayesian Markov chain Monte Carlo methods for parameter estimation

7.1 BORAL analysis for average abundances of parasites

```

data$Site <- as.factor(data$site)
levels(data$site) <- levels(as.factor(environment2$Site))
data_m <- merge(data, environment2, by = "Site")
data_all <- na.omit(data_m)
names(data_all)

## [1] "Site"           "site"            "fish"
## [4] "parspeciesrichness" "div_shannon"      "div_simpson"
## [7] "temp"            "pH"              "conductivity"
## [10] "nitrogen"        "phosphorus"      "oxygen"
## [13] "netcen.x"        "updist.x"        "updist2"
## [16] "updist3"         "fishspeciesrichness" "weight"
## [19] "weigh..g."       "length"          "SMI"
## [22] "Sex"             "Gyr"             "Tri"
## [25] "Glu"             "ecto_screener"   "Con"
## [28] "CysL"            "Pro"             "Aca"
## [31] "Cam"             "Ang"             "CysI"
## [34] "endo_screener"   "PI"              "PI_ecto"
## [37] "PI_endo"         "T_av"            "O2_sat_av"
## [40] "Con_av"          "COD_av"          "NH4._av"
## [43] "Nt_av"           "SM_av"           "pool_riffle"
## [46] "meander"         "updist.y"        "netcen.y"

avcondition <- aggregate(data$SMI, by = list(data[,1]), function(x){mean(x, na.rm =T)}) [,2]
avlength <- aggregate(data$length, by = list(data[,1]), function(x){mean(x, na.rm =T)}) [,2]

y <- round(cbind(avab$Gyr, avab$Tri, avab$Glu, avab$Con, avab$Ang))
X <- cbind(avcondition,
           avlength,
           environment2$T_av,
           environment2$O2_sat_av,
           environment2$Con_av,
           environment2$COD_av,
           environment2$NH4._av,
           environment2$Nt_av,
           environment2$netcen,
           environment2$updist,
           as.numeric(environment2$pool_riffle),
           as.numeric(environment2$meander))

colnames(X) <- c("avcondition", "avlength", "T", "O2", "Con", "COD", "NH4", "Nt", "netcen", "updist", "meander")

example_mcmc_control <- list(n.burnin = 1000, n.iteration = 10000, n.thin = 1)
testpath <- file.path(tempdir(), "jagsboralmodel.txt")
paramod <- boral(y, X = X,
                  family = "negative.binomial",
                  mcmc.control = example_mcmc_control,
                  model.name = testpath,
                  lv.control = list(num.lv = 2, type = "independent"),
                  save.model = TRUE)

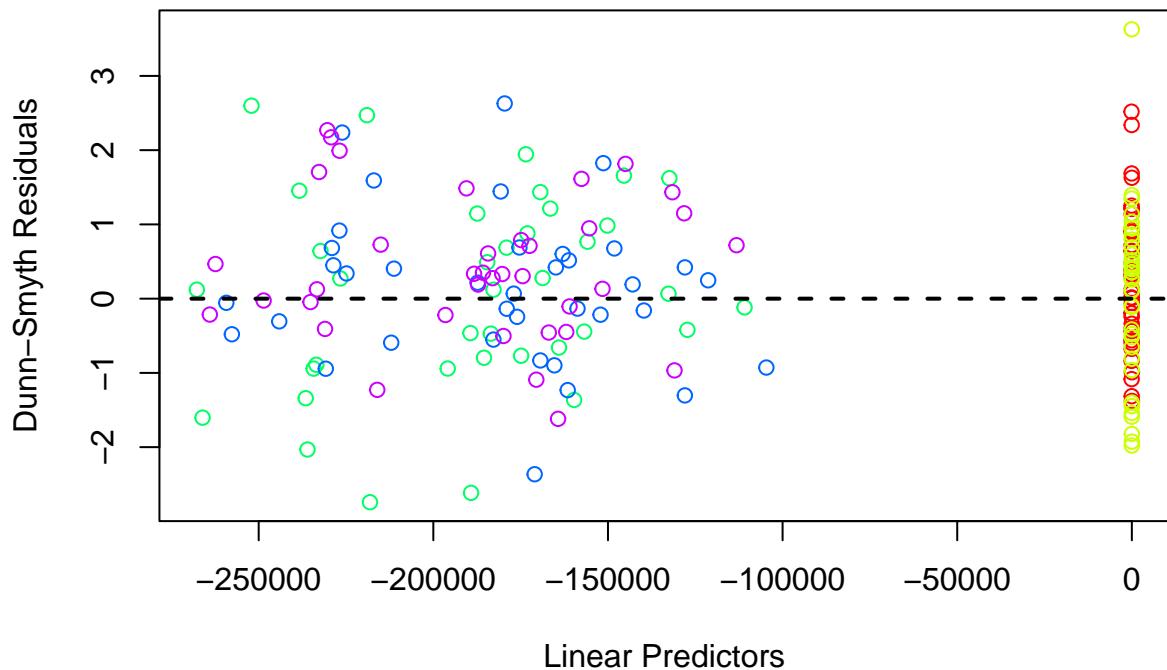
## module glm loaded

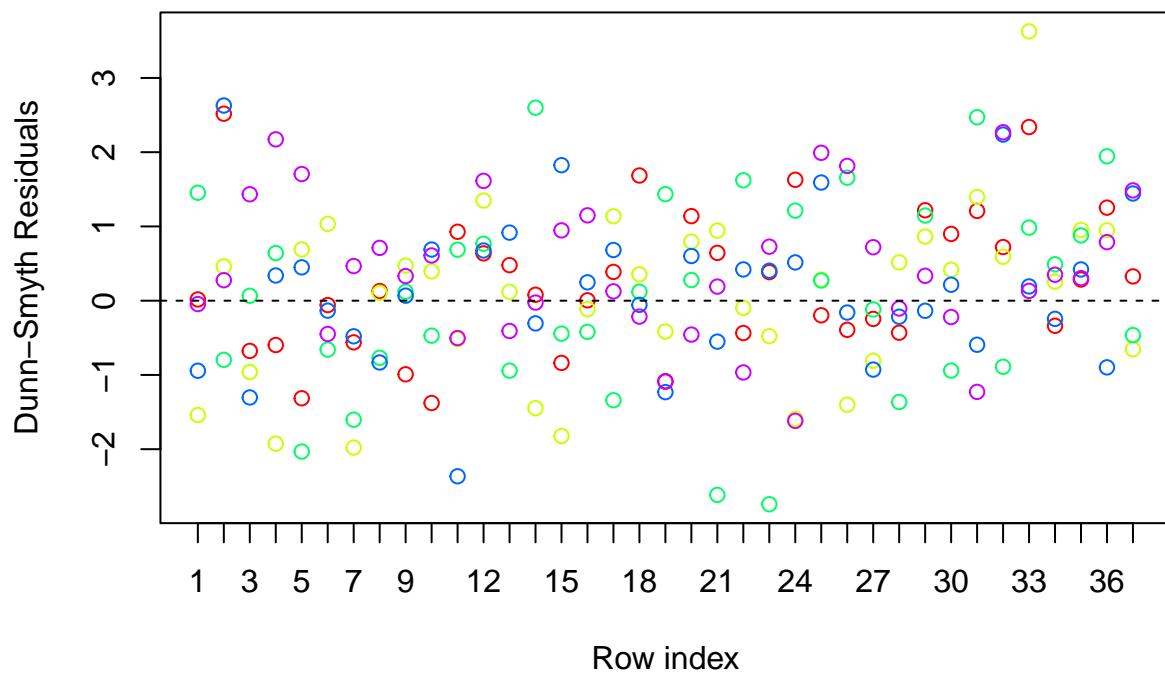
```

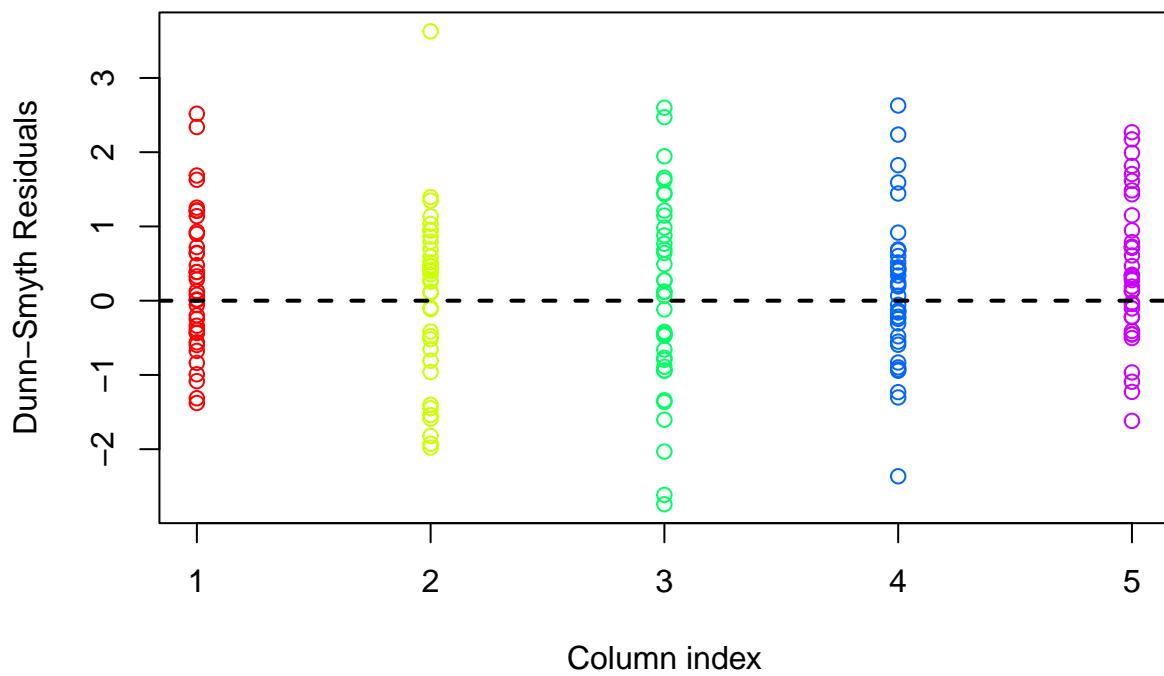
```
## Compiling model graph
##   Resolving undeclared variables
##   Allocating nodes
## Graph information:
##   Observed stochastic nodes: 185
##   Unobserved stochastic nodes: 338
##   Total graph size: 2173
##
## Initializing model
```

```
plot(paramod)
```

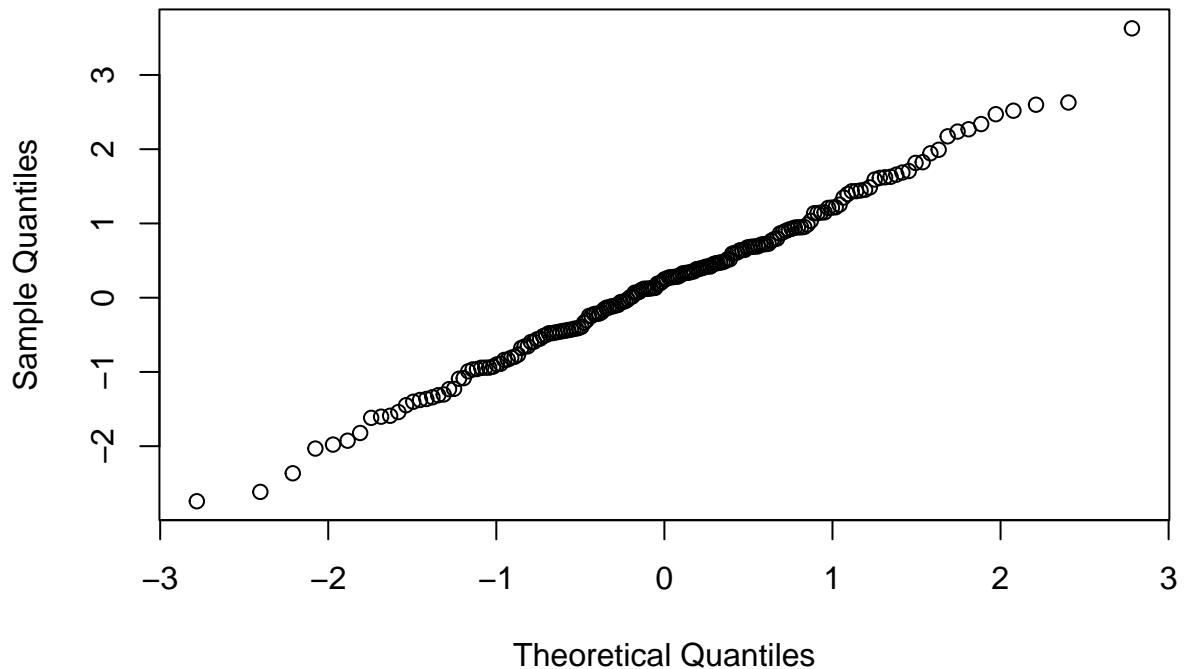
```
## NULL
```





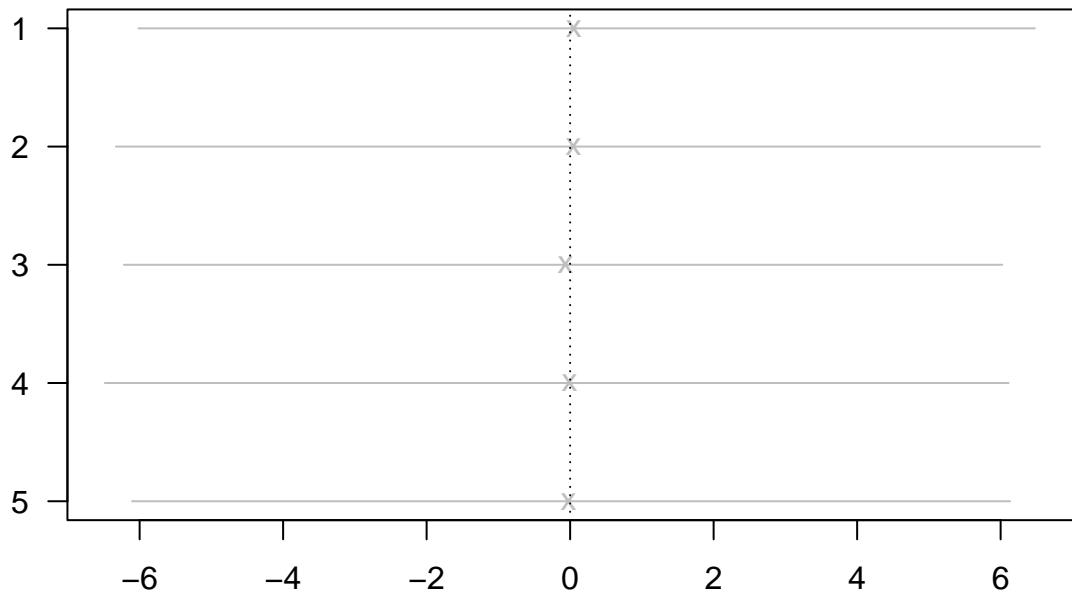


Quantile–Quantile Plot



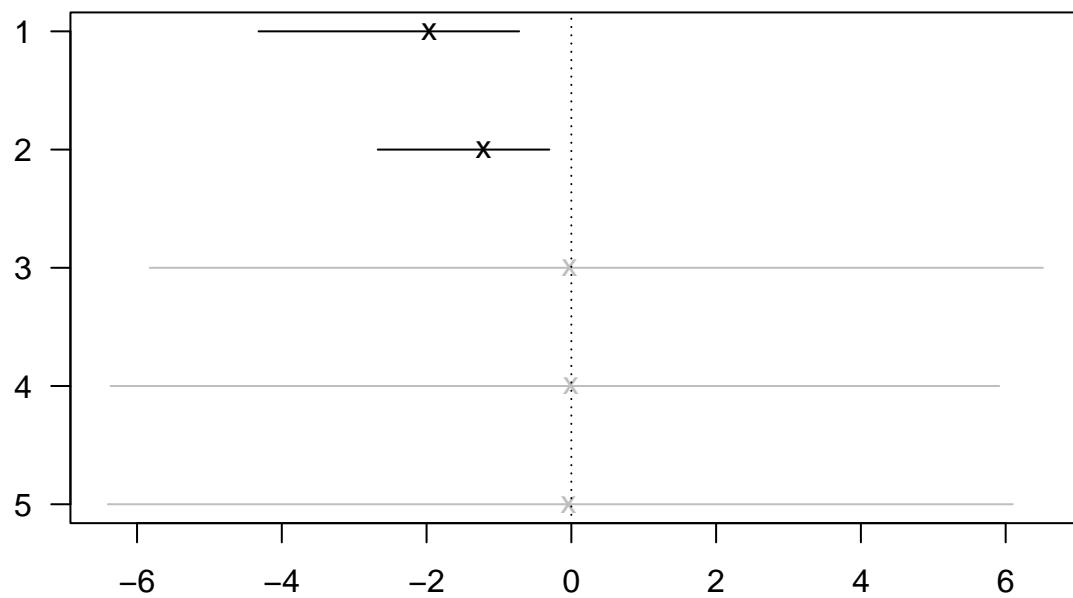
```
coefsplot(covname = "avcondition", object = paramod) #Condition
```

avcondition



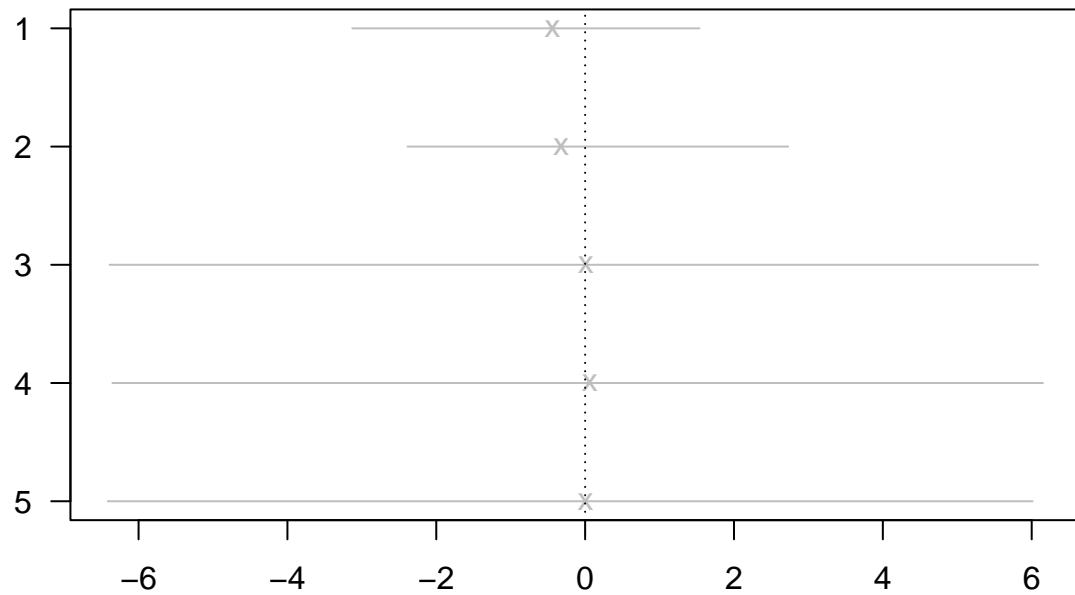
```
coefsplot(covname = "avlength", object = paramod) #Length
```

avlength



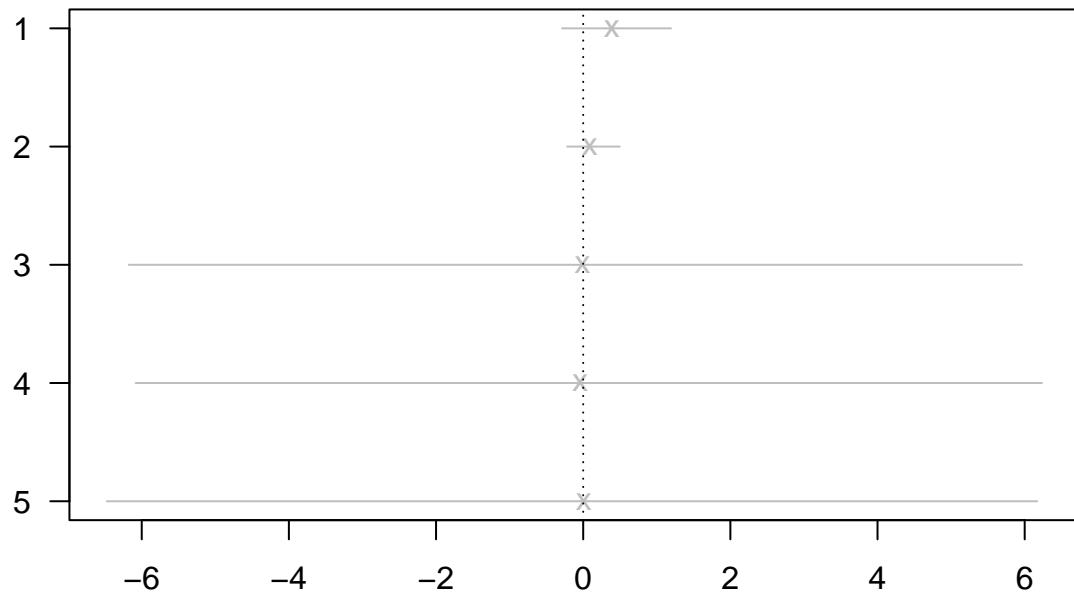
```
coefsplot(covname = "T", object = paramod) #Temperature
```

T



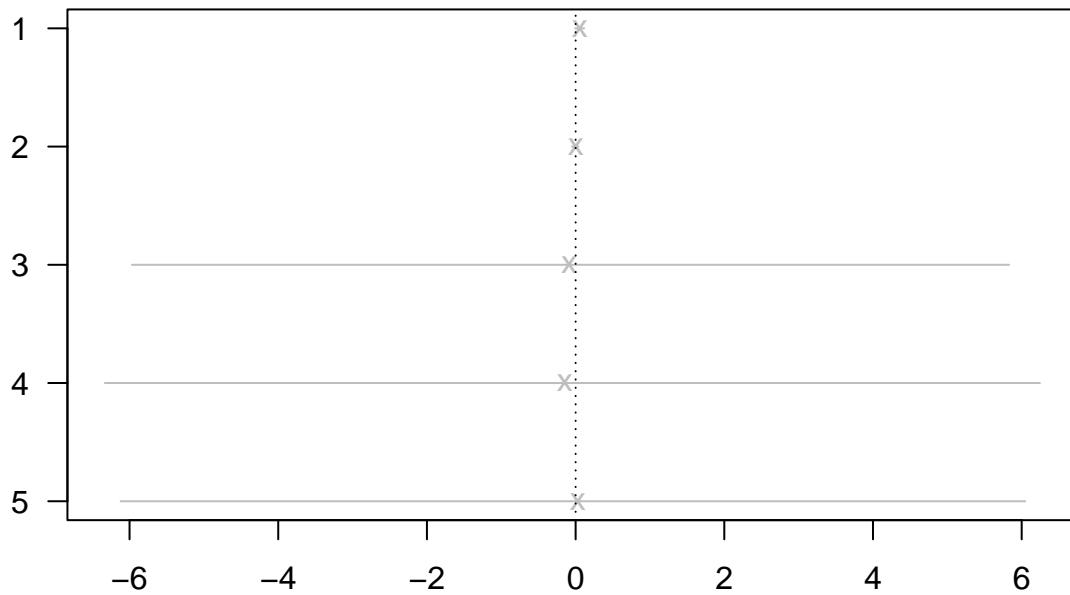
```
coefsplot(covname = "02", object = paramod) #Oxygen
```

O2



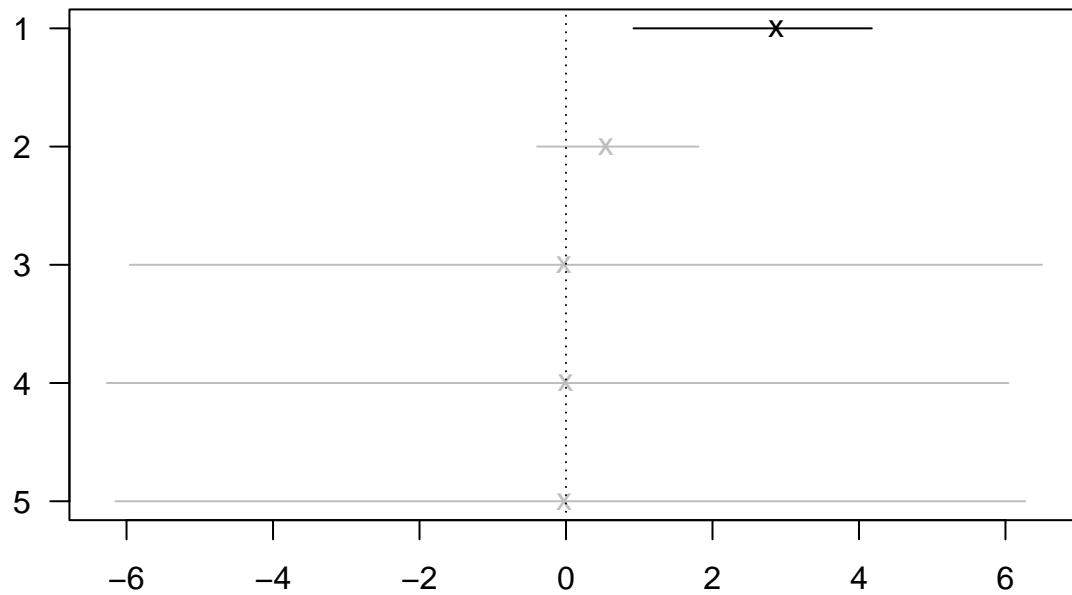
```
coefsplot(covname = "Con", object = paramod) #Conductivity
```

Con



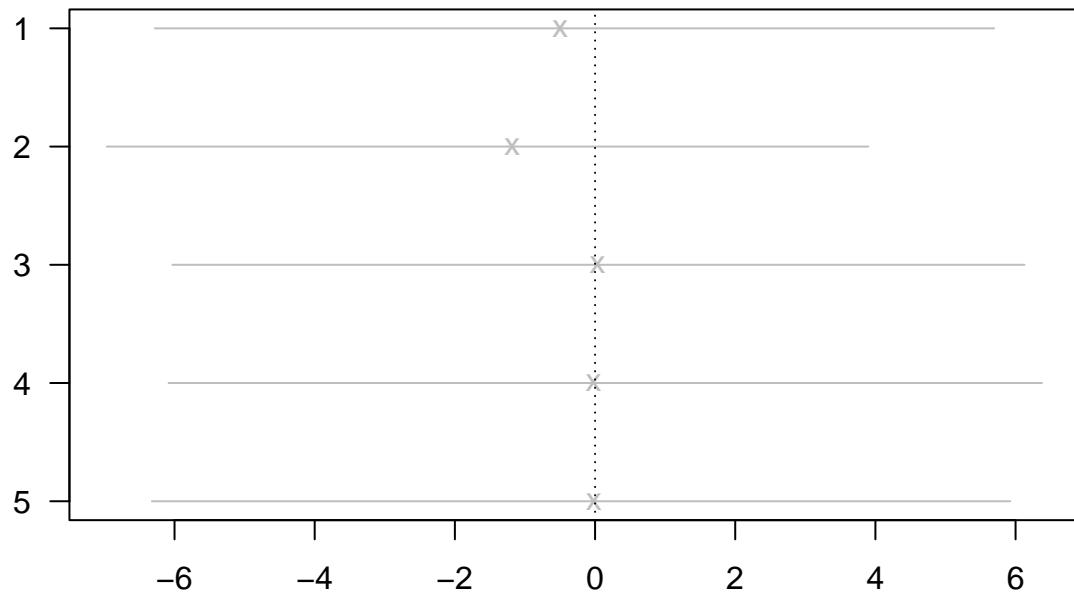
```
coefsplot(covname = "COD", object = paramod) #COD
```

COD



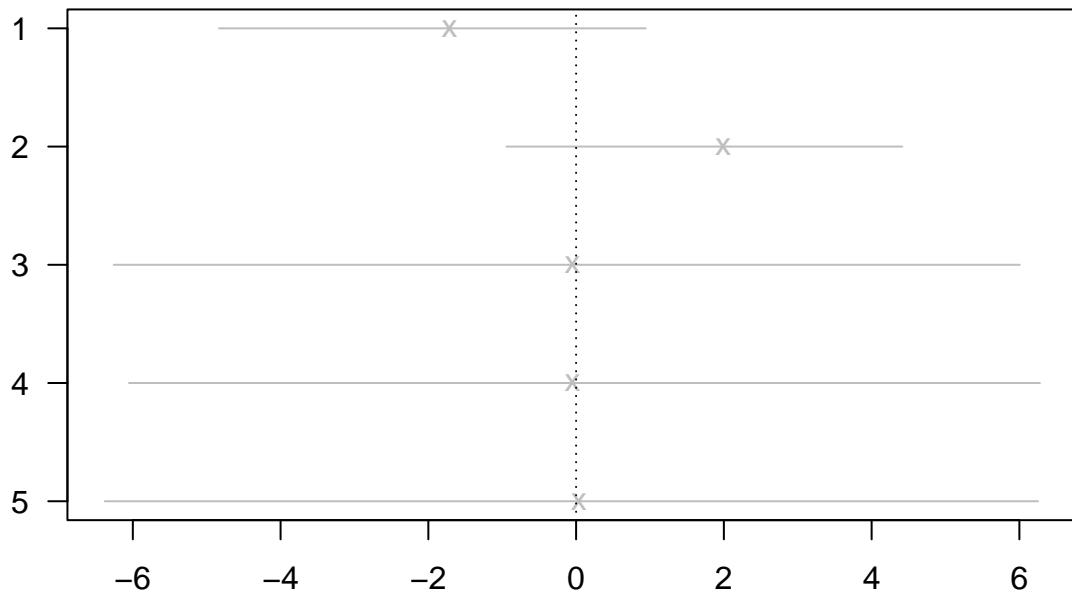
```
coefsplot(covname = "NH4", object = paramod) #NH4
```

NH4



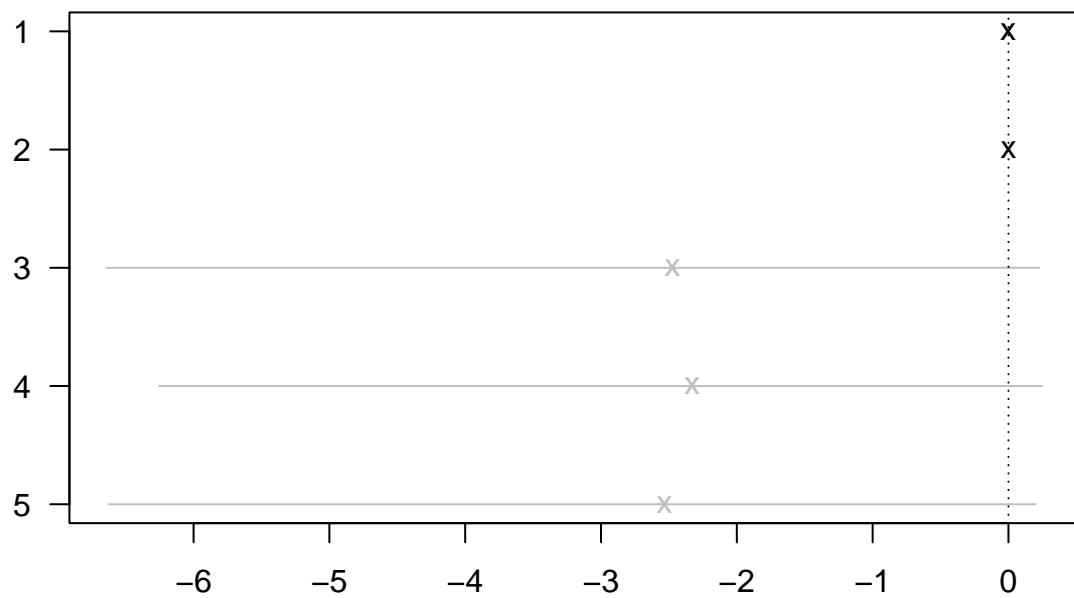
```
coefsplot(covname = "Nt", object = paramod) #Nt
```

Nt



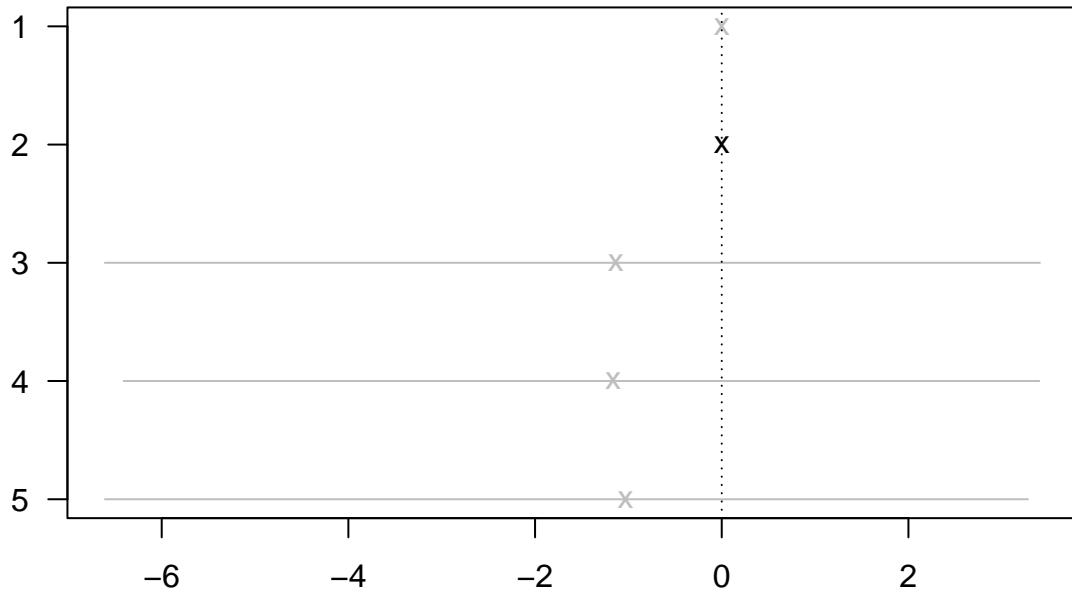
```
coefsplot(covname = "netcen", object = paramod) #netcen
```

netcen



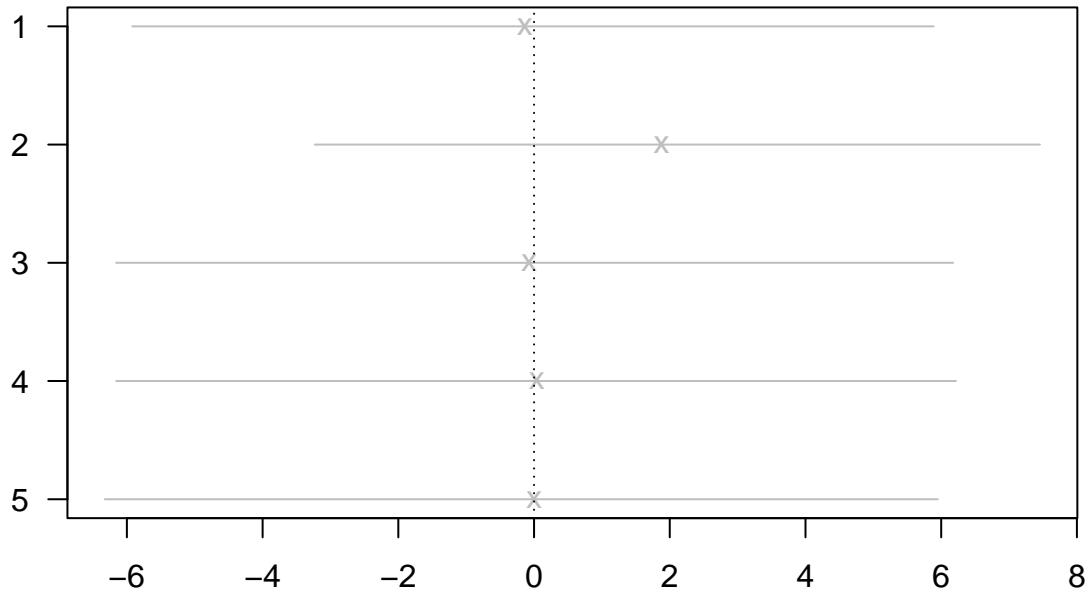
```
coefsplot(covname = "updist", object = paramod) #updist
```

updist



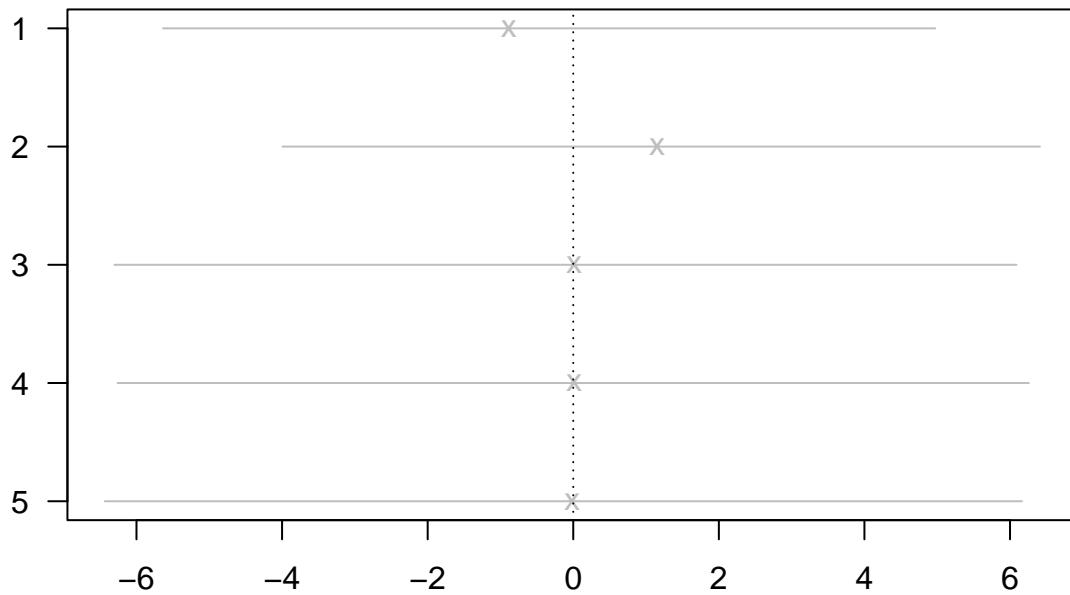
```
coefsplot(covname = "pool_riffle", object = paramod) #poolriffle
```

pool_riffle



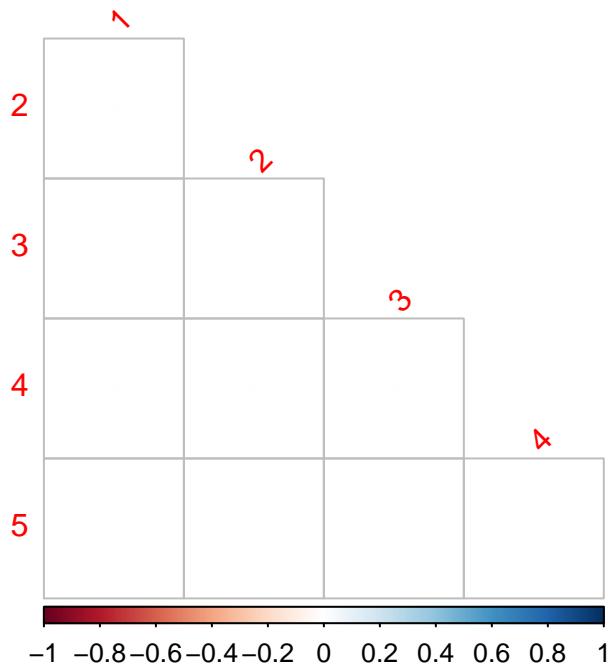
```
coefsplot(covname = "meander", object = paramod) #meander
```

meander



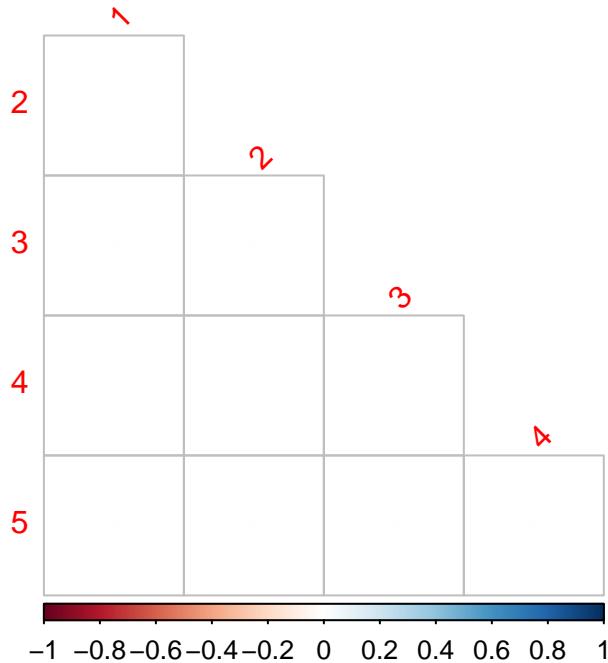
```
envcors <- get.enviro.cor(paramod)
rescors <- get.residual.cor(paramod)
corrplot(envcors$sig.cor, type = "lower", diag = FALSE, title = "Correlations due to covariates", mar =
```

Correlations due to covariates



```
corrplot(rescors$sig.cor, type = "lower", diag = FALSE, title = "Residual correlations", mar = c(3,0.5,1,1))
```

Residual correlations



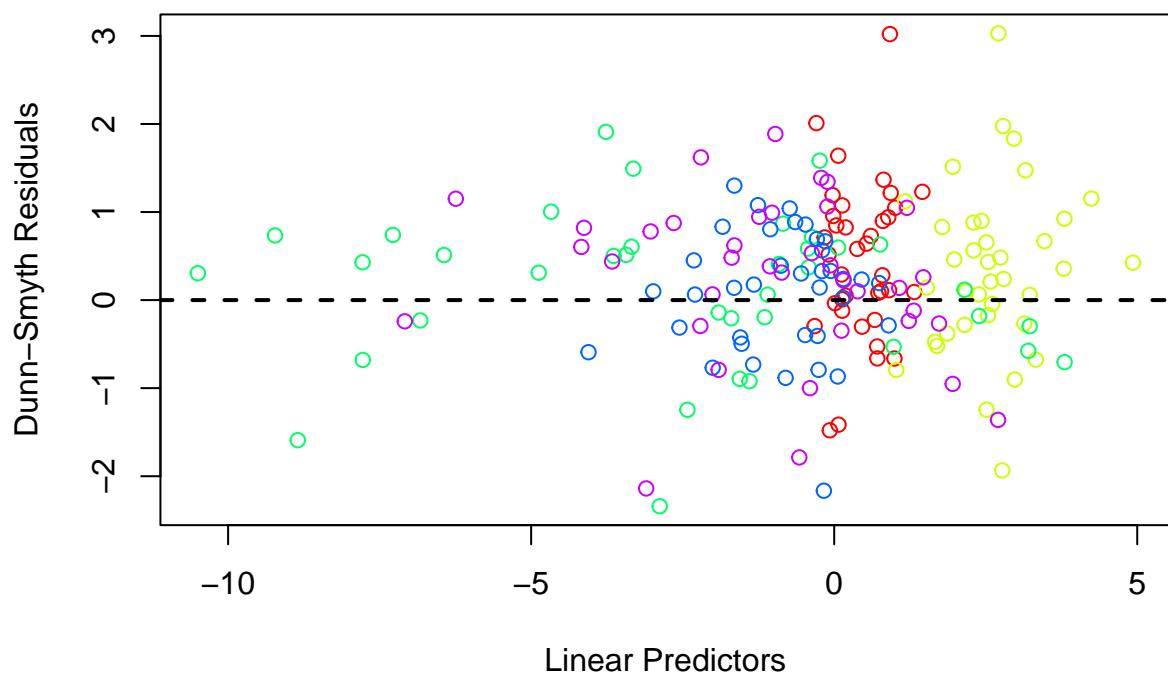
7.1 BORAL analysis for median infection intensities of parasites

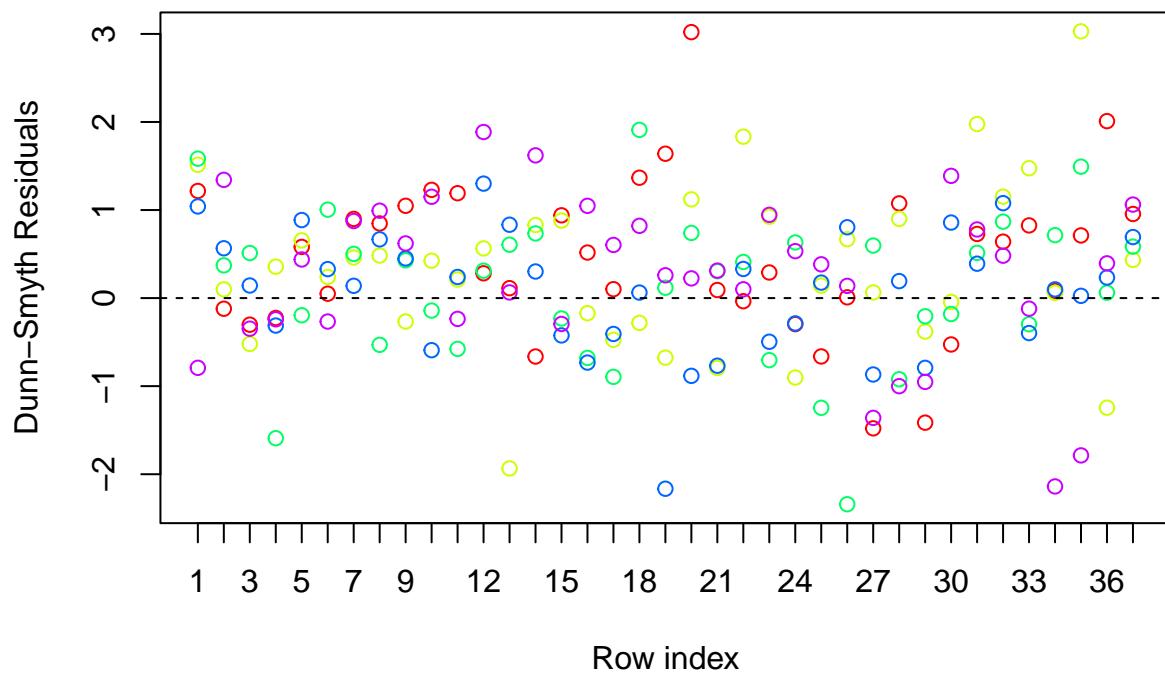
```
y <- round(cbind(medin$Gyr, medin$Tri, medin$Glu, medin$Con, medin$Ang))
paramod <- boral(y, X = X,
  family = "negative.binomial",
  mcmc.control = example_mcmc_control,
  model.name = testpath,
  lv.control = list(num.lv = 2, type = "independent"),
  save.model = TRUE)
```

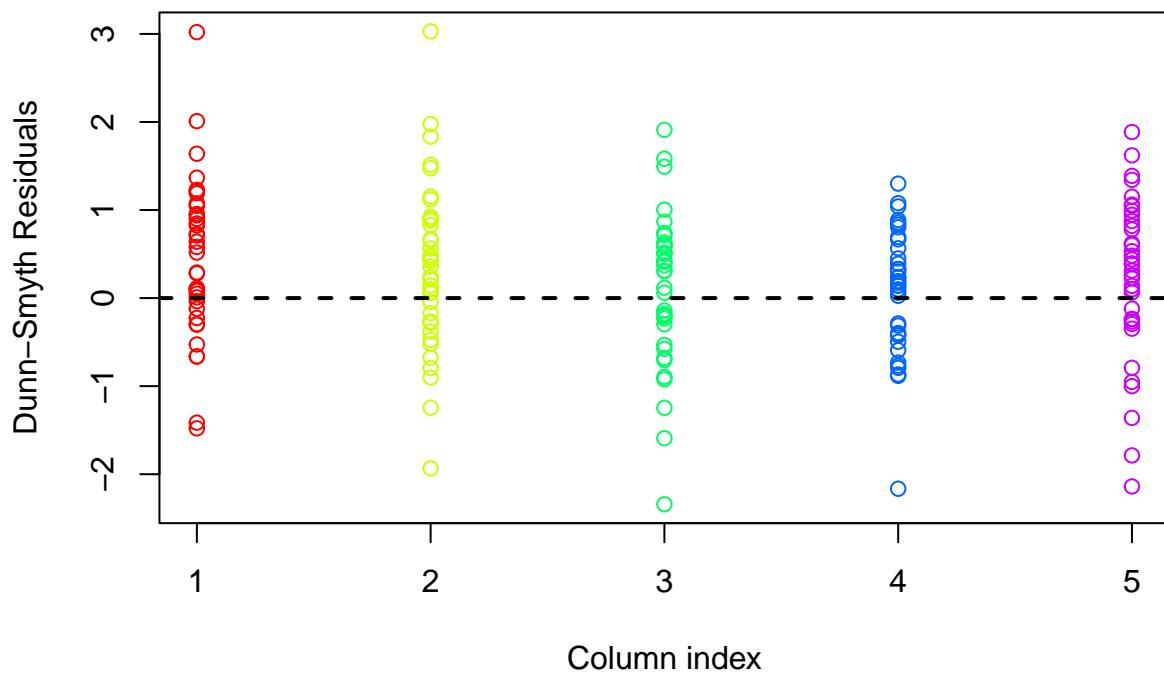
```
## Compiling model graph
##   Resolving undeclared variables
##   Allocating nodes
## Graph information:
##   Observed stochastic nodes: 185
##   Unobserved stochastic nodes: 338
##   Total graph size: 2173
##
## Initializing model
```

```
plot(paramod)
```

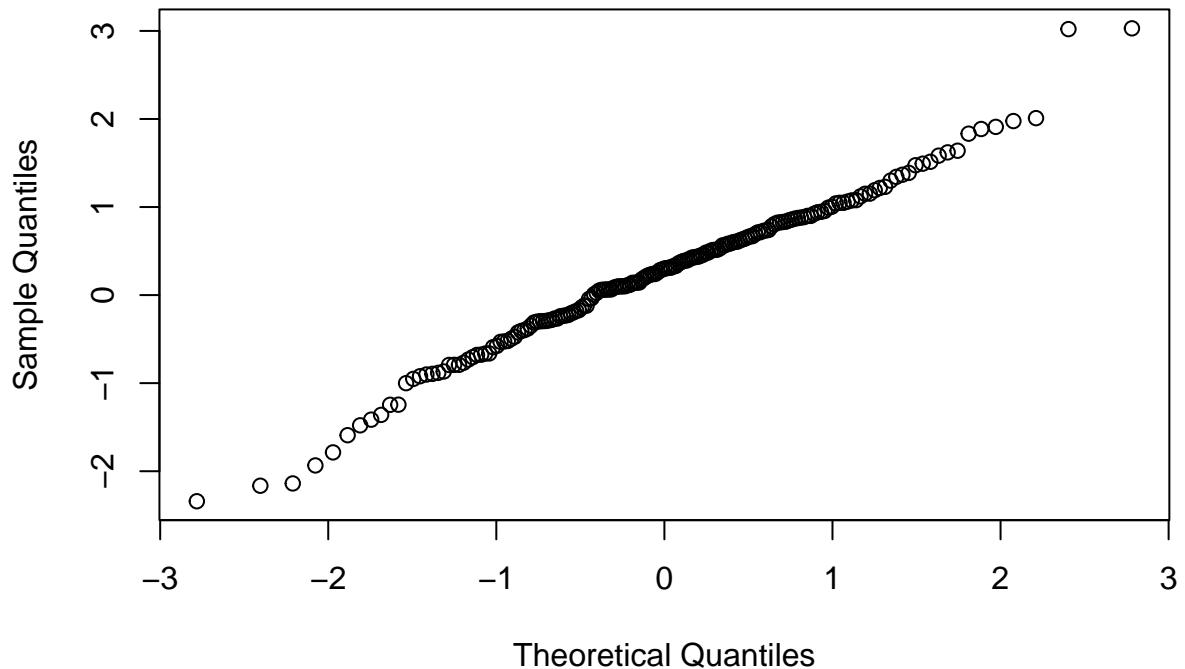
```
## NULL
```





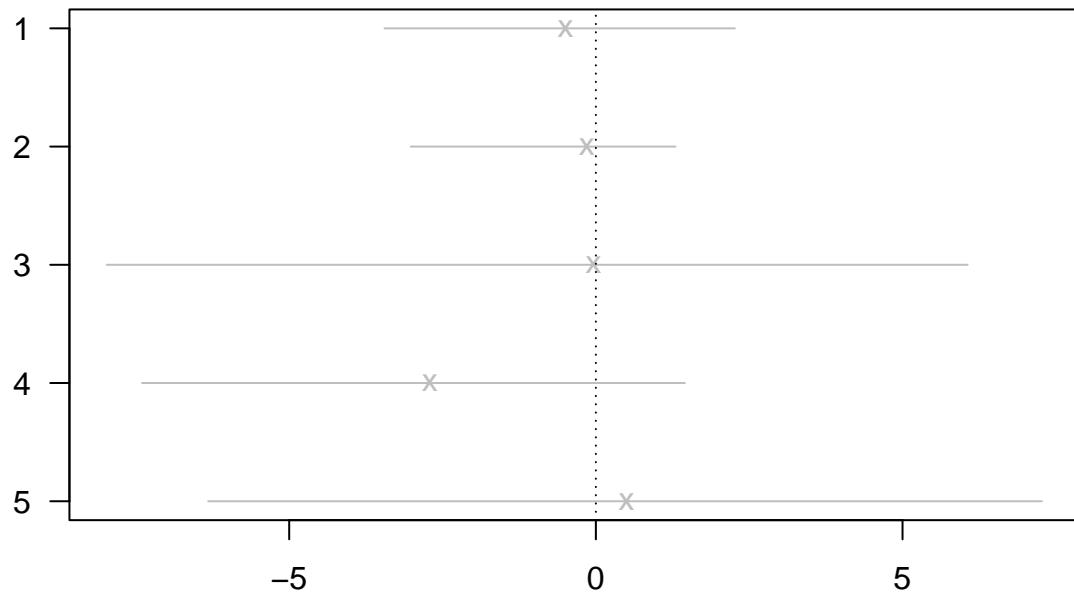


Quantile–Quantile Plot



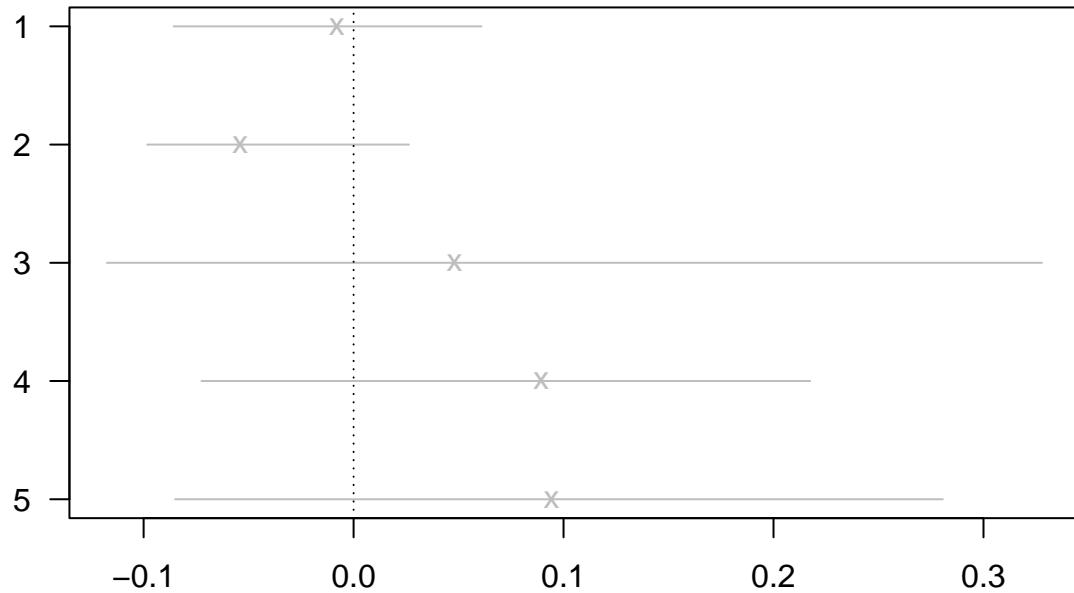
```
coefsplot(covname = "avcondition", object = paramod) #Condition
```

avcondition



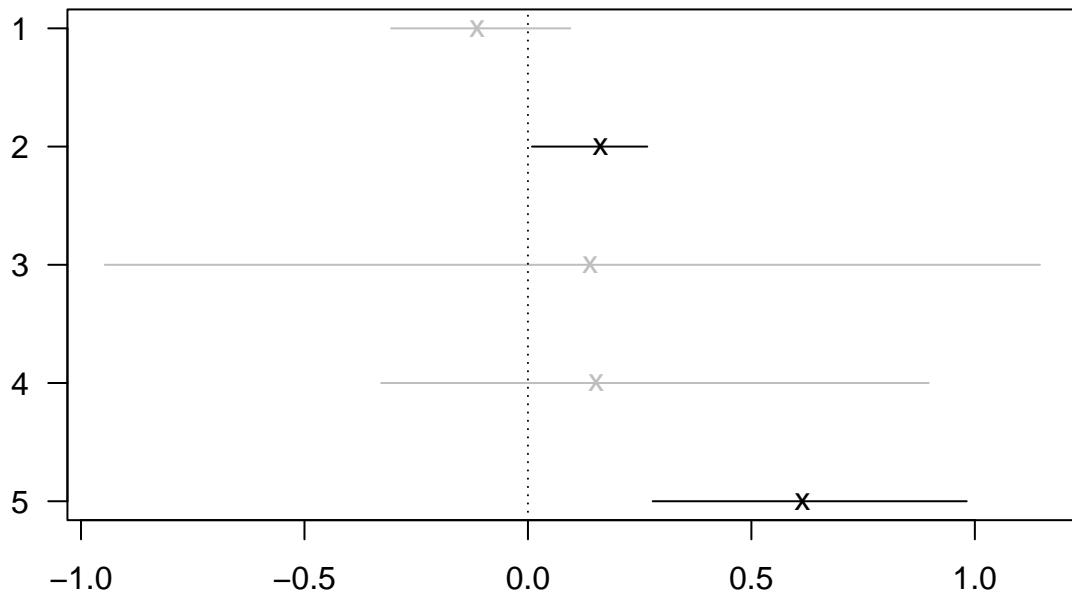
```
coefsplot(covname = "avlength", object = paramod) #Length
```

avlength



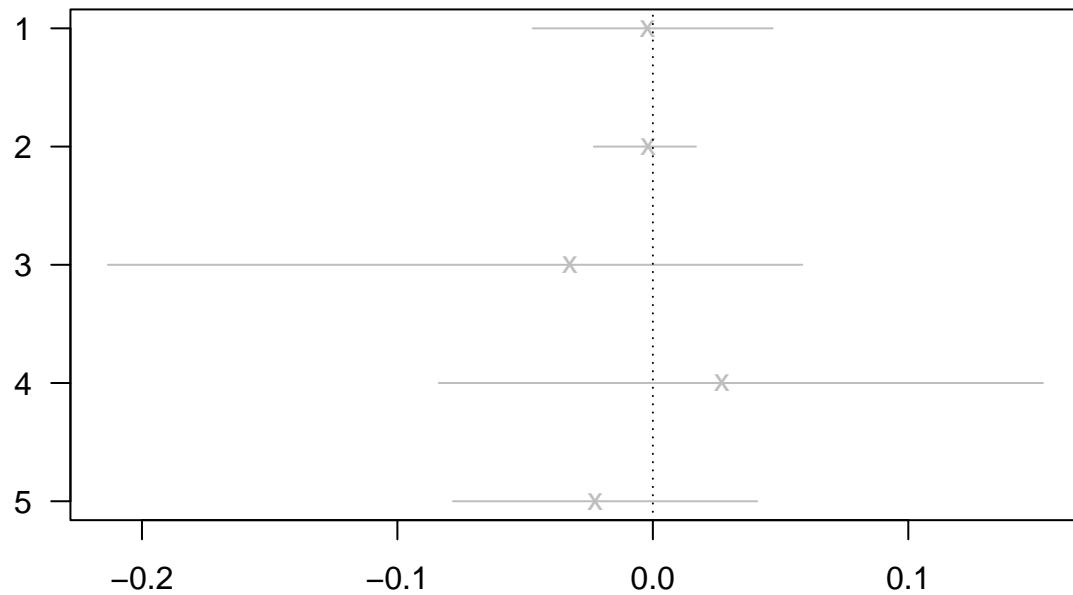
```
coefsplot(covname = "T", object = paramod) #Temperature
```

T



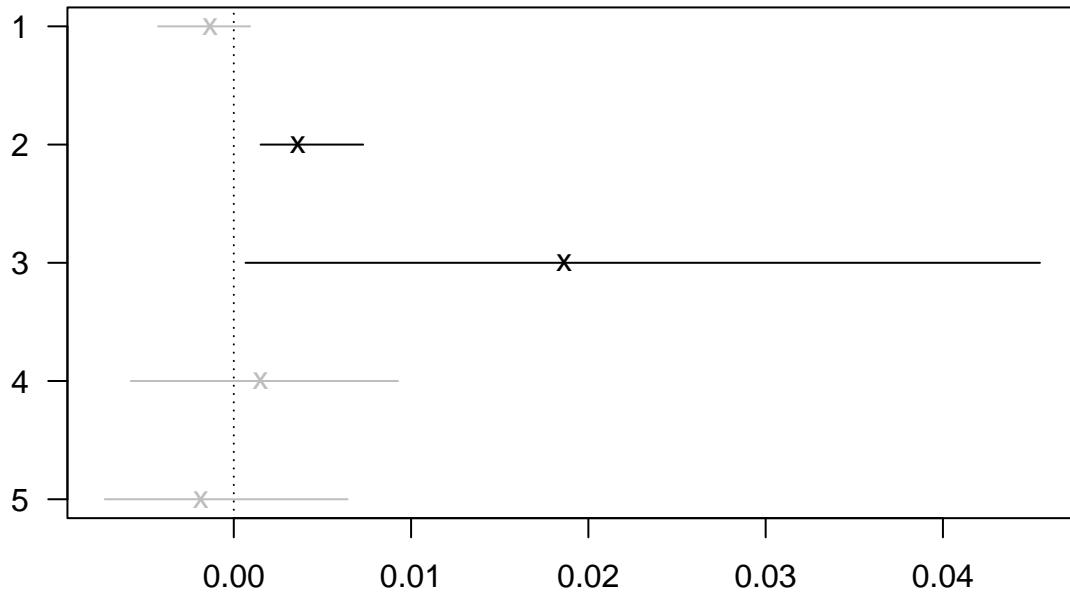
```
coefsplot(covname = "O2", object = paramod) #Oxygen
```

O2



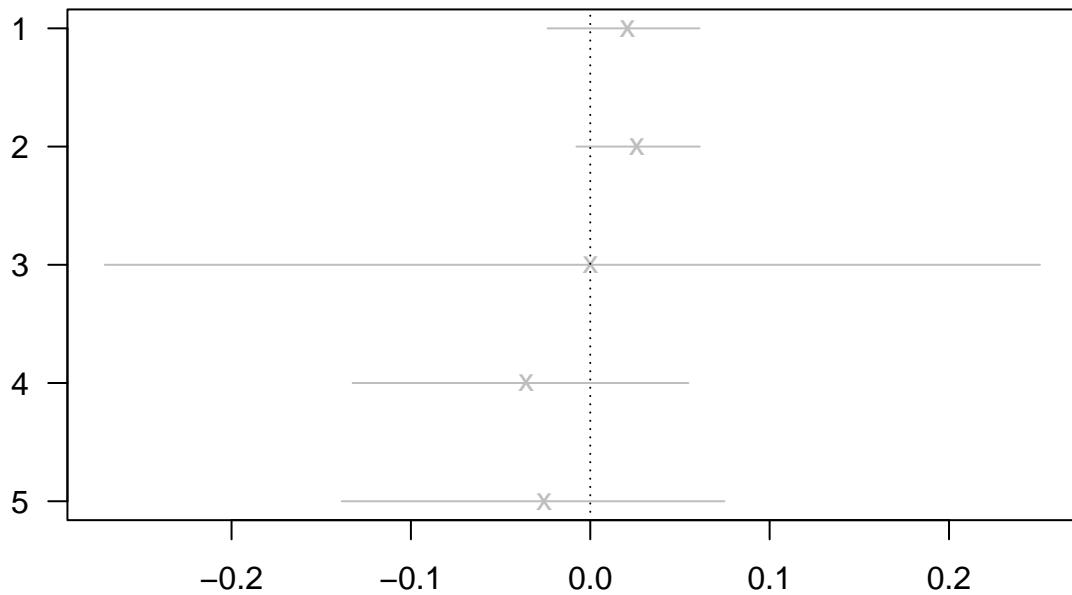
```
coefsplot(covname = "Con", object = paramod) #Conductivity
```

Con



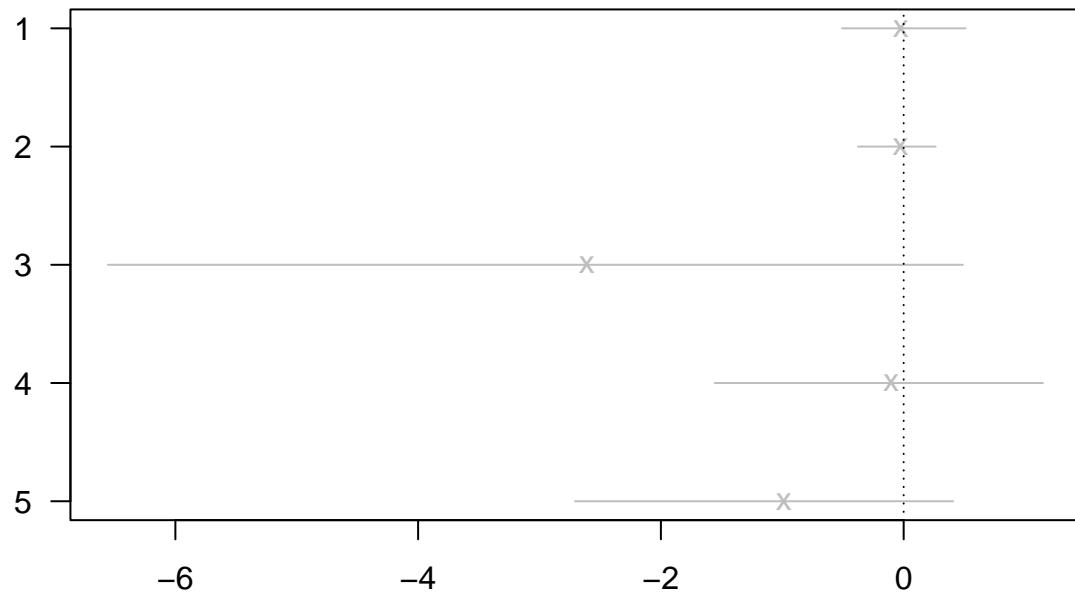
```
coefsplot(covname = "COD", object = paramod) #COD
```

COD



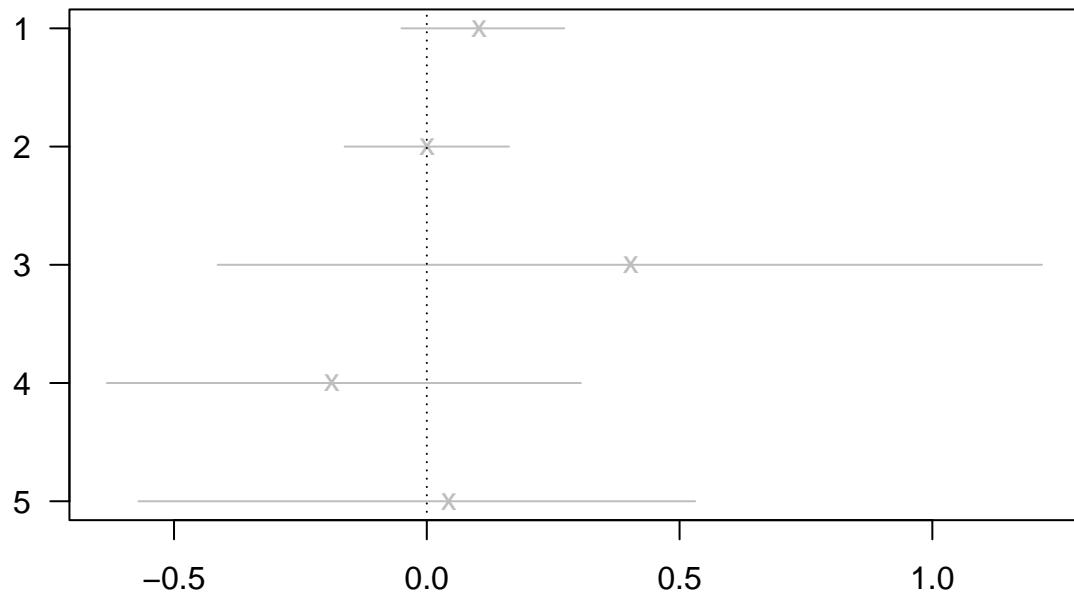
```
coefsplot(covname = "NH4", object = paramod) #NH4
```

NH4



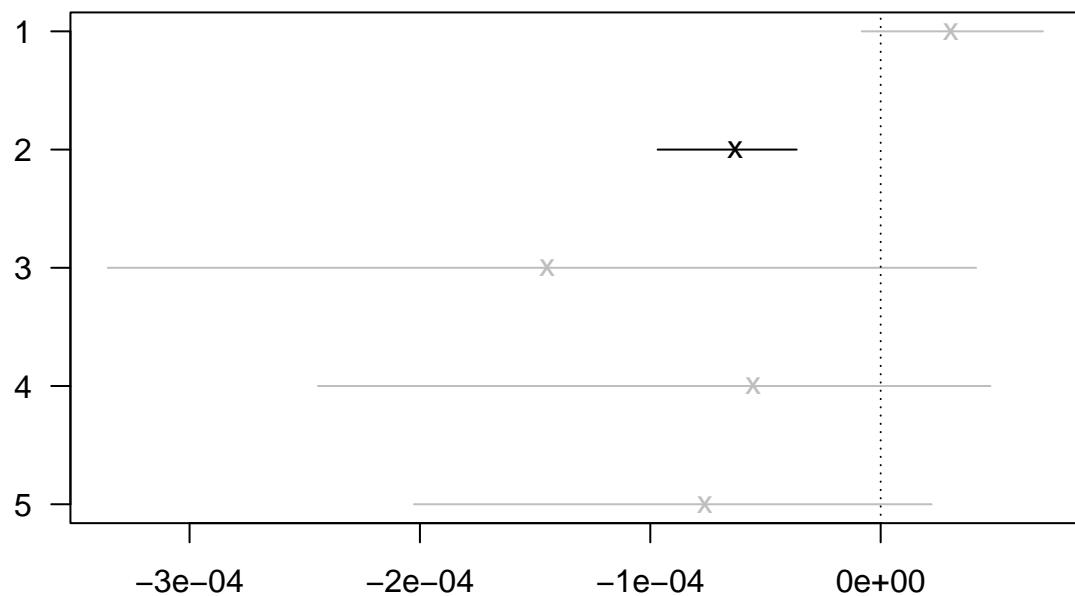
```
coefsplot(covname = "Nt", object = paramod) #Nt
```

Nt



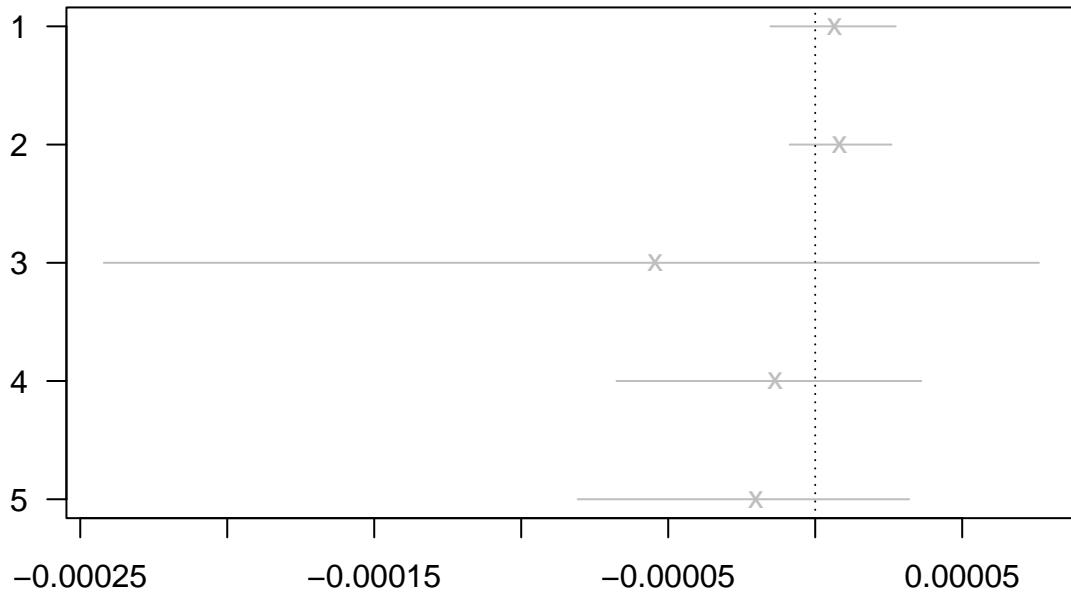
```
coefsplot(covname = "netcen", object = paramod) #netcen
```

netcen



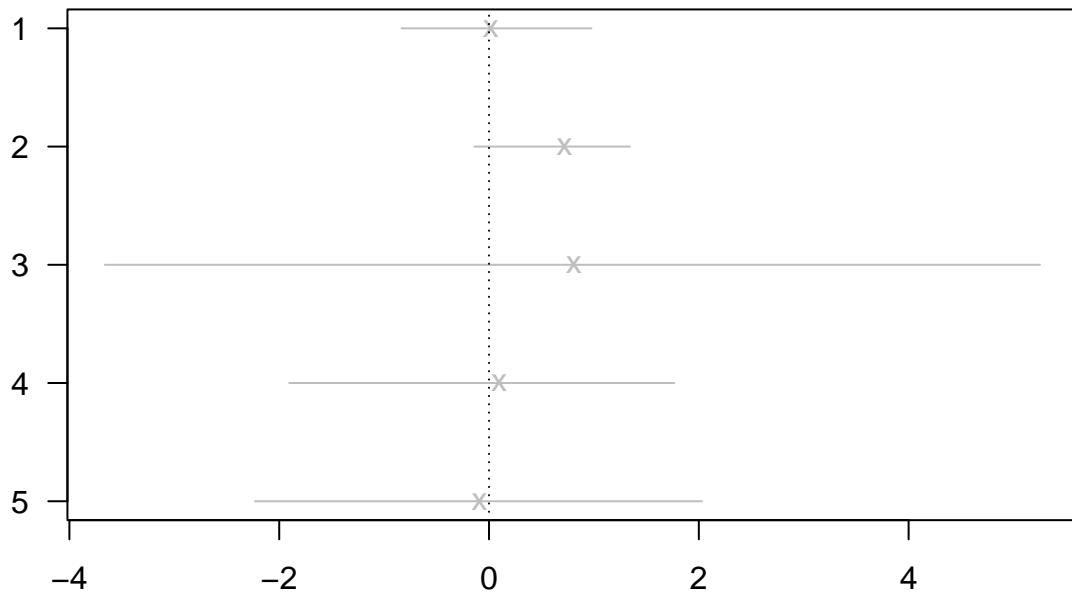
```
coefsplot(covname = "updist", object = paramod) #updist
```

updist



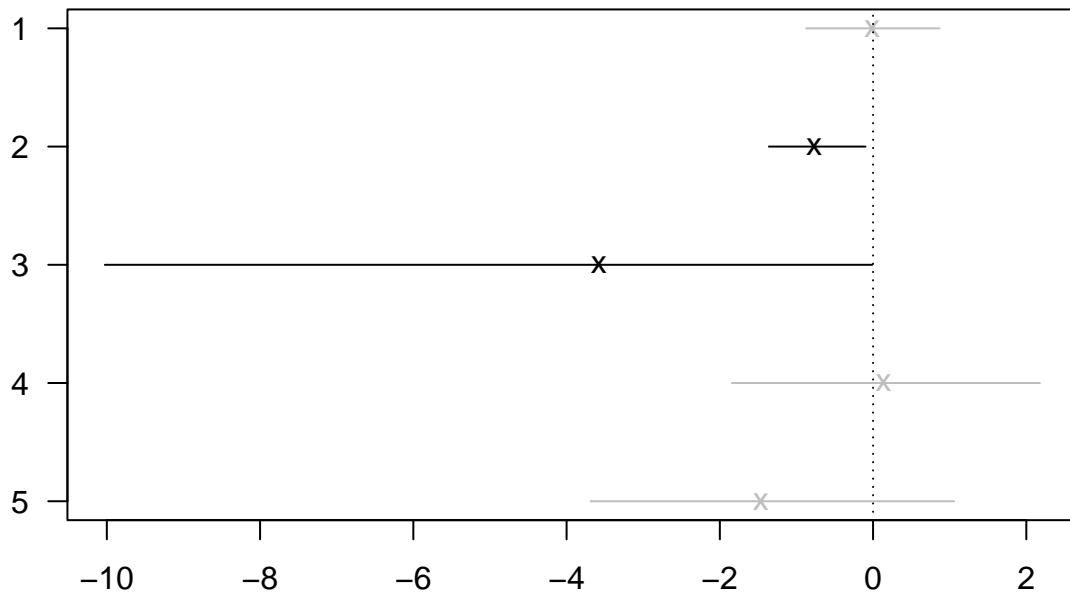
```
coefsplot(covname = "pool_riffle", object = paramod) #poolriffle
```

pool_riffle



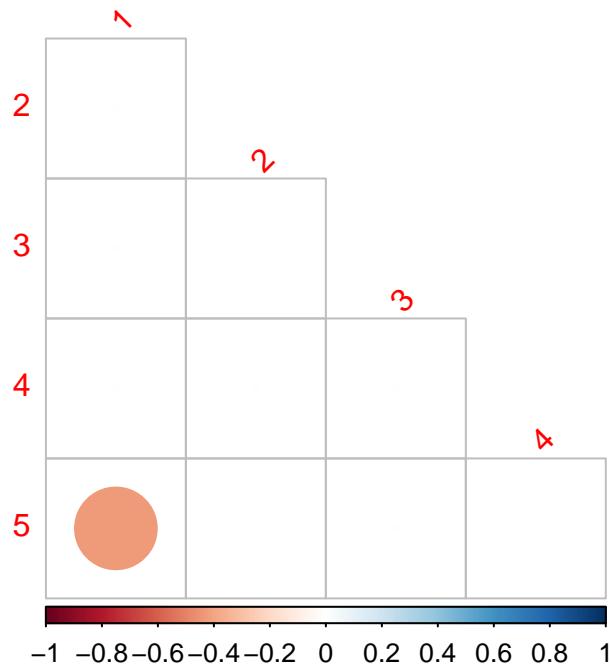
```
coefsplot(covname = "meander", object = paramod) #meander
```

meander



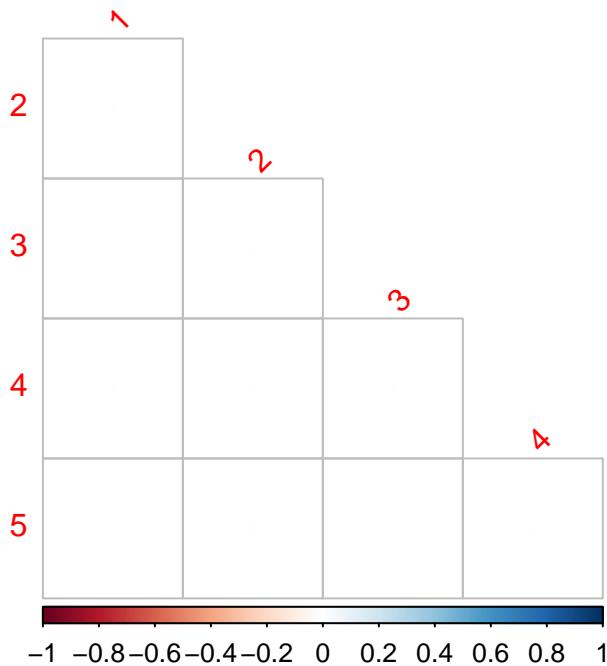
```
envcors <- get.enviro.cor(paramod)
rescors <- get.residual.cor(paramod)
corrplot(envcors$sig.cor, type = "lower", diag = FALSE, title = "Correlations due to covariates", mar =
```

Correlations due to covariates



```
corrplot(rescors$sig.cor, type = "lower", diag = FALSE, title = "Residual correlations", mar = c(3,0.5,1,1))
```

Residual correlations

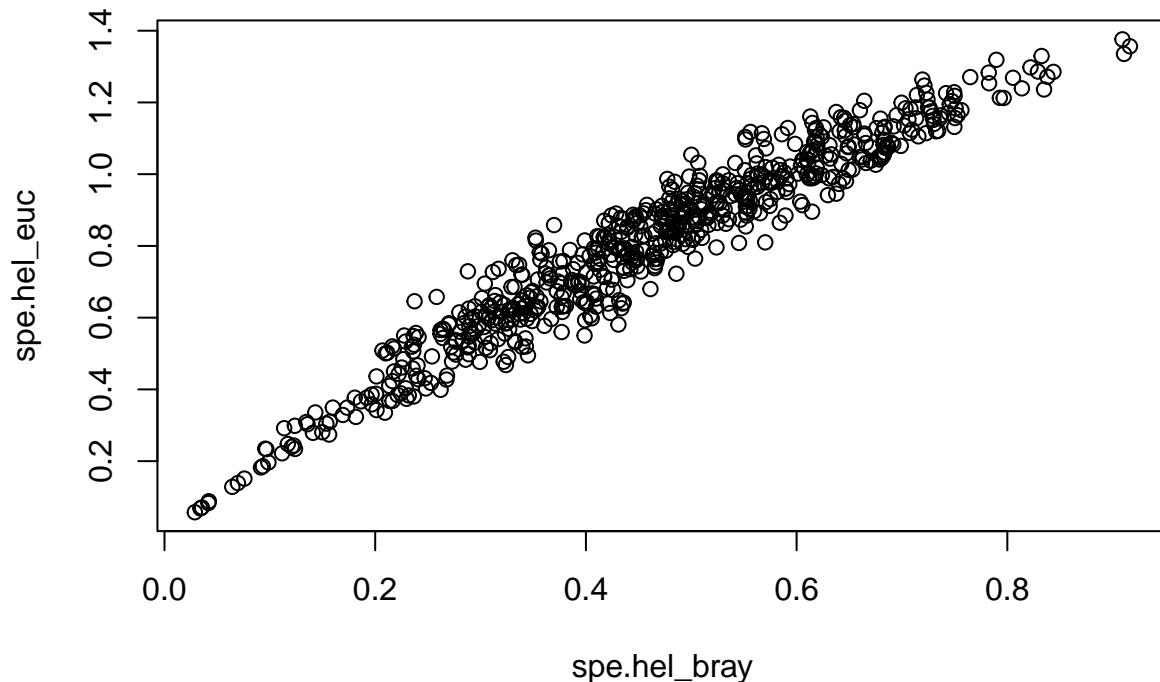


8. Multivariate analysis

8.1 Component communities

```
# Component communities: Bray-Curtis dissimilarities based on Hellinger transformed average abundance data
spe.hel_bray <- vegdist(decostand(avab[,-1], na.rm=T, method="hellinger"), method="bray", na.rm=T)

# Check whether Euclidean and Bray-Curtis distances are comparable
spe.hel_euc <- vegdist(decostand(avab[,-1], na.rm=T, method="hellinger"), method="euc", na.rm=T)
plot(spe.hel_bray, spe.hel_euc)
```



```
mantel(spe.hel_bray, spe.hel_euc)
```

```
##
## Mantel statistic based on Pearson's product-moment correlation
##
## Call:
## mantel(xdis = spe.hel_bray, ydis = spe.hel_euc)
##
## Mantel statistic r: 0.9648
##      Significance: 0.001
##
## Upper quantiles of permutations (null model):
##    90%   95% 97.5%   99%
## 0.103 0.122 0.158 0.186
## Permutation: free
## Number of permutations: 999
```

```
adonis(spe.hel_bray ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
       + NH4_av + Nt_av + pool_riffle + meander + netcen +
       updist, data=environment2)
```

```
## 'adonis' will be deprecated: use 'adonis2' instead
```

```
## $aov.tab
```

```

## Permutation: free
## Number of permutations: 999
##
## Terms added sequentially (first to last)
##
##          Df SumsOfSqs MeanSqs F.Model      R2 Pr(>F)
## avlength     1   0.1863  0.18629  1.8398 0.04303  0.126
## avcondition  1   0.1305  0.13055  1.2893 0.03016  0.279
## T_av         1   0.3204  0.32039  3.1643 0.07401  0.014 *
## O2_sat_av    1   0.1368  0.13678  1.3509 0.03160  0.269
## Con_av       1   0.1326  0.13262  1.3098 0.03064  0.270
## COD_av       1   0.0657  0.06568  0.6486 0.01517  0.629
## NH4._av      1   0.2040  0.20399  2.0146 0.04712  0.103
## Nt_av         1   0.1451  0.14509  1.4329 0.03352  0.257
## pool_riffle   1   0.0853  0.08529  0.8424 0.01970  0.524
## meander        1   0.2029  0.20286  2.0035 0.04686  0.097 .
## netcen         1   0.2173  0.21728  2.1459 0.05019  0.069 .
## updist         1   0.0719  0.07193  0.7104 0.01662  0.608
## Residuals     24   2.4301  0.10125           0.56137
## Total          36   4.3288           1.00000
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## $call
## adonis(formula = spe.hel_bray ~ avlength + avcondition + T_av +
##          O2_sat_av + Con_av + COD_av + NH4._av + Nt_av + pool_riffle +
##          meander + netcen + updist, data = environment2)
##
## $coefficients
## NULL
##
## $coef.sites
##          [,1]          [,2]          [,3]          [,4]
## (Intercept) 5.508408e-01 -5.273740e-02 -2.434806e-01 9.195991e-02
## avlength    -6.730327e-03 -5.154478e-03 -3.437304e-03 3.017426e-03
## avcondition 3.533446e-01  6.299677e-01  6.705073e-01 -1.509499e-01
## T_av        1.118039e-02 -1.547332e-02  2.284308e-02 3.609975e-02
## O2_sat_av   -1.952659e-03  3.216838e-03 -2.736684e-03 -3.275301e-03
## Con_av      -5.105173e-04 -7.421868e-05 -2.766052e-04 -2.644205e-04
## COD_av      -2.877120e-03  2.012742e-03 -5.828066e-04 2.055569e-03
## NH4._av     2.840428e-02  2.361253e-02 -5.333225e-02 -1.083596e-01
## Nt_av        -1.398084e-02  3.352012e-03  1.765257e-02 1.505213e-02
## pool_riffle1 1.768819e-02 -5.367793e-04  3.673375e-03 2.606624e-02
## meander1    -7.321195e-02 -1.737680e-02  3.462634e-02 -6.906184e-03
## netcen       5.687407e-06  3.122369e-06  6.705984e-06 7.354323e-06
## updist       -7.990288e-07 -3.330355e-07  1.097578e-07 -1.418553e-06
##          [,5]          [,6]          [,7]          [,8]
## (Intercept) 3.417559e-01  6.599748e-01 -6.656732e-01 1.232299e+00
## avlength    -5.220827e-03 -8.875861e-03  1.624719e-02 -8.270956e-03
## avcondition 7.063362e-01  5.898287e-01 -9.628888e-02 1.786671e-01
## T_av        3.555749e-03 -2.036964e-02  7.082503e-02 -1.630523e-02
## O2_sat_av   -3.559094e-03 -3.677428e-03 -1.366724e-03 -3.240107e-03
## Con_av      -2.630009e-04 -3.274615e-04  1.607746e-04 -2.325954e-04
## COD_av      -1.859208e-03 -1.344927e-03 -2.168911e-03 -1.552806e-03

```

```

## NH4._av      -1.230503e-02 -6.366620e-03 -2.906617e-02  3.139836e-02
## Nt_av       3.624518e-03  6.253769e-03 -2.142983e-02  2.965146e-04
## pool_riffle1 -1.857388e-02 -1.937103e-02  1.767055e-02 -2.156985e-02
## meander1    3.644385e-03 -3.037137e-02 -3.142557e-02 -1.319176e-02
## netcen      4.247947e-06  8.553556e-06 -2.836475e-06  2.289602e-06
## updist     -1.160792e-06 -1.516476e-06 -9.041883e-07 -5.879432e-07
##             [,9]      [,10]      [,11]      [,12]
## (Intercept) 1.193606e-02 -6.431572e-01  1.029606e+00  9.925732e-02
## avlength    1.017386e-02  1.482368e-02 -5.945561e-03 -3.107184e-03
## avcondition 1.420036e-01 -7.065401e-02  1.459360e-01  2.553069e-01
## T_av        3.532679e-02  6.659019e-02 -1.879500e-02  4.397943e-03
## O2_sat_av  -1.109085e-03 -1.780974e-03  9.211405e-05  1.062527e-04
## Con_av      2.249288e-04  4.161917e-05 -2.084932e-04 -1.073458e-04
## COD_av     -2.925292e-03 -2.013086e-03 -1.816569e-03 -1.936453e-04
## NH4._av     1.700026e-03 -3.587351e-02  7.085431e-02 -3.570309e-04
## Nt_av      -2.464491e-02 -2.042881e-02 -2.756268e-02 -2.613938e-03
## pool_riffle1 5.149964e-03  2.434934e-02 -7.384338e-03 -1.940375e-02
## meander1   -3.592391e-02 -3.093900e-02 -1.011602e-01 -2.896967e-02
## netcen     -4.890078e-06  2.155102e-08  2.116885e-07  3.898399e-06
## updist     -2.556568e-06 -9.169728e-07 -4.186830e-07  9.989285e-07
##             [,13]      [,14]      [,15]      [,16]
## (Intercept) -6.368613e-01  7.803088e-01 -7.166398e-01  6.265197e-01
## avlength    1.681428e-02 -1.615996e-02  1.599244e-02 -4.870955e-04
## avcondition -9.852280e-02  1.116504e+00 -8.864468e-02 -2.266528e-01
## T_av        6.899743e-02 -5.281902e-02  7.019720e-02 -2.675075e-02
## O2_sat_av  -1.154303e-03  8.408912e-04 -1.528332e-03  2.683281e-03
## Con_av      2.133819e-04 -1.628458e-04  1.210939e-04  9.193730e-05
## COD_av     -2.256399e-03 -3.417431e-04 -1.905709e-03  1.685274e-03
## NH4._av     -2.351319e-02  2.216998e-02 -3.305408e-02 -2.101423e-03
## Nt_av      -2.236658e-02  2.414900e-02 -2.133049e-02 -4.373715e-03
## pool_riffle1 1.777876e-02 -1.073611e-02  2.225968e-02 -1.085855e-02
## meander1   -3.052164e-02  2.795040e-02 -3.051222e-02 -2.956997e-02
## netcen     -3.753005e-06  2.977032e-06 -1.286598e-06  3.095126e-06
## updist     -1.122169e-06 -7.836708e-07 -8.604971e-07  2.315622e-07
##             [,17]      [,18]      [,19]      [,20]
## (Intercept) -6.121613e-01 -6.298597e-01  3.672728e-01 -4.193382e-01
## avlength    1.697894e-02  2.055352e-02 -7.171231e-04  1.005516e-02
## avcondition -7.389408e-02 -6.777901e-02 -2.887636e-02 -5.762375e-02
## T_av        6.585840e-02  6.131461e-02  4.014584e-03  4.493748e-02
## O2_sat_av  -8.101716e-04  5.594262e-05  2.683683e-03 -8.807157e-04
## Con_av      2.549962e-04  3.822115e-04 -2.856617e-04  4.572917e-05
## COD_av     -2.152015e-03 -2.748748e-03 -1.553914e-03 -1.849240e-03
## NH4._av     -1.868318e-02  4.450495e-03  7.811332e-02 -4.979537e-03
## Nt_av      -2.305085e-02 -2.703083e-02 -1.925957e-02 -1.841033e-02
## pool_riffle1 1.402088e-02  5.461863e-03  4.427048e-02  1.431926e-02
## meander1   -2.516039e-02 -7.084940e-03 -9.584558e-02 -5.261891e-02
## netcen     -4.556663e-06 -6.879221e-06  1.369068e-06  8.289165e-07
## updist     -1.287669e-06 -1.451850e-06  1.280760e-06  6.116341e-09
##             [,21]      [,22]      [,23]      [,24]
## (Intercept) -6.532464e-01  4.100449e-02  1.704589e-01  6.462801e-01
## avlength    2.319031e-02 -7.043442e-03  3.719695e-03 -1.151131e-02
## avcondition -1.226451e-01  4.981712e-01 -2.975572e-01  2.656163e-01
## T_av        6.921670e-02  9.203739e-03  3.604248e-02  3.693320e-03
## O2_sat_av  -5.363793e-04 -3.377174e-03 -2.104368e-03 -3.267513e-03

```

```

## Con_av      4.666038e-04 -4.483003e-04 -3.957322e-04 -7.538767e-04
## COD_av     -3.665123e-03  1.139311e-04 -1.331837e-03 -1.247580e-03
## NH4._av     1.098478e-02 -5.822747e-02  7.918302e-04 -5.527844e-03
## Nt_av       -2.846609e-02  2.913377e-02 -1.519403e-02  1.263706e-02
## pool_riffle1 5.976844e-03 -2.818818e-03  3.112259e-02  5.198239e-03
## meander1    -4.555456e-03  1.470428e-02 -8.750494e-02 -6.113122e-02
## netcen      -7.704644e-06  1.084062e-05  6.382930e-06  1.250120e-05
## updist      -1.047127e-06  5.517250e-07 -2.895584e-07  1.103984e-06
##                  [,25]          [,26]          [,27]          [,28]
## (Intercept) 6.769474e-01  6.020722e-03  7.029508e-01 -6.495116e-01
## avlength    6.564463e-03 -3.847984e-03 -5.761959e-03  4.172387e-03
## avcondition -4.822334e-01  3.529973e-01 -1.612682e-01  5.898298e-01
## T_av        2.561781e-02  1.361892e-03 -4.982493e-03  4.612126e-02
## O2_sat_av   1.904383e-03  2.383360e-04  6.440399e-04 -1.955014e-03
## Con_av      2.945301e-04 -1.586756e-04 -5.006992e-04 -1.366137e-04
## COD_av      2.920903e-04 -8.000102e-05 -1.425778e-03 -2.044311e-03
## NH4._av     2.523120e-02 -4.970698e-03  3.710533e-02 -2.533041e-02
## Nt_av       -3.061194e-02  8.474961e-04 -4.119371e-03  3.362813e-03
## pool_riffle1 1.748158e-02 -1.825549e-02  2.758115e-02  1.081138e-02
## meander1    -5.239307e-03 -2.501497e-02 -9.167294e-02  1.744373e-02
## netcen      -8.945792e-06  5.603190e-06  8.449204e-06  1.762466e-06
## updist      -2.988354e-07  8.492801e-07  1.866830e-06  1.009091e-06
##                  [,29]          [,30]          [,31]          [,32]
## (Intercept) 1.664279e+00  6.279966e-01 -1.746030e-01  4.404427e-01
## avlength   -1.236214e-02 -7.011657e-03  7.012405e-03 -1.778983e-03
## avcondition 2.858156e-01  4.234981e-01 -2.258974e-01  1.622057e-01
## T_av        -5.986930e-02 -2.173927e-03  5.234007e-02  9.365206e-03
## O2_sat_av   -3.463527e-04 -1.347510e-03 -3.029788e-03 -2.410160e-03
## Con_av      -4.356963e-05 -3.400522e-04 -2.095022e-04 -3.845398e-04
## COD_av      1.130715e-03 -3.344424e-03  6.944179e-04 -2.171721e-03
## NH4._av     2.536027e-02  6.093858e-02 -7.590807e-02  5.297513e-03
## Nt_av       -5.922196e-03 -1.726172e-02  5.007697e-04 -9.117520e-03
## pool_riffle1 -5.179915e-02  4.786601e-03  3.134113e-02  2.786768e-02
## meander1    -4.388545e-02 -8.632094e-02 -2.294827e-02 -6.533310e-02
## netcen      1.380107e-06  2.562367e-06  5.466809e-06  6.786009e-06
## updist      -1.505678e-06  3.457645e-07 -1.297399e-06 -1.391436e-06
##                  [,33]          [,34]          [,35]          [,36]
## (Intercept) 3.101886e-01 -2.542264e-01 -2.501988e-01  8.628936e-01
## avlength   -3.162267e-03  7.673672e-03 -2.941552e-03 -9.795749e-03
## avcondition 4.018815e-02 -7.033370e-02  5.630407e-01  5.245065e-01
## T_av        -2.895238e-03  5.432776e-02  2.745586e-02 -2.040254e-02
## O2_sat_av   2.413948e-03  5.390887e-04 -3.582597e-03 -2.035098e-03
## Con_av      -3.367390e-04 -2.833619e-04 -3.887135e-04 -2.231771e-04
## COD_av      -6.546298e-04 -3.187515e-03  4.168535e-04 -1.534188e-03
## NH4._av     4.520826e-02  3.397592e-02 -8.031235e-02  2.546175e-02
## Nt_av       -1.636260e-02 -2.714229e-02  2.683761e-02  1.781403e-02
## pool_riffle1 6.586967e-04  3.365024e-02  4.205757e-03  6.631058e-03
## meander1    -8.882833e-02 -8.347203e-02  3.115884e-02  2.286827e-02
## netcen      5.008203e-06 -1.089956e-07  8.862842e-06  2.456590e-06
## updist      1.614076e-06  1.190913e-06  6.126184e-08  6.118538e-07
##                  [,37]
## (Intercept) -1.060510e-01
## avlength    3.588634e-03
## avcondition 1.124134e-01

```

```

## T_av           4.012527e-02
## O2_sat_av    -2.040541e-03
## Con_av        -2.358599e-04
## COD_av        -2.983090e-03
## NH4._av       1.721446e-02
## Nt_av         -1.453435e-02
## pool_riffle1  1.079718e-02
## meander1      -6.948440e-02
## netcen         2.399692e-06
## updist         7.900733e-07
##
## $f_perms
##          [,1]          [,2]          [,3]          [,4]          [,5]
## [1,]  2.114628225  1.5543234069  1.702689478  1.339531771  3.108426685
## [2,]  0.214885960  3.4657898036  0.751084789  0.763362770  1.456194238
## [3,]  0.385793364  0.4430296573  1.020867892  0.973410895  1.750514972
## [4,]  1.329928036  1.4295412166  2.832407093  0.851436500  0.615704603
## [5,]  0.904293043  0.9767040251  1.555189810  1.611803197  1.256954726
## [6,]  0.993866088  3.0271185646  0.657706154  1.056385795  0.919433618
## [7,]  0.299813040  1.5004811655  0.884591797  1.885864479  1.575968245
## [8,]  0.223311915  0.0495509952  0.332054631  1.521249635  0.568025386
## [9,]  0.812112951  0.7925741800  0.266689369  1.100406753  3.159251513
## [10,] -0.027074037  0.7360938352  0.459119878  1.641907721  1.979482291
## [11,]  0.456383522  1.0024632049  1.182124266  0.200209104  0.527138529
## [12,]  2.048508693  0.4920270919  0.758806905  1.089583730  0.075247268
## [13,]  0.398281612  0.9589395057  0.677608827  0.178858845  2.136210878
## [14,]  1.889063912  0.1837152980  0.927602307  0.307458134  1.116012392
## [15,]  0.169142865  0.2968415777  0.283810355  1.485894102 -0.141524113
## [16,]  0.346249300  0.4331492001  0.676991390  0.001798629  1.988563664
## [17,]  0.796455479  2.1246426616  1.356681325  1.016799044  0.055190794
## [18,]  0.965858987  1.4235877081  1.151778979  2.362111892  1.636029766
## [19,]  0.384253972  0.5133930278  0.487095727  0.759005683  0.818251410
## [20,]  2.341186252  1.6662742818  2.744603137  1.408864882  3.920811716
## [21,]  2.659299460  2.9233464046  1.312697767  1.935203506 -0.067976752
## [22,]  2.722028400  0.6900297515  0.637235726  1.631898090  0.088544369
## [23,]  1.276803646  0.3031532012  1.117064267  1.388072501  0.521386269
## [24,]  1.515939218  1.8860767597  1.674894648  0.876101449  1.900287665
## [25,]  1.020689456  1.0736941376  0.445160088  0.408992296  2.050172964
## [26,]  0.726521568  0.6392774097  0.379054506  0.213620729  0.400563849
## [27,]  0.795203674  1.4519877292  0.888578350  0.891278178  0.380314386
## [28,]  0.485523512  0.7290035271  0.946056739  0.486221140  1.297350591
## [29,]  0.780109960  0.7925482432  1.576011759  0.974712795  0.879381864
## [30,]  1.092859848  0.2820841422  0.525938187  0.079574421  0.890265912
## [31,]  0.660135570  0.4840626980  0.622213070  1.145713682  0.487653748
## [32,]  1.542578060  0.8913510490  0.503809528  1.257133302  1.023514151
## [33,]  1.290092692 -0.0729834463  1.703663847  0.651521769  0.659184396
## [34,]  1.673250428  1.5986354376  0.253915265  1.368807561  0.433729899
## [35,]  1.089734520  0.9323588558  2.115726401  0.939153767  0.850859040
## [36,]  0.555074600  1.5146690779  1.930508762  0.215815589  1.499258701
## [37,]  0.302239239  0.8958732359  0.343187419  0.394607073  0.955527874
## [38,]  0.903709640  0.1003721156  0.400040321  0.772573138  0.731825242
## [39,]  0.836660169  0.7657580202  1.142838517  4.381471964  0.469055853
## [40,]  0.843303143  0.7021052786  1.506013746  0.767886036  1.234663552
## [41,]  1.527622741  0.6364393292  1.423096211  0.260622033  0.268535478

```

```

## [42,] 0.962918337 1.4733439250 0.579018341 0.272964845 0.575337941
## [43,] 1.646577558 0.7614296356 1.042883550 0.572818159 0.761943517
## [44,] 0.331693578 0.7786487029 0.473857866 2.771070137 0.761295662
## [45,] 1.878642347 0.7319264915 2.283980674 1.157592962 2.848107082
## [46,] 0.983693196 0.8892116245 0.130263739 0.958983859 1.559700061
## [47,] 1.569497264 2.0365398884 0.526526539 1.002646951 0.650943027
## [48,] 0.154918066 1.4311351783 0.655108435 2.176194641 0.633460029
## [49,] 1.641501770 0.3322068015 0.645598025 0.687127433 0.421701169
## [50,] 0.906332882 0.9129378108 0.618709607 1.114842467 0.644296556
## [51,] 0.536566907 1.4356845728 0.615232035 1.839661635 1.428492196
## [52,] 0.791360369 0.4530892946 0.586849527 0.787658040 0.488556518
## [53,] 0.918259964 0.9801463089 0.644559150 0.455293496 0.622561035
## [54,] 0.925675315 1.7188998649 0.509178007 0.232689292 2.742243744
## [55,] 1.762125682 0.9601692177 1.308144656 2.015296335 1.274711678
## [56,] 1.300188291 0.4763465158 0.650862876 1.166343623 0.038133675
## [57,] 1.906495042 1.4068744606 0.969912159 2.394733305 1.083213148
## [58,] 0.196944789 1.7168796390 0.584582496 0.284622878 0.060583189
## [59,] 0.426730783 1.5769456791 0.791451807 1.645940263 1.259779381
## [60,] 1.110452782 0.4234353122 0.692211043 1.344056299 0.450872606
## [61,] 0.291489010 0.1335801821 0.959524679 0.400493398 0.219102591
## [62,] 1.075478700 -0.0303759169 2.439550048 0.931382368 0.824293622
## [63,] 2.146409970 0.1375918325 0.766296939 1.852658772 0.701223590
## [64,] 0.639576833 1.3308446542 0.274221607 0.721076195 0.333428722
## [65,] 0.512409378 0.1620115041 0.980501335 0.131977142 0.208470521
## [66,] 1.817066256 0.8837969320 1.860663608 1.243157020 1.772798317
## [67,] 1.837302741 0.4401778000 0.890378627 1.941656072 0.859409040
## [68,] 0.835656589 0.6594909064 0.714584836 0.845539527 1.244500810
## [69,] 2.482554813 0.7799495800 0.367059841 0.743771011 0.361957937
## [70,] 1.938132644 0.6966303772 1.228102449 1.490875763 1.873434647
## [71,] 1.755506310 0.2062569169 0.851996922 0.269877297 1.304924523
## [72,] 1.147258886 1.0957134859 1.127532622 0.335420075 0.407959796
## [73,] 0.992785447 2.4307261587 0.578309874 0.486097561 1.458356755
## [74,] 0.863599400 0.7431965754 0.208018919 0.728279689 0.543644879
## [75,] 1.024657428 0.6254804682 2.354166748 1.508109786 1.280615253
## [76,] 0.588335114 1.1910273059 1.949397783 3.292743532 3.060924531
## [77,] 1.030796834 0.0698431647 0.732596599 0.500880015 0.766815411
## [78,] 0.250481336 0.9392039205 0.881302394 1.142643946 0.657483702
## [79,] 2.156102998 0.7888255459 1.268540671 1.319606933 0.114744067
## [80,] 0.496948370 0.5618495546 0.289098488 1.635682248 0.989109102
## [81,] 0.347898545 0.6225050739 2.308274057 0.421256692 1.272313655
## [82,] 1.249716606 0.7253606630 0.826929991 0.736513802 0.837690943
## [83,] 0.842872968 1.1394511551 0.492742341 1.987269038 1.209215615
## [84,] 0.859687029 1.0788105845 2.066321131 0.634759070 0.288748573
## [85,] 0.405993331 1.9089022632 2.838048465 1.839201850 1.044031727
## [86,] 0.172474158 1.4666427880 0.086396429 0.151999350 1.386280113
## [87,] 0.718683263 0.8349255384 0.474557354 1.369037387 2.704420830
## [88,] 0.252719929 1.6702318974 1.280244545 0.951749321 0.057651957
## [89,] 2.084472739 0.7967811236 0.300109647 0.751130094 1.263490329
## [90,] 1.518248319 0.2972142056 1.447326341 0.683364863 1.449640918
## [91,] 1.125378390 0.6990505628 0.745765467 1.586258283 0.955016320
## [92,] 1.394580658 0.1901596156 0.967083796 1.621352615 0.296243452
## [93,] 1.247011677 0.7643361206 2.542080648 3.150949862 0.922159226
## [94,] 4.664765700 2.8295851146 0.336804369 0.043937533 0.841968950
## [95,] 1.732918249 0.3324063211 1.012722563 1.393323304 1.403411312

```

##	[96,]	1.259634375	0.4863387388	0.598773561	1.013242593	0.677304929
##	[97,]	0.858214753	0.5666607324	0.981852132	0.997643608	0.600484449
##	[98,]	1.063580089	1.1337781186	0.966659578	1.579840290	0.367221553
##	[99,]	0.552675696	1.3924718239	1.033926372	0.703024503	1.018343613
##	[100,]	1.343161495	0.3778059979	1.559994968	0.339889974	0.885006432
##	[101,]	0.224155706	0.3821947699	2.114437532	0.984698458	0.404546354
##	[102,]	0.805281844	0.2441642396	-0.029670595	0.333810633	0.539614772
##	[103,]	0.457760349	0.4120457894	0.202482136	0.620091619	0.562475983
##	[104,]	0.266682061	0.3072824051	0.805492956	0.930535699	2.276684507
##	[105,]	0.531947804	0.6041754502	0.582770351	0.921147194	-0.222514267
##	[106,]	1.896689491	0.2903430791	1.557281180	0.375451812	0.708171255
##	[107,]	0.734525936	0.8034050275	0.532162346	1.378047985	0.781262622
##	[108,]	0.952480894	1.6571809044	-0.090705457	0.800559066	0.143323696
##	[109,]	0.223371021	0.9118970731	0.542715259	1.851539755	1.145456128
##	[110,]	0.535279413	0.7226127409	0.818077693	1.671695768	1.120300908
##	[111,]	0.367704011	1.5201487203	1.838915799	0.412080575	2.000554391
##	[112,]	0.273056678	1.5755585942	0.431267252	2.199917532	0.409321239
##	[113,]	1.497757650	0.4564713291	0.072393888	0.515566780	1.576258931
##	[114,]	0.514295820	1.2326632470	0.336975057	1.333603002	0.478748147
##	[115,]	1.710913364	1.0699444271	0.772552090	0.042376826	0.241790863
##	[116,]	0.718001481	0.8071236516	0.623941187	1.022283024	3.051861378
##	[117,]	1.048060728	0.4843677720	0.452205762	0.035446307	1.155620923
##	[118,]	0.305963711	0.6154883302	0.554767309	0.715578988	0.901813976
##	[119,]	1.647409818	1.0683030322	0.995532841	0.811250353	2.326264810
##	[120,]	0.875221653	0.2826383328	0.469668736	0.924074061	1.423078631
##	[121,]	0.309796191	0.4613666211	0.595263447	0.525724521	0.097572847
##	[122,]	1.027085495	0.7612515446	0.765462619	0.490232786	0.719709434
##	[123,]	0.889495568	0.2152665489	-0.155688865	2.757743037	0.856934502
##	[124,]	1.455472678	0.9798952700	1.523314194	0.087035896	0.304398563
##	[125,]	1.223003559	1.6009947335	-0.132473852	1.555302446	0.531044616
##	[126,]	1.121643089	1.0613527207	0.910296103	0.625530702	1.139041253
##	[127,]	0.562674848	1.8532850753	1.598730190	1.162241511	1.949183238
##	[128,]	0.188601266	0.3871240860	1.229181861	2.188304041	1.835012242
##	[129,]	0.881073629	0.8973994568	1.058018604	0.494734188	0.437597881
##	[130,]	0.849712055	0.3758184549	0.608473944	1.115388284	0.188741117
##	[131,]	0.387889615	0.4222419525	1.132138997	1.464611677	0.208783778
##	[132,]	0.841152746	2.2406037911	1.113249743	1.533869970	0.904689071
##	[133,]	1.169058820	0.6925650501	2.890206517	0.284171582	0.538001157
##	[134,]	1.968268136	2.2367375327	0.746726791	0.664971612	1.018526787
##	[135,]	0.565591143	0.3607256517	1.701176853	0.714173337	0.503954195
##	[136,]	0.570720161	0.0710633252	0.728173685	0.341910045	1.809129008
##	[137,]	1.246038500	0.0168546832	0.548627418	1.057006901	0.359986178
##	[138,]	1.689756088	0.3903798442	1.031510218	1.534532724	1.709099345
##	[139,]	1.613189640	0.8870322341	0.974841267	0.861967700	1.401336295
##	[140,]	0.896265676	1.5610160236	2.125144854	0.529319975	1.174411487
##	[141,]	0.949876513	0.6021973298	0.326478369	1.061011500	0.484109307
##	[142,]	0.547059574	1.8398368711	0.326022210	0.124459095	0.880857761
##	[143,]	2.812979462	0.4671015472	1.499965563	0.450213269	1.019592857
##	[144,]	1.327118918	0.2845317995	0.687472886	0.501298553	0.272461081
##	[145,]	0.875424409	0.3252983938	2.189417847	0.471645226	0.601820684
##	[146,]	0.425761193	0.0449414877	0.184026586	0.721679111	3.167804214
##	[147,]	1.371413741	1.3888812900	1.687996162	0.885858131	0.886404505
##	[148,]	3.110156944	1.2846641516	1.085333142	0.402708646	0.440263126
##	[149,]	0.281502042	0.4134280776	1.074737609	0.877414346	0.709513560

```

## [150,] 1.158016557 0.7086785562 0.448742896 -0.014116850 0.955587652
## [151,] 1.475288474 1.8998834839 0.444658960 0.272185652 0.624870960
## [152,] 1.068558887 0.6728704602 0.943356242 2.310736394 1.909676078
## [153,] 0.455987522 0.9191693577 0.806862851 0.948175933 1.338373970
## [154,] 0.551190570 0.4707475492 1.295882321 1.087230793 1.565111069
## [155,] 1.494762216 1.1370759066 1.802450638 0.864259568 -0.022004790
## [156,] 0.459397303 2.6818137567 1.627118634 0.856113468 0.991019306
## [157,] 0.617256113 0.5321971856 0.542872956 0.464030834 1.188993522
## [158,] 1.733867057 0.7221697408 0.950003175 0.940346976 1.686265582
## [159,] 1.584488674 0.3611024226 2.459364105 1.697422479 0.096846005
## [160,] 1.7677792984 1.6050659359 1.367541409 1.070058043 0.370795729
## [161,] 0.929739707 -0.0103074159 1.808706210 0.571562879 2.012468763
## [162,] 0.447623296 0.7997020190 0.489907037 0.162129369 1.002080905
## [163,] 0.675128539 0.0576462930 1.925829642 0.214197990 1.364634444
## [164,] 0.574252911 0.0787378470 1.770473075 0.281006650 0.649165864
## [165,] 0.214202942 0.5426908634 0.870488702 1.622307696 2.144384629
## [166,] 0.625986249 0.8760126344 0.574464089 2.130927234 0.331042651
## [167,] 1.998585592 0.9346161302 1.146369450 2.218639221 0.911445184
## [168,] 0.568666519 1.4954112149 0.604799660 0.650053849 0.178289866
## [169,] 5.116951119 0.7616118133 1.131586391 0.769123715 1.779828343
## [170,] 0.518310460 0.8959663031 3.066501560 0.478112233 0.020269036
## [171,] 1.251665039 1.1852899670 1.056826943 0.887253891 0.630673259
## [172,] 0.675605008 2.8769430167 0.862189371 3.842132993 0.905404945
## [173,] 0.402144436 0.9958772748 1.870198126 0.856171305 0.277674660
## [174,] 1.394954578 1.3852246912 0.571032306 3.854371185 0.964066747
## [175,] 1.425215511 0.2999706627 0.367862998 0.526441536 1.330560500
## [176,] 1.167840314 1.6167794570 0.957507974 0.652259366 1.010142680
## [177,] 0.339887858 0.3408835488 0.168926178 0.291244433 0.900887974
## [178,] 0.211488789 1.2325352613 0.288953309 0.767354102 0.666153933
## [179,] 1.519569011 0.7497525172 1.956420657 2.947091693 1.260044901
## [180,] 0.778324505 1.6316667350 1.108405324 1.104362008 1.050511031
## [181,] 0.022764112 1.8883527934 0.701517149 1.560192697 1.428623715
## [182,] 2.587655768 0.0813172143 -0.100870397 2.216942556 0.411825388
## [183,] 0.795729380 1.0512936301 0.577952895 1.064249861 1.137815818
## [184,] 0.185440924 0.3201471538 1.369951535 1.045577922 0.389479960
## [185,] 0.777681967 0.6001199087 0.234077038 0.341538159 0.451548368
## [186,] 1.205621015 1.0343339068 0.695408880 0.010139761 1.013268183
## [187,] 1.154482258 1.3640140379 2.232491377 0.105585074 2.201390701
## [188,] 1.628019211 0.5784547561 2.785381738 1.764611774 0.531771327
## [189,] 0.355969629 1.7746970682 1.215932635 0.633222438 0.828790861
## [190,] 1.213353826 2.0657697427 0.659623099 1.057340955 0.923853306
## [191,] 1.755445250 1.2128665905 0.087561828 1.006879916 0.763542305
## [192,] 0.455162345 0.6640476993 3.824133096 0.815192610 0.987565643
## [193,] 0.895814359 0.2786954762 1.735717020 0.367777712 2.227937197
## [194,] 0.855478195 0.5230182532 0.868341089 0.255421080 1.767420955
## [195,] 1.653452875 0.8350464554 1.042531541 0.805634345 0.355934878
## [196,] 0.623950388 1.4615470534 0.226528598 1.028535073 0.671280812
## [197,] 2.599342874 2.0036793245 0.456326165 1.551633961 2.091017442
## [198,] 1.369204638 1.8386349366 1.224350926 1.030983987 0.924843288
## [199,] 1.981865915 1.4600264235 1.755559588 0.409235129 0.200058261
## [200,] 1.983294024 1.9593815911 1.158500779 1.487166102 1.072782439
## [201,] 1.303318205 1.1191835015 0.718010049 0.543571172 1.238682083
## [202,] 0.495393766 0.9734608684 0.638920683 1.000752102 0.442474803
## [203,] 0.880363878 -0.0822821504 0.458857462 0.219665877 0.438818103

```

```

## [204,] 2.418098439 3.5414167129 0.425952403 -0.088706537 0.675505257
## [205,] 0.889975869 2.2231344535 2.446493728 0.352454495 0.682181664
## [206,] 1.906041161 1.2526402919 0.915182712 1.835265724 2.400105083
## [207,] 1.935426862 1.0872653577 0.887135700 1.734587862 0.227909603
## [208,] 1.250047146 0.3861782018 1.353400681 1.823536948 1.026331446
## [209,] 0.981660339 1.1850226975 1.14464899676 0.912436182 1.247954898 0.553953949
## [210,] 0.919848189 1.1464899676 0.912436182 1.247954898 1.081089217
## [211,] 0.648109785 1.4388087837 0.321182206 0.456687105 2.269526934
## [212,] 0.590280673 0.2934137239 1.571885503 0.460638720 1.082088181
## [213,] 1.894064336 1.9277654472 0.217119690 0.458813113 0.317162482
## [214,] 0.240683493 0.4700832266 0.692487020 1.437600471 1.256279622
## [215,] 0.937801299 1.1606229015 1.855950211 0.866157002 1.461803190
## [216,] 1.743891223 2.5229883664 1.098185325 0.474935182 0.741236589
## [217,] 1.764291550 1.6164901505 1.084749733 1.472194673 0.322457511
## [218,] 1.140879618 0.8203869346 0.364035130 0.411854842 -0.064629189
## [219,] 0.987983633 0.5243871015 1.582322268 1.678606772 1.516558461
## [220,] 0.616610222 0.9494098307 2.566116875 1.177760113 0.930490638
## [221,] 0.655845093 0.5297716349 3.029785227 0.377933755 0.156451013
## [222,] 2.016207468 0.0500355498 2.754410000 2.510099393 0.594225835
## [223,] 0.881756783 1.7975713635 0.710073960 0.783487966 0.464011355
## [224,] 0.122632225 0.2203510563 1.040641401 2.120829329 0.957821096
## [225,] 2.487719917 1.3814545614 2.243818562 1.937639062 0.711291276
## [226,] 0.234140240 1.2278701261 0.778021047 1.064802494 1.306799253
## [227,] 0.666885283 1.0179421998 1.055721898 1.857524463 1.828775124
## [228,] 0.848387024 0.9035724460 0.617888112 0.558767327 2.027653010
## [229,] 0.327080686 1.1601498922 1.175977390 1.507681321 0.867184065
## [230,] 0.480291410 1.3448660543 1.128453949 0.533314227 0.899684758
## [231,] 1.451963604 2.3079531763 1.953568610 0.886594159 2.631959310
## [232,] 1.055660394 0.8181425253 0.467661586 1.148886101 1.417450292
## [233,] 0.554601435 1.5430342890 1.817275326 0.971453245 0.267041580
## [234,] 0.313671212 1.2241282511 0.530484329 0.444791960 1.997349828
## [235,] 0.676962184 2.9038573135 0.557327752 0.323069330 1.847304398
## [236,] 0.775872213 0.5595354435 1.015831401 1.339509045 1.888096205
## [237,] 2.683789103 1.6143333718 0.913315805 2.602982436 2.901541256
## [238,] 5.168886273 1.8225850785 -0.083909728 1.580258197 1.019693344
## [239,] 1.079689375 2.1322917760 1.552249184 2.236930773 0.463331750
## [240,] -0.051683278 0.5696128800 0.859755440 1.081222552 0.459041577
## [241,] 1.270830946 2.4180991942 0.881911395 0.757999242 0.342406819
## [242,] 1.180281907 0.6091671882 1.092809524 1.203066250 2.253003956
## [243,] 0.969426589 0.8758889271 0.899797316 1.005769617 5.797237050
## [244,] 0.959350441 0.8851341553 0.974776069 0.352168344 0.293535664
## [245,] 0.488246492 1.2153550199 0.809137395 1.257587156 0.766034281
## [246,] 0.072023154 1.4613721567 0.464542674 0.179313536 0.495084323
## [247,] 1.047392038 0.4702884000 0.847665490 1.012207713 0.623891065
## [248,] 0.274279387 1.5161859947 0.752840185 0.224315311 1.535679010
## [249,] 0.560979688 1.8536989409 0.790015768 0.602576820 0.477461241
## [250,] 0.787476748 2.6851767498 0.600064717 0.732606720 0.709621919
## [251,] 1.481416084 0.8037571273 0.371761189 0.429774230 1.318613689
## [252,] 1.376396017 1.2835104137 1.242917063 0.719419482 1.867359031
## [253,] 1.560423949 0.3854630077 0.486333643 1.858692573 0.888085247
## [254,] 1.138471830 0.6801898024 0.251036953 0.893013960 0.835083120
## [255,] 1.136554671 1.3520196254 0.854814026 0.878707415 0.188631906
## [256,] 1.612467198 1.3204729340 0.622753712 0.406651347 2.132522032
## [257,] 1.239707899 0.3336926895 0.650031284 0.279344005 0.260210860

```

```

## [258,] 0.708401596 2.4904505601 0.709870664 1.096722821 0.321081687
## [259,] 0.662164347 0.1407417893 2.002011575 1.591935203 0.119202114
## [260,] 0.456854642 0.5437402720 1.678689321 1.025800388 1.206641178
## [261,] 1.385134921 1.2504546979 2.133367407 1.127336345 1.618962195
## [262,] 2.159593724 1.2982086640 2.330066992 2.846186632 1.341741268
## [263,] 2.131621107 2.6391607780 0.756539506 1.287564214 1.110077961
## [264,] 0.485083809 1.6113786240 1.181302541 1.447230077 0.666979130
## [265,] 1.899388958 1.1434507901 0.265109736 1.368008900 0.866880758
## [266,] 1.279440998 0.4775137433 0.612716046 1.450981119 1.029806189
## [267,] 1.101391061 1.5695383240 0.474715489 1.311552870 0.391795324
## [268,] 1.511640403 0.8627183208 2.346491866 1.664775819 2.259074375
## [269,] 1.964202260 0.3616817708 0.233918984 0.537537850 0.740443583
## [270,] 0.847321312 0.5964263102 1.590080266 1.013969793 0.648992107
## [271,] 0.902747450 0.7922606150 0.424549447 1.213242619 0.966593548
## [272,] 2.047780022 0.6255554400 0.402817458 1.309277133 0.594215092
## [273,] 5.069158078 0.9620487775 0.922692927 1.678702578 1.300874868
## [274,] 2.033529959 0.5476827731 1.227290667 0.224426279 0.938831485
## [275,] 2.298836415 0.9254524147 0.912560075 2.053573834 0.596503885
## [276,] 1.152984113 1.0696888601 0.380203874 1.210180439 1.186740277
## [277,] 0.265919383 1.2091911705 2.133551386 1.226792771 0.183701358
## [278,] 2.276801254 0.8135514836 0.775511735 1.069929973 0.769396873
## [279,] 0.197581194 1.2962840361 0.887221159 1.691291287 0.705545602
## [280,] 0.372810390 0.8870860716 1.352284150 0.931920557 0.295695098
## [281,] 0.927829478 0.1643523933 1.914061743 0.343258093 0.809401544
## [282,] 0.361651334 0.7367138974 0.896520703 0.666638388 0.547710870
## [283,] 0.776431624 0.8724001247 2.384933336 0.982304011 1.046391066
## [284,] 2.045255010 0.7576543060 1.877402895 0.409478721 0.418611335
## [285,] 0.826842040 1.9982587291 0.667564860 0.443086710 2.511263619
## [286,] 0.937733009 1.8928017471 0.276138631 1.572540345 0.393701465
## [287,] 0.340580594 0.1399766725 0.195313906 1.077269887 1.215408601
## [288,] 0.733244268 1.7885617192 0.674671957 0.448769111 0.763520165
## [289,] 1.176421990 0.3402363120 1.460109987 0.678758559 2.558409274
## [290,] 0.626692812 1.1216046918 0.943661708 0.406160770 1.511855956
## [291,] 1.130492488 1.1997940335 0.138096577 0.567077636 0.231731853
## [292,] 1.524121639 2.4362199244 1.045993834 -0.002915711 0.759028878
## [293,] 1.077948162 0.0498907539 0.268391529 0.534249800 0.153552004
## [294,] 0.119819106 0.8987717438 1.710492617 0.361478452 0.162717483
## [295,] 0.456297084 0.2252201946 0.582565763 1.151137158 0.270154315
## [296,] 0.771806608 0.6152017126 0.867218170 0.324665334 0.358659590
## [297,] 0.943416488 0.3578154817 1.330319251 0.771207737 0.748616969
## [298,] 0.904306818 1.5043175066 0.823681790 0.581983985 1.373224241
## [299,] 0.260644801 2.1258940218 0.195345891 1.245855302 1.230825530
## [300,] 0.829676261 2.4525267916 0.695201124 1.809315294 0.879519662
## [301,] 0.644181302 0.4186122351 0.369887939 0.971592854 1.210982043
## [302,] 1.158472997 3.5454203468 0.551909472 1.749282608 2.457474309
## [303,] 0.008594992 0.4305329681 0.504128787 1.441018010 0.567770167
## [304,] 1.017093823 1.9252378556 1.276606115 1.172838449 1.044941184
## [305,] 1.391992002 1.0394716010 1.511576752 1.219488760 0.829245638
## [306,] 0.398362665 0.3759266178 0.999793731 0.927313390 0.584275839
## [307,] -0.001992293 0.8968675149 0.225334812 0.507805894 0.603322031
## [308,] 0.775923565 0.3301535965 0.358479390 0.198681180 0.698661318
## [309,] -0.214168060 1.6938945324 1.140043117 2.144441221 0.576050762
## [310,] 1.478957564 1.2466224295 1.731823165 1.590573674 1.521996314
## [311,] 1.541138166 0.2188437714 0.607782688 0.814540896 0.937494662

```

```

## [312,] 0.077666248 0.5431571539 0.148175379 1.062554697 0.267560209
## [313,] 0.007752042 0.4716097048 0.339497007 0.432328704 0.257572527
## [314,] 2.526041088 1.8535299062 0.740486488 2.470633917 0.224201055
## [315,] 1.012638455 2.4168030893 0.320935268 0.728345317 1.693095959
## [316,] 1.327403199 1.9417665493 0.615211212 1.756108452 0.725957489
## [317,] 0.079387036 3.0968625752 1.607739665 0.498293348 0.766826836
## [318,] 2.814612670 0.7714151808 0.600096049 2.140928151 3.666225099
## [319,] 0.117080215 0.6554726372 -0.293763138 1.523415631 0.665820900
## [320,] 1.293377849 0.9868741475 1.265902738 0.510448887 1.903296195
## [321,] 0.732291041 0.8735144668 0.777826138 0.182326676 0.248574377
## [322,] 1.562436378 0.7076201039 1.006153696 1.201771876 1.026414452
## [323,] 0.626839888 0.8050240994 0.285923889 2.328519460 1.355829288
## [324,] 1.854128053 2.1882266634 0.485417309 0.412155180 0.112987294
## [325,] 1.718877201 0.2080655669 0.470621536 0.528230147 0.292965663
## [326,] 0.757682959 2.6411386566 0.575255042 0.626055045 1.353402136
## [327,] 1.431738493 0.0647425215 1.106919830 0.552512144 3.820876257
## [328,] 0.178666051 1.0855995807 0.785143767 2.188725663 0.618171521
## [329,] 1.589985952 0.9839288486 1.435824694 0.367723006 0.999677517
## [330,] 1.955980121 1.1482920837 3.897520435 0.894618567 0.965464039
## [331,] 0.528789432 0.3637488394 0.066305653 0.762571638 1.896750753
## [332,] 1.403417248 0.7181392772 0.562978370 0.532895885 0.190822237
## [333,] 1.754150085 1.8341807452 1.305701558 0.683935562 0.606528059
## [334,] 0.964671381 0.4136869575 1.077720844 2.202358943 0.182697584
## [335,] 1.482117231 -0.0026049085 2.383385962 0.449692091 0.652186405
## [336,] 0.844634574 0.0800391841 0.325437888 0.148162068 0.131739175
## [337,] 2.044984349 0.7832654757 0.294419062 1.302622810 1.340736807
## [338,] 0.894694566 0.8306917642 2.764080612 0.736615862 1.163710381
## [339,] 1.807870554 1.2580861444 1.035075248 2.321984191 1.906723602
## [340,] 0.734998985 1.9399832698 0.811047286 0.636302230 0.570770280
## [341,] 1.200285801 1.0105513824 1.444513133 0.720257955 0.244884143
## [342,] 1.628053999 0.6345274051 1.146106618 0.683450845 -0.074745900
## [343,] 0.914350490 0.5997173312 0.664549246 0.186538728 2.535515251
## [344,] 2.821391331 1.6924837057 0.298049246 0.562631145 1.055339093
## [345,] 0.701750269 1.7230437456 0.904843600 3.915055336 1.564293092
## [346,] 0.878610234 1.3861269280 0.835870116 0.739685236 0.979679028
## [347,] 0.890828516 0.6292768533 1.025599583 1.266536685 0.749309804
## [348,] 2.144226547 0.5811541455 1.093749075 1.688513766 1.847129530
## [349,] 1.123434948 0.6234011058 0.811378012 0.602184710 0.066027426
## [350,] 0.587110703 0.2827821558 0.282879324 3.783430625 0.204523762
## [351,] 0.629687302 1.1453045032 1.829804300 1.548176139 0.693134514
## [352,] 0.653912433 0.6433419953 1.725323146 1.225585847 1.647543138
## [353,] 0.561301789 0.7701322542 1.969760889 1.669326862 0.589466597
## [354,] 2.898200920 4.1560707227 0.859957891 0.287662639 0.398855553
## [355,] 1.670747065 0.9928442992 1.525826230 1.862387966 1.356421860
## [356,] 1.068399831 0.8252528116 0.496593819 0.249599181 0.530019014
## [357,] 0.931061802 1.7951561139 1.306514975 3.379866303 1.391461835
## [358,] 0.780404657 0.3546300573 0.742188410 1.542556149 1.162412550
## [359,] 2.048288593 1.1103315409 0.670701055 2.098077633 0.406133558
## [360,] 0.522190420 -0.0562540531 1.068582454 1.555011247 1.086912655
## [361,] 2.476639253 0.6481349781 0.452144787 0.466497719 0.639317500
## [362,] 1.095270514 0.7149994558 0.751975426 0.821461161 0.489342924
## [363,] 1.287439400 1.5540419406 0.240227019 1.036842019 0.441132689
## [364,] 0.295347635 1.6782775526 0.339868323 0.726188996 1.142356547
## [365,] 0.218199721 2.3259708077 1.226731685 0.977808768 2.157295133

```

```

## [366,] 4.702170633 3.4832460109 3.406743027 1.458185979 1.026363030
## [367,] 0.020953576 0.4817776712 1.345282289 2.078502739 0.593011327
## [368,] 0.791607431 2.7532877833 1.760505689 1.513174148 1.579213573
## [369,] 0.374123287 2.9390176225 0.353372885 0.649517185 0.452529436
## [370,] 1.018513936 1.1311573648 0.453299749 0.126744878 1.329837362
## [371,] 0.580320306 1.7516047543 0.626671546 0.537374503 0.809768373
## [372,] 0.597717076 0.6797883130 0.432845267 0.028574721 0.350450669
## [373,] 0.365293745 0.5625517928 0.680035035 1.499831017 2.143587298
## [374,] 1.034117963 0.7950097542 0.278505887 1.260701796 1.006337858
## [375,] 0.873680028 0.1940958928 0.666203004 0.788890181 0.216823527
## [376,] -0.048685075 0.3038400100 0.977075544 1.126280091 0.121817445
## [377,] 0.986342941 2.0617368957 2.764201740 1.759545622 0.121871580
## [378,] 0.659695893 1.5170385305 1.617246678 0.265653076 0.557351044
## [379,] 1.881659464 0.8535159170 0.480766954 2.251161311 1.411355461
## [380,] 0.352725032 1.0981751410 0.521236821 1.168137677 1.927648004
## [381,] 1.283362148 0.9517328146 0.759307208 0.498240144 0.077065017
## [382,] 0.930964168 1.2737716525 0.479958820 0.800011763 1.308779277
## [383,] 0.989476181 1.9843131920 1.745668594 2.047434531 1.129419374
## [384,] 0.966956261 0.1790996165 0.108446499 2.052797753 1.207900593
## [385,] 0.753130330 0.4640889303 0.391915682 0.442653483 0.068463616
## [386,] 1.993482105 0.0572242405 0.355238691 1.727961932 0.598728255
## [387,] 2.055959937 0.5996905019 2.133817491 0.166788519 0.616706894
## [388,] 0.559062866 3.0342066136 0.771440284 0.685844371 3.130459208
## [389,] 0.340087715 0.9318067542 1.284628123 3.301758743 1.837977816
## [390,] 0.133741845 0.4902549891 0.993997619 0.632284633 1.944422367
## [391,] 0.455383297 2.1011480296 0.958293074 1.130524404 0.923039200
## [392,] 0.884475307 0.6554007972 1.212029000 0.857231740 0.713630101
## [393,] 1.248071743 0.3257247123 0.911892989 0.213797135 0.360843528
## [394,] 0.830807172 0.5549253216 0.440170594 1.701385544 0.476375012
## [395,] 0.734577194 0.1403152209 0.746952824 0.482032489 1.926270085
## [396,] 0.543979023 1.0489582221 0.998504795 2.101798177 1.027141515
## [397,] 1.700752494 0.7087206493 0.289303842 0.084021834 0.415086075
## [398,] 0.937365879 1.7837507919 1.250257113 1.201037734 2.975944687
## [399,] 1.064900404 0.2080725042 0.540869147 0.979734876 0.065243302
## [400,] 1.125001244 0.6530759445 1.229907368 1.058282368 0.837659949
## [401,] 1.598048464 1.1856358146 0.203680547 4.387277453 1.631054681
## [402,] 2.578212176 1.1620578851 1.091059535 0.699226056 1.611946968
## [403,] 0.679320763 0.6284174615 0.604264031 2.438914915 2.612751422
## [404,] 1.552320062 2.4817520391 0.423167322 1.430677380 0.288289561
## [405,] 0.665716021 0.2461961245 1.621091326 0.571938505 0.678129926
## [406,] 0.493137365 0.2433392116 1.893308404 1.453543317 0.703705915
## [407,] 0.558102874 2.5053261817 0.882520056 0.893669329 1.905289682
## [408,] 0.275861623 0.5247474447 0.869677063 0.270504656 1.350779303
## [409,] -0.016256968 0.1029896574 1.585216899 1.010680523 1.050439629
## [410,] 3.401781444 0.6523924631 0.921701185 0.822620595 1.515754142
## [411,] 0.155447779 0.8010882416 0.382933943 0.268180543 0.719909028
## [412,] 0.568738346 1.3276016315 -0.046143053 1.078215395 0.630192396
## [413,] 1.022204571 0.6420007957 0.502013743 0.924449637 0.043270839
## [414,] 1.555299766 4.1746600682 0.837630106 0.746404005 0.707197340
## [415,] 0.815157575 0.3198414585 0.318830077 1.810424125 1.382061790
## [416,] 2.069702569 0.4746576689 0.883590959 0.414213500 1.726050880
## [417,] 1.381988770 0.5017626842 0.397650070 0.299923437 0.803369212
## [418,] 0.765861939 1.3553015362 0.342714429 1.914548456 1.765770533
## [419,] 0.605752060 0.4039174571 0.261665630 0.225206666 0.960462648

```

```

## [420,] 2.339302601 0.4157794669 1.479416489 0.587512085 2.056054273
## [421,] 0.025830666 1.7582822720 0.396354767 0.924668644 2.306880042
## [422,] 0.648364157 0.6177965015 1.131054205 0.313219026 0.097468302
## [423,] 1.572118447 0.9677154245 0.058863848 0.880159422 1.132159842
## [424,] 0.170622975 0.4393573729 0.715379512 0.198357911 0.476741272
## [425,] 0.928847640 1.9398738850 0.309717922 0.694103806 0.306042126
## [426,] 1.431173722 1.6756304185 2.175950739 0.875375885 0.931353541
## [427,] 0.693504224 1.9399215419 0.195434303 0.633487380 0.097578670
## [428,] 1.686360618 0.2298855624 0.140230553 0.908631108 1.565289661
## [429,] 1.248685090 1.2081049737 0.166192271 1.525636218 1.884656884
## [430,] 1.737496648 0.6757941026 1.628322730 1.186821148 0.128217336
## [431,] 3.132540953 0.9668563200 0.891017169 1.961136158 0.931962998
## [432,] 0.693511177 1.3573163786 2.569733379 1.358941728 0.782282355
## [433,] 2.643264621 1.1385491199 1.051290464 1.372879771 1.996476630
## [434,] 1.671304573 1.6601259520 0.694599091 1.408778790 1.366686096
## [435,] 0.582694490 0.4973427401 1.109781242 2.240612989 0.851048409
## [436,] 0.692233032 0.4614534113 0.977097750 0.313760405 0.553394780
## [437,] 0.173457055 1.0869783898 0.814741971 0.914450593 0.350054856
## [438,] 0.786456254 1.0350996848 0.181864794 2.389792617 1.050621550
## [439,] 0.308014346 1.8549492739 0.613417549 1.001362191 0.271838414
## [440,] 0.593492788 1.8163687803 0.179965844 0.990240617 1.113914335
## [441,] 1.063519681 1.3688487443 0.717096212 0.970480616 0.897866681
## [442,] 0.024414566 0.3552318821 0.176992391 1.100145407 2.097843487
## [443,] 0.740346834 0.6284431277 2.219793774 0.546314387 0.105987342
## [444,] 0.201678631 1.6166288527 0.416926741 1.039692247 2.050092845
## [445,] 0.911401268 0.1094196089 0.236700118 1.400290586 0.503562166
## [446,] 2.073448475 2.2451034708 1.764068352 1.252194789 0.819199575
## [447,] 0.758379867 0.9586720105 1.874461057 0.943571505 0.379164589
## [448,] 0.565244741 1.5027801168 0.489834574 0.463099133 1.694533794
## [449,] 1.699208788 0.8274630850 1.074074725 0.731790934 0.599647019
## [450,] 0.595832639 1.8164481428 1.372272708 0.887175051 0.695505668
## [451,] 1.680986371 0.0868519899 0.601647823 0.183978080 1.176550045
## [452,] 0.768021017 0.3920287826 0.560275830 0.113129126 0.408766133
## [453,] 0.802456826 1.3145213302 0.057071031 0.659991855 0.910716186
## [454,] 0.814139861 0.7423123627 1.148942221 0.506242688 1.125121963
## [455,] 1.222706477 1.0042282242 0.315343282 1.118270040 0.814514109
## [456,] 1.701616448 1.3108631154 0.376914136 0.599389734 1.043593588
## [457,] 0.886276423 2.1130133463 0.781576934 0.160979949 1.171760205
## [458,] 1.050910919 2.9545952977 0.612676295 1.476648861 0.289544741
## [459,] 1.522048816 1.4727898603 1.027540909 1.296206364 0.743883145
## [460,] 0.259882622 0.6050804913 1.078975274 0.844228997 1.579084810
## [461,] 1.702149694 2.1959710605 0.317660271 1.064099582 0.460783737
## [462,] 1.400865012 2.3788532177 0.864446622 0.675383249 0.990767061
## [463,] 0.207790400 0.7805028766 0.999194903 1.013304992 0.632697090
## [464,] 0.307858246 0.2613791099 0.793357990 2.043818628 0.604360682
## [465,] 4.202194611 2.8578072131 0.628436428 0.718934034 1.661184523
## [466,] -0.012651320 1.3330685650 0.922792047 0.134011608 1.079614971
## [467,] 0.660898949 1.0814747426 0.317130586 1.526553554 1.275894210
## [468,] 2.101076722 1.8124321270 0.007076953 0.768029333 1.448952533
## [469,] 0.225294408 0.9739675198 0.718530566 -0.049530051 3.655588482
## [470,] 0.399932060 0.1895430152 0.136435622 0.506549317 -0.080489644
## [471,] 0.386027660 1.0118933602 1.699907836 1.318072059 0.861862922
## [472,] 0.549774780 0.2912767302 1.400938713 2.310303341 0.947360393
## [473,] 0.904588578 0.6530202303 0.971151879 0.628662061 0.243098717

```

```

## [474,] 1.025992245 -0.0534099340 2.101824256 1.457889258 0.442309704
## [475,] 0.515385989 0.5829787983 1.505226094 0.812181061 1.003773084
## [476,] 0.808611491 0.1738232927 0.826763155 0.191009736 0.961103995
## [477,] 1.664092418 0.3480634930 1.416027080 1.578445162 0.773080454
## [478,] 0.387613943 2.7328071269 1.219941891 0.766353769 2.232683641
## [479,] 0.403557717 1.0143607249 1.812631571 0.421749475 -0.008512159
## [480,] 0.399138232 0.5711578062 1.438134485 0.904064152 1.369662768
## [481,] 0.910241490 0.9319101053 4.494870994 0.303086836 1.930103209
## [482,] 1.068253259 0.1717878812 1.105960407 0.283926457 1.307591083
## [483,] 0.679163169 2.1750602769 0.441673641 0.486991922 0.423067872
## [484,] 0.764247821 0.5531011079 2.297969549 2.421473125 1.148432123
## [485,] 0.204092076 1.2132799870 0.546757869 1.141119703 0.875604910
## [486,] 0.937628533 2.2396349255 0.433847719 0.088520517 0.544461205
## [487,] 0.376566538 0.7590117544 0.498885666 1.545021393 0.330829249
## [488,] 0.212952969 0.2347674317 1.012497400 0.134241949 0.295140359
## [489,] 0.287411058 1.1296226100 1.156009522 1.000920799 0.586971242
## [490,] 1.807149103 1.1714859470 0.913441978 1.749419599 -0.048943511
## [491,] 0.861003646 1.0964689502 0.872028460 0.533348496 1.564957399
## [492,] 1.031464146 0.3834393191 0.284115689 1.183637211 0.509750240
## [493,] 1.090889126 1.3662195734 0.994292003 0.268025587 0.198240128
## [494,] 1.348255555 2.2139684102 1.149108514 0.862464171 1.527908692
## [495,] 0.126299120 0.6258599899 0.381927983 0.517285350 0.448627700
## [496,] 1.411667506 1.1287064475 2.469651855 1.229942924 1.891843580
## [497,] 0.116263772 1.2151117275 2.045052249 1.361602299 0.729815538
## [498,] 0.632780442 0.6588337417 1.046445675 1.442198416 0.668817436
## [499,] 0.366734011 1.8224637728 0.727957316 0.812065154 0.589801475
## [500,] 0.709936771 0.7014764100 0.138518883 0.814846367 1.411051306
## [501,] 0.916904470 0.4178633333 1.734379363 0.017852272 0.668711766
## [502,] 0.723800735 1.5999141424 1.090527999 0.905070523 0.625024081
## [503,] 1.065800196 0.6915258280 0.667678845 1.564318761 0.703516589
## [504,] 0.064321436 0.5932409149 1.344452768 1.299580597 1.738826669
## [505,] 0.694631188 0.2038303408 0.843640855 1.310001639 0.771858591
## [506,] 2.546396588 1.0574256767 0.314667730 1.782700916 0.189681019
## [507,] 0.114812437 0.8281952258 1.027729541 0.210524487 0.037068558
## [508,] 1.088666015 1.1846246466 0.652605451 1.656207587 -0.066586484
## [509,] 1.285391454 0.2536785898 1.519014119 0.722186708 -0.034742328
## [510,] 0.342257476 0.5711215044 0.222364440 0.246572511 0.801836831
## [511,] 0.638843671 0.3476743499 0.692606116 0.765939281 -0.045255876
## [512,] 0.724268015 0.3991022914 0.800302368 0.157940539 0.485725831
## [513,] 0.679675909 0.8310625022 0.841357171 0.651952908 1.399991643
## [514,] 1.552063851 0.8963613728 1.293658221 0.902959611 2.518917225
## [515,] 1.041916296 0.1699607944 0.280847579 0.577288470 0.623610740
## [516,] 1.045352737 0.4490152766 0.411382828 0.628582430 2.198928013
## [517,] 0.911789473 0.6255595591 1.467542226 0.743478489 0.903824961
## [518,] 2.505119263 0.5392082576 0.320436402 0.710032458 0.630838537
## [519,] 1.083596057 3.0666031200 2.739063512 4.625010253 1.482640908
## [520,] 0.450001602 3.2347106442 0.821828792 0.649689042 0.587864076
## [521,] 1.614988630 1.7774029784 0.348575901 1.533516082 3.217524203
## [522,] 0.855510481 0.5213748852 0.742745739 0.289275438 -0.278543299
## [523,] 1.195337049 0.2620442268 1.275995435 0.347051615 1.008162427
## [524,] 1.655405264 1.1927056173 2.543024367 1.473768715 0.770803431
## [525,] 1.773851321 1.1875014652 0.967714299 0.313146479 0.438124660
## [526,] 1.629432557 0.5506107743 0.495863187 0.324390169 0.069091211
## [527,] 1.017623176 0.7278409449 0.694700156 0.505309643 0.401204447

```

```

## [528,] 2.704612128 1.1733907094 0.850738240 1.866431145 2.251578152
## [529,] 0.215465681 3.3436148903 0.299346518 1.006488433 1.670968137
## [530,] 1.482294051 0.1817852888 0.799109276 0.019120361 1.006431206
## [531,] 1.929265379 2.0736747292 1.922538373 1.102790980 2.137798404
## [532,] 0.861172387 0.6523944112 0.756544445 0.875417390 0.974515308
## [533,] 0.460944739 1.2058856019 1.324717100 0.614350114 0.867524774
## [534,] 1.318115504 0.4217268418 1.812216316 0.800013663 1.216796618
## [535,] 0.528010184 1.2622092542 0.706185255 0.284783721 2.271088849
## [536,] 0.966044601 1.1759018365 1.583623083 1.880536400 0.730730649
## [537,] 0.835644579 0.2933993166 0.559302640 1.566538040 0.040277268
## [538,] 1.388469449 0.9698453439 2.240376307 0.489097248 1.539372339
## [539,] 1.309192495 0.6103612602 0.129273142 0.144175959 0.545373691
## [540,] 0.305096039 1.8685831846 0.561617035 0.848381158 0.257479905
## [541,] 0.581102059 0.4413109855 1.008349649 3.564037292 2.276997258
## [542,] 1.883958310 0.9117864425 0.820922748 1.901706483 2.478404666
## [543,] 0.628896609 0.2882067960 0.725644307 0.878789765 0.790813226
## [544,] 1.214118472 0.5780127921 0.070509702 0.904882514 0.642208755
## [545,] 0.538787948 1.5221474179 0.914206683 2.017039133 2.028398915
## [546,] 0.286770627 0.5887346540 0.775498895 0.570250206 1.525772205
## [547,] 0.739523931 0.7788314649 0.697953149 0.780915083 0.734261731
## [548,] 0.683681928 0.4850192920 0.546118803 1.013844734 1.949728949
## [549,] 0.362569975 0.5249877561 1.022779229 0.560580767 0.990792067
## [550,] 0.856521631 1.5778047407 0.663959092 0.691012415 1.510857780
## [551,] 0.464576190 0.2351620689 0.005068373 1.235573786 1.312782618
## [552,] 0.502052077 0.5983090688 1.842889632 0.498997535 0.174113639
## [553,] 0.371431909 1.0452634521 0.646167901 1.261752225 0.814139931
## [554,] 0.247530319 0.4178069221 1.781815767 0.229923638 1.708102976
## [555,] 1.811165500 1.9901356717 0.358855511 3.425840160 0.520928287
## [556,] 0.592362342 0.9059266408 -0.016754106 0.760022377 0.594701337
## [557,] 0.351066958 1.4891392893 0.805777425 0.433794260 0.282519199
## [558,] 1.047801549 1.4758899069 1.390299225 1.078594981 0.852777526
## [559,] 0.471881471 0.8313929782 0.315314605 0.931199114 0.631546264
## [560,] 0.837684381 2.2115202493 1.001346131 1.182690605 -0.131338590
## [561,] 0.607508275 1.3963653034 2.801604061 0.169085319 0.303222458
## [562,] 0.570837114 0.5866303558 0.252311690 1.172617118 -0.099834223
## [563,] 0.300540998 1.4346561650 1.733271278 1.701273929 0.853031003
## [564,] 0.329507603 0.3467444563 0.281380512 1.428035883 0.425550591
## [565,] 0.337617763 3.0496040348 0.070152725 1.917516287 0.495908190
## [566,] 0.637208614 0.1763203800 0.505917330 1.199728578 0.029592597
## [567,] 1.394670378 0.6927455668 0.256325154 1.741079833 0.921616835
## [568,] 0.045181569 1.3784485788 0.542068028 0.151233651 1.725377128
## [569,] 0.968825388 0.5388580990 0.401673317 2.080384857 0.632313099
## [570,] 1.833978444 0.6900303425 1.352957970 0.409084610 0.681810610
## [571,] 0.633768274 0.4140059141 0.474169164 0.823529761 4.789093204
## [572,] 1.282540031 0.3500260350 0.260944858 0.381340361 0.769669400
## [573,] 0.899202192 0.3949875092 1.396248780 1.051961049 0.958180684
## [574,] 0.122203744 0.8584470791 0.792653530 0.351489763 1.701807289
## [575,] 0.281857268 0.2742980316 0.165016148 1.251551778 1.083385158
## [576,] 0.925391026 0.8445970077 0.547052681 1.973818199 2.480917169
## [577,] 1.596037371 0.5178852519 0.439846550 1.109963731 0.011284229
## [578,] 2.049056933 0.2071501283 1.054272666 1.088434721 0.801922864
## [579,] 1.659661899 0.3387035749 1.241375943 1.504415472 1.637627853
## [580,] 0.915397850 2.2136602362 0.301209153 0.765561739 0.819220754
## [581,] 1.146785679 1.5522672646 0.644320066 0.533540809 0.304167238

```

```

## [582,] 0.543927876 0.5110653873 1.078301614 1.854016898 0.758183239
## [583,] 1.427848174 0.9989848557 1.560219681 1.656515871 0.598314189
## [584,] 1.115925497 1.1363297843 0.468782801 1.396637872 0.400802176
## [585,] 1.036617165 2.0071776271 0.148982974 0.030878252 0.951993373
## [586,] 0.395829276 0.9064887975 0.544168652 1.164083067 1.185851536
## [587,] 1.291753334 0.7874054289 0.175767063 0.755624874 1.587985238
## [588,] 1.058867941 2.4099207068 1.117336253 2.173676763 1.173620461
## [589,] 0.089693683 0.5918240090 0.442604825 1.129924720 0.169274477
## [590,] 0.824105928 0.6944884076 1.188154246 1.273088135 0.941814910
## [591,] 0.782231215 0.6203866424 2.336572413 2.284281447 1.161111385
## [592,] 4.154062295 2.5982591557 0.957085167 1.445105554 1.941034287
## [593,] 0.440637599 0.5751688469 0.968128484 0.978857433 0.360028601
## [594,] 0.855117160 1.9720157144 0.841973311 2.593293232 0.732142781
## [595,] 0.611238371 0.2748566342 0.470238782 0.515738534 0.435051978
## [596,] 0.460340715 1.4535826356 1.568794333 2.071124156 1.744567769
## [597,] 1.643159503 1.0441821842 0.399470195 1.091152271 2.193092773
## [598,] 1.699384336 0.9684990812 0.679231006 1.181205276 0.410303036
## [599,] 0.317999365 0.8897722996 0.707499026 5.382747494 0.595388641
## [600,] 0.295842146 0.3632152094 0.050093335 0.785469597 1.170887461
## [601,] 0.653679330 0.1017740580 2.415508135 1.106481131 0.545365160
## [602,] 0.142596864 1.9971556703 0.258727130 0.784594581 1.544619352
## [603,] 1.481235792 1.0407728028 0.321081430 0.406510376 2.073700208
## [604,] 0.149977419 0.4995714892 0.506974827 1.198719694 0.090424675
## [605,] 1.188669050 2.6014405595 0.321340294 0.959759588 1.423170302
## [606,] 1.254088845 0.3574464615 1.190904586 0.666448583 3.252755812
## [607,] 0.185526804 0.3114589448 0.512566874 2.330772273 2.128089897
## [608,] 3.231870189 1.3580088870 0.945027744 0.448956449 0.619729017
## [609,] 1.053498341 1.3430813340 1.209554724 0.976916165 0.616405199
## [610,] 0.540398653 0.9779516946 1.463335890 0.651283905 1.333683800
## [611,] 1.025169132 0.7173142070 1.302425552 1.658033479 0.861558704
## [612,] 1.448872980 0.0676439798 2.602940813 2.538891782 0.727151674
## [613,] 2.681480327 0.7468654830 4.465488266 0.536043909 0.511490768
## [614,] 1.513802690 0.7151246705 1.351967732 0.857560139 1.729608528
## [615,] 3.752468224 1.0884608282 0.150718406 0.712079748 0.928656041
## [616,] 0.565078640 0.4576934670 0.479119146 0.860915692 1.310933948
## [617,] 1.026505710 1.1016644653 0.911725409 1.300486907 0.760179506
## [618,] 1.762698627 0.7606253355 1.239602930 0.500814758 2.396204085
## [619,] 0.474630947 0.8497053785 1.536738913 0.462588965 1.447686270
## [620,] 0.723086660 2.1179482177 0.663027505 1.880400509 1.599903109
## [621,] 0.744201553 0.5498277588 1.655610122 0.418212604 0.648489850
## [622,] 0.478447971 1.1597125377 0.380398242 1.679660557 0.882620597
## [623,] 1.227482594 0.7177923658 0.769350537 0.507255590 0.832461297
## [624,] 0.417832655 1.1400151729 0.952837355 1.001185401 0.378791801
## [625,] 0.456647563 0.2938598095 0.581330626 2.133047750 0.622982183
## [626,] 1.967597503 0.9127063216 1.280836335 0.500994792 0.394644188
## [627,] 0.708138870 1.3693282234 2.726370064 1.468742538 1.512786315
## [628,] 0.653526318 -0.0175248156 0.791656704 0.141067785 0.763640709
## [629,] 2.505148928 1.9757648281 1.850985655 0.758249779 1.306594529
## [630,] 0.835623550 0.8204369056 1.255720731 1.476745530 0.635558337
## [631,] 1.447039952 0.6199228485 -0.091903998 1.466676602 0.842118849
## [632,] 0.923178708 1.0073171532 0.379066080 0.620153083 0.803258482
## [633,] 0.822612607 0.7369930529 2.114034492 2.064749764 0.586748044
## [634,] 1.124242517 1.7000581639 1.431060147 0.924959807 2.160337481
## [635,] 1.716044744 1.6146519103 0.561001151 0.585922623 0.611582026

```

```

## [636,] 0.858354278 0.3830766372 1.809663107 0.400873847 0.697799190
## [637,] 0.485842072 -0.2562553036 1.283650768 1.023819578 0.628237082
## [638,] 0.628554737 0.8027928897 0.731659246 0.317503957 0.981535694
## [639,] 0.807258353 1.0316886983 0.860778130 0.001232920 0.195051820
## [640,] 0.585292781 1.1183990025 0.444169239 0.309841524 0.717658939
## [641,] 0.259168482 1.4303107242 1.193873984 0.454509030 1.428500679
## [642,] 0.548569951 1.9369285691 1.208949400 1.451592872 1.609813561
## [643,] 0.742906299 1.4513482036 1.235310166 0.573473534 0.424081510
## [644,] -0.013828153 0.4924993018 1.007235215 0.040343557 0.949295600
## [645,] 0.273409736 0.8051562369 1.129963272 1.344534492 0.151830041
## [646,] 2.025616625 0.4747195314 1.165570559 0.357789100 0.411936793
## [647,] 0.516290099 0.2146738131 -0.015288831 0.775791669 1.260579042
## [648,] 0.243463614 0.1711770738 0.441270274 2.441335975 2.358620153
## [649,] 1.574004263 0.7674070836 0.403616833 0.102208557 0.480440199
## [650,] 1.337054239 0.9447312358 0.996734604 0.534912463 0.341432230
## [651,] 3.087422701 0.2696904691 1.021322515 2.020437725 0.242807309
## [652,] 1.193326929 0.1719028635 1.473829312 0.542276976 0.099499501
## [653,] 0.460964769 0.8522994500 1.389933179 1.248133475 0.812873664
## [654,] 0.094687336 1.0905199678 0.690624703 0.089156184 1.402975515
## [655,] 1.460347237 0.5425591906 0.830703584 0.406910035 0.661788996
## [656,] 0.779096154 1.1294606910 0.408792708 0.699655083 0.080121077
## [657,] 1.244665625 1.4535058492 1.302099977 1.001276592 0.219792839
## [658,] 0.324250653 0.2446554715 0.632591007 0.950179738 1.343905935
## [659,] 1.756664774 1.7882277799 0.451538970 -0.074128810 0.827287214
## [660,] 0.466200371 0.5760463222 0.820042533 0.422030285 0.983812278
## [661,] 0.846241090 0.7614954543 0.664969892 1.246250640 0.415412571
## [662,] 0.292444009 1.0116992727 0.772440457 0.478914127 0.811476019
## [663,] 0.577393576 0.8128085145 0.227704483 4.367165894 1.378972083
## [664,] 3.149050062 0.5534284183 1.322420007 1.936150053 1.501866436
## [665,] 0.654741294 0.3414499068 1.737388789 0.614884208 0.740278298
## [666,] 2.053536890 0.7053734415 0.743057119 1.019050740 2.293110555
## [667,] 0.617578189 0.8469953719 0.705541813 2.561312125 1.781234485
## [668,] 0.647547801 1.2571323987 1.366831383 1.407409775 0.871263682
## [669,] 0.872681235 3.1129195555 1.038403540 2.884662461 1.420343459
## [670,] 1.103277229 2.0642107642 1.092006665 0.275492925 0.586639840
## [671,] 1.654668938 0.8875140789 0.982161490 0.831330531 1.148595729
## [672,] 0.255041228 0.6063363289 0.881237079 1.241528860 1.606756141
## [673,] 2.718936509 1.0334657275 0.349283606 0.994819217 1.455518797
## [674,] 0.979329034 1.6417083588 1.713677705 0.169102265 0.583424378
## [675,] 0.689327599 1.0296815462 0.927220322 0.155735543 1.341306689
## [676,] 1.379764095 1.3337804802 3.277470808 1.760964799 1.639009922
## [677,] 0.908940745 0.4654296274 0.076921700 0.965280174 1.299897145
## [678,] 0.029690422 0.9423607487 0.830922395 0.673191585 0.229830697
## [679,] 2.950045244 0.4224214601 0.437276709 0.447269127 0.460474776
## [680,] 1.147642495 0.6804944717 0.924962368 1.525094999 0.255239669
## [681,] 0.493607813 1.4116760402 1.218015373 2.194154427 0.925780804
## [682,] 1.978672806 0.5149890292 0.936776292 0.232613241 1.748809857
## [683,] 0.305152247 1.0369455392 0.738489005 1.496205491 1.073037095
## [684,] 1.587808843 0.7686869519 0.113284018 0.028823378 1.312919638
## [685,] 3.029467020 0.5670201979 3.379563615 0.085021853 1.528017661
## [686,] 1.356437584 0.8661457142 1.161460676 0.947516558 0.581646342
## [687,] 1.042922109 0.3729027100 2.470915021 0.721476147 0.439816442
## [688,] 0.589340815 1.1679634728 0.162701591 0.236228164 0.373711284
## [689,] 0.717304416 0.1936654885 0.406528591 2.173754041 0.638014608

```

```

## [690,] 2.567577957 0.8589429441 1.949586364 1.120060788 1.431458167
## [691,] 0.708249845 1.1668348430 1.283888945 0.794945814 1.223447098
## [692,] 0.954435398 0.2283002266 3.293552837 0.656985517 0.196176400
## [693,] 1.027621810 0.2114481261 0.149234020 1.471640933 0.254834292
## [694,] 1.601401019 0.3490407605 0.671135679 1.339811338 0.759056314
## [695,] 2.820287453 0.7199588566 3.126297364 0.602388577 3.297308902
## [696,] 1.139959542 1.6937566867 1.976801494 -0.102409200 1.561537174
## [697,] 0.792787547 0.3001206006 2.005525243 2.364813313 0.155171826
## [698,] 1.771626449 0.8063318640 1.587415776 0.783842436 0.325520842
## [699,] 0.930839458 1.9800870936 1.008397801 0.413417988 2.121957815
## [700,] 1.093383471 0.8693634905 1.885293874 0.575446820 0.571571725
## [701,] 0.487051717 0.7357189880 0.461190733 0.091847454 1.690507870
## [702,] 0.723844249 0.5246748541 0.366663903 1.170500475 1.334005331
## [703,] 1.492599596 1.2882649676 0.847715279 0.378198391 0.887392994
## [704,] 1.633517543 1.8352161974 0.480049281 1.873391444 0.708062419
## [705,] 0.506173759 2.8182256888 1.197335939 1.326972793 1.145595862
## [706,] 0.425581573 1.8303349409 0.317901025 1.579068473 0.519404642
## [707,] 3.868825485 1.3125020039 0.511946707 0.879384748 2.058785834
## [708,] 1.056029318 0.3046294957 0.660651631 3.323029918 0.860632695
## [709,] 1.094724848 0.0756581949 0.482920511 1.189474866 0.813783746
## [710,] 2.107485337 1.1892186701 2.881466555 0.567499909 0.271708649
## [711,] 1.182421545 3.6355790342 0.305147207 3.993040597 -0.037946460
## [712,] 1.684345807 1.4590551037 2.781905503 0.034703995 0.680497617
## [713,] 0.801201638 1.6493490549 1.410266289 1.396615702 0.202459846
## [714,] 0.083427069 0.1276667426 0.773457746 0.172380427 1.800035902
## [715,] 3.830662042 0.2918297119 0.581573333 0.449458746 1.371516147
## [716,] 2.403777963 0.6668705015 0.351775329 1.066156729 0.531032342
## [717,] 0.133852360 1.2020123589 0.620668820 1.179130148 0.757344621
## [718,] 1.656295229 1.1826486537 0.806345118 1.746891803 0.395641866
## [719,] 0.421872289 0.8071128350 1.024915312 0.163895016 1.394946867
## [720,] 0.751484910 2.2150165221 0.398246239 0.574471149 0.904909929
## [721,] 0.847621994 1.5742088375 0.628590626 0.773314265 0.915371668
## [722,] 0.294884066 1.8502633234 0.291256204 1.449236644 0.882138599
## [723,] 1.445766790 0.7951218831 0.638919487 0.997020912 0.618623538
## [724,] 2.495477792 1.8784493738 0.793618529 0.923044667 0.495037895
## [725,] 0.661822188 1.2674435295 3.198555902 1.508732954 0.743302601
## [726,] 1.322473424 0.1919672973 0.226108638 0.920611431 0.773550505
## [727,] 1.356559060 0.9873026286 0.119215440 1.143129252 -0.120063647
## [728,] 0.476171851 0.7846993373 2.539010601 0.384823597 0.144312005
## [729,] 0.835472321 0.8782819162 1.311660470 1.299662083 0.545795050
## [730,] 0.764232599 0.6262408904 0.336621424 1.909918185 1.115484675
## [731,] 1.098506192 1.9544607407 1.287983905 2.225293437 0.839343756
## [732,] 0.712595354 0.7748584119 0.113644070 0.790979621 0.595732281
## [733,] 0.514330369 0.4731190245 0.147511909 0.475086897 0.917215579
## [734,] 0.283196861 0.2389137918 0.292204141 0.559152660 -0.067954375
## [735,] 1.016532690 0.5662770881 0.676294254 2.410735043 2.468468491
## [736,] 0.500671951 0.7333637225 0.498026711 0.539394135 1.457507073
## [737,] 1.311557392 0.8627181746 0.110483059 2.174321262 0.410360805
## [738,] 1.555639443 0.5311692231 0.672703367 0.434690154 1.093622420
## [739,] 1.360061997 0.7693953791 1.274707960 0.241421113 0.730803643
## [740,] 0.910379371 0.4338996916 1.033482226 0.697435321 0.806591184
## [741,] 1.148802382 2.9969647337 1.163118176 0.446416776 6.080225195
## [742,] 0.216337192 1.0382733184 0.321608761 0.823805273 0.161831173
## [743,] 1.957727047 0.8388182331 0.298520458 0.131927807 0.577656066

```

```

## [744,] 1.449181546 -0.1807920870 0.180206908 0.718017815 0.328721344
## [745,] 0.511234144 0.2432741533 0.767302817 2.471356339 0.251628149
## [746,] 2.042076936 0.5197952771 2.678786755 1.427033815 0.634470545
## [747,] 0.319755824 1.1232754332 0.630564931 0.799069683 2.088479824
## [748,] 1.467445609 2.0627954119 0.507609949 0.345524599 0.733177691
## [749,] 0.607065988 0.7966332448 1.043143046 0.085414774 1.004822924
## [750,] 1.624412070 0.9761272048 0.463168294 0.856323817 0.320277922
## [751,] 0.495744796 1.8561312410 1.486692229 1.522686916 0.187829669
## [752,] 1.186337302 0.9923141249 0.605321054 1.520808097 1.942122158
## [753,] 0.621021464 1.4063164084 0.565491386 0.174005983 0.585777263
## [754,] 0.531931574 1.4778729758 1.099285184 0.629194378 -0.055663815
## [755,] 0.798456538 0.8915618305 0.677173646 0.378436912 0.403246349
## [756,] 0.961165354 1.1317181724 2.622289559 3.057902704 1.143384191
## [757,] 0.206176242 0.6183080592 2.167111287 1.217957907 0.490658720
## [758,] 0.747574096 0.8583838520 0.572979452 0.397026597 1.439310396
## [759,] 0.721499049 2.0909314864 0.607421178 0.801861513 0.390460010
## [760,] 1.245232325 0.7626518783 0.497597246 0.739353193 0.580375892
## [761,] 0.414686309 0.7064720613 0.687425334 1.515051348 0.468184998
## [762,] 0.729398767 1.2421111861 -0.100211207 1.450642811 1.351107671
## [763,] 0.384663909 0.5984459495 1.529187150 0.552442401 0.214097050
## [764,] 0.568672618 0.5385436792 1.065341347 1.560426454 0.295386863
## [765,] 0.807508921 0.9629548677 1.955709403 0.328197799 3.466423452
## [766,] 0.730743947 0.7785295220 0.218767416 0.341665561 0.613809382
## [767,] 0.368765761 0.3954274535 1.642677248 3.458568461 0.672777956
## [768,] 0.194889714 0.2689890969 1.040256030 0.121731229 1.552481218
## [769,] 0.333979696 0.6244741447 0.781324835 3.107205025 1.961133277
## [770,] 1.475661777 1.5253086328 0.510563728 0.158724677 0.596658986
## [771,] 0.316955247 1.0466321137 0.285359452 1.743182179 0.391807407
## [772,] 0.598718523 1.2169867354 0.710570961 0.325369074 0.511329429
## [773,] 0.342279381 0.6457361109 0.907814633 0.535633359 1.250102511
## [774,] 0.784930832 0.3243553292 1.310736232 0.731151023 1.680142242
## [775,] 0.902840861 1.0005043463 0.554729171 1.470743731 1.199170471
## [776,] 1.543447972 0.8492647678 1.170443553 0.165216510 0.995256313
## [777,] 0.316455904 1.3644461430 0.168082673 0.838656985 1.246041101
## [778,] -0.167297560 0.7690434722 1.789160899 1.038808750 0.179842761
## [779,] 0.035258112 0.2314678592 2.140491967 1.394550513 0.514147986
## [780,] 0.382752336 0.8545301940 2.866216781 1.494824556 0.119744024
## [781,] 0.751110698 0.4044390923 0.852722757 0.671719060 2.050477322
## [782,] 0.122963869 0.3090438253 0.024740442 0.416410843 1.460683028
## [783,] 0.662771189 0.3796155195 1.520832525 2.230079059 2.013567671
## [784,] 0.370670961 1.3017094343 1.181851126 2.170887270 1.979884674
## [785,] 0.980757068 1.4677379447 1.000010178 0.563772733 0.596060710
## [786,] 0.917614116 0.5788487066 0.383907534 0.501172847 0.417807489
## [787,] 0.949069584 0.2359524450 1.099281605 0.204382670 1.380449732
## [788,] 0.252972038 1.4107071386 1.083284127 1.210323862 0.489970036
## [789,] 1.747889896 0.4280834881 0.559156589 1.511878854 0.916596011
## [790,] 1.897994943 0.3952754454 1.288211252 0.473975363 1.030424025
## [791,] 1.843752822 1.2306278120 1.868816334 0.515927789 2.770255737
## [792,] 0.610551752 1.7807534617 1.825219769 0.681032571 0.551746712
## [793,] 0.912679986 0.7885834935 0.763905966 0.418338900 2.009013740
## [794,] 1.090683346 0.4341920774 0.498289008 -0.059539262 1.513106108
## [795,] 0.876288417 1.2386362689 0.567988641 1.909277306 0.936574350
## [796,] 0.510997638 2.3139461557 4.505866027 0.035745193 1.028898749
## [797,] 1.243048572 1.2078872207 1.627953093 0.740435689 1.834134193

```

```

## [798,] 0.902808585 2.5201947508 0.435823792 0.239930023 1.050681352
## [799,] 0.825818995 1.8815921662 0.891022049 1.048377539 0.368799558
## [800,] 0.284165058 0.1845568789 0.299856996 0.950867024 1.123077255
## [801,] 0.293830786 0.2094327330 0.803856954 0.567145142 0.396105827
## [802,] 0.950262517 0.1996929027 2.155356956 0.783588066 0.415410778
## [803,] 0.550116431 0.6965207108 0.746054850 0.844039315 0.831903310
## [804,] 0.623650814 0.2532608156 0.122315324 0.705214623 0.954932233
## [805,] 2.095374312 0.5498225740 1.188372262 0.747342696 4.190237911
## [806,] 1.366416060 0.5461175232 1.469760428 0.018259889 0.668759208
## [807,] 1.096030049 1.7334564086 1.108528164 1.256132289 1.173623190
## [808,] 0.354857773 0.6518181667 0.128268717 0.468453102 1.191486551
## [809,] 1.368652175 0.8412717675 0.720030758 0.609871392 1.057285567
## [810,] 1.037019966 0.5916953763 0.526942290 1.589568740 0.916921529
## [811,] 0.522888306 2.3911303988 1.997450029 0.910109395 1.185501774
## [812,] 0.288019057 0.9519680814 1.114721770 0.410030462 0.358324138
## [813,] 1.393729213 0.1900420761 0.447601911 0.782545606 0.841737983
## [814,] 0.576853412 1.8649147970 0.752311436 1.050962020 0.365866342
## [815,] 0.529301934 0.7061934379 0.507122825 0.299702651 1.167328474
## [816,] 1.368875018 1.0777909086 0.778210982 0.962661725 3.370215694
## [817,] 0.894350526 0.5777464848 0.724697742 0.388967719 0.440888782
## [818,] 0.980225500 1.2686829399 1.523578968 0.343200849 0.232733875
## [819,] 0.405352509 0.7577479953 0.425263447 1.208647739 1.003789181
## [820,] 0.684492752 0.8255423922 0.401571218 0.646466441 0.440599668
## [821,] 0.200339568 0.8740127786 0.792343376 0.553193795 0.021242889
## [822,] 0.888850053 1.0818228494 1.267691279 1.027389290 1.544032925
## [823,] 0.5811116198 1.7055755816 1.306388053 0.742117813 0.719002808
## [824,] 0.561467979 7.5299283087 2.311479545 0.727896954 0.577510027
## [825,] 1.399205653 1.4214830398 1.423974098 1.552221572 2.048627633
## [826,] 0.874732180 0.8195574254 2.744401381 0.333902740 0.114848158
## [827,] 0.275290421 1.9846460999 1.323497843 0.793607298 0.340432674
## [828,] 0.884626490 1.6051901912 1.395722630 0.186148449 0.709461038
## [829,] 0.479556390 0.5512122428 0.725377942 1.082928783 0.645937377
## [830,] 0.903945613 0.9771672523 1.527783435 1.133328693 0.997707846
## [831,] 2.176710994 0.1864782396 0.631773405 0.061703595 0.622540149
## [832,] 1.362301087 1.3548816478 0.335034120 0.482352510 3.211664735
## [833,] 0.838682861 -0.1860556447 1.212077615 3.948673859 0.940196794
## [834,] 1.9021111194 0.5645798885 0.921515902 0.788901096 0.867552853
## [835,] 0.672048680 1.2700837082 1.012176979 1.878000288 2.240205765
## [836,] 1.067550618 0.9902482822 0.968555263 0.515451105 0.366325669
## [837,] 0.810837713 1.0282994417 0.932618670 0.873473136 0.969244771
## [838,] 0.726103073 0.4902796762 0.987226376 0.319783968 0.181681293
## [839,] 0.919563877 0.3892211859 1.976029499 0.708291418 0.336426642
## [840,] 0.458975856 0.9525256797 0.292556896 0.373272538 0.315244416
## [841,] 0.971477194 0.8214261201 0.468395824 1.009850294 0.841132973
## [842,] 0.592781059 1.1789663118 0.901943459 0.891529808 0.796109366
## [843,] 2.790872408 2.5618652372 0.158550039 0.836044654 0.760451463
## [844,] 0.687764441 1.1384202579 0.845097218 0.352993106 0.539373403
## [845,] 1.739226652 1.1643333981 0.785103218 0.425246035 0.495951064
## [846,] 2.926910146 0.4956100097 1.411098288 0.254141454 0.960694399
## [847,] 3.681244760 1.0680110484 0.472286561 0.458940023 0.646753376
## [848,] 1.402847599 0.0197608617 0.724448848 0.218101210 1.216040179
## [849,] 1.728961475 -0.3586254521 1.159542709 1.691280199 1.817256138
## [850,] 1.695334052 0.7882923682 -0.163613366 0.374205085 1.776026349
## [851,] 0.754012165 1.0975119306 0.468600438 1.051744150 0.811651828

```

```

## [852,] 0.994131886 0.3401777342 -0.169996858 2.019847920 1.854142724
## [853,] 0.503740066 0.7783068303 1.060055104 2.294111285 0.302457105
## [854,] 0.328736113 0.3550802987 1.642700224 1.182366901 1.758307561
## [855,] 0.409875717 1.0064979348 0.510684547 0.965226370 0.901035225
## [856,] 0.532117950 -0.0231350839 0.695043181 0.442633723 0.133105700
## [857,] 0.518044307 0.6679627565 0.192965521 0.102024483 0.809083367
## [858,] 1.956843887 0.8370403086 0.523672009 1.013547503 0.770874857
## [859,] 0.193596935 1.3629927818 0.247747912 2.337736413 0.213141367
## [860,] 0.242339966 1.1794215521 1.708797294 0.716980649 0.377576279
## [861,] 0.664305333 0.5708965722 2.074523901 0.265953961 0.318341300
## [862,] 1.298309629 0.4166503584 0.931590272 0.598426610 1.652547981
## [863,] 1.341883493 3.2264453515 0.471685837 0.595355468 0.644961400
## [864,] 1.971925748 0.2960030829 0.466132201 3.522231248 -0.095678085
## [865,] 1.1900000590 0.7548689929 0.409112406 0.841579970 0.260233296
## [866,] 0.267808620 0.4976573192 1.528631204 1.053576637 0.295842600
## [867,] 1.594386853 1.8777959860 0.463218124 1.379801343 0.762741701
## [868,] 0.591733634 1.5903036951 2.675345985 0.905226648 0.502540939
## [869,] 0.147476382 0.3536725821 0.769771644 0.421043345 2.266687738
## [870,] 1.177916818 1.2414655297 1.198122301 0.517411434 0.368373716
## [871,] 0.858952265 0.6119463917 2.472516399 0.850513632 1.658932467
## [872,] 1.694188467 2.2996338502 0.340079908 0.466220606 0.881357502
## [873,] 0.605415768 0.2820439633 1.546987787 0.411340714 0.985421028
## [874,] 0.792939761 0.4902167166 0.986598503 0.108712590 2.271187561
## [875,] 0.354692773 0.9825673455 0.782899737 1.176083559 0.744091749
## [876,] 1.026323364 0.7185197056 0.801995233 0.254981036 0.996855327
## [877,] 2.635899670 0.3657638967 1.016302256 0.931716169 1.004669339
## [878,] 1.860985981 1.1000281125 1.985073415 0.971494704 3.067039570
## [879,] 0.960100475 1.1652135726 3.691815465 1.410923405 0.343817882
## [880,] 0.691316789 0.1985592468 0.678819633 0.943592828 -0.019358919
## [881,] 0.427894665 1.5207128778 0.837841044 1.020364276 1.194432099
## [882,] 0.991248289 0.5013656434 0.760456631 0.991649543 1.238536861
## [883,] 0.031729506 1.3669891646 1.054515992 0.542211553 1.298270551
## [884,] 0.629168237 0.8853031934 0.857106883 -0.055129200 2.863571286
## [885,] 2.029666760 2.0985876591 1.357068329 1.709609411 4.274415330
## [886,] 0.822389839 0.5260023550 1.074654799 0.784845867 1.247087084
## [887,] 0.394923022 0.3237510643 4.568916411 1.068570009 0.199673753
## [888,] 1.301647130 0.7174843590 0.439047977 1.725842166 0.661757051
## [889,] 1.687756981 1.5299549833 1.306300359 0.716539659 0.559378509
## [890,] 1.129338168 1.1237279035 1.291475745 1.573150394 0.147434344
## [891,] 0.523714141 2.3734883278 0.648384426 1.986544583 0.337985056
## [892,] 0.416996190 1.2897664513 0.305745469 0.493578835 1.060989704
## [893,] 1.972441617 0.7025788281 1.090369864 2.287024077 -0.043318371
## [894,] 0.564729671 1.0622696658 1.070985045 0.194012513 1.470509031
## [895,] 2.571500067 1.4681555546 1.026444101 0.792069225 2.079284032
## [896,] 0.264283237 1.6737755773 0.924929922 2.562832990 0.515364147
## [897,] 0.837973851 2.1084927725 0.708054391 1.876535152 0.877165791
## [898,] 0.408384102 1.3523999423 1.179178886 0.356766374 1.456408288
## [899,] 0.418355902 1.6446072813 1.678605038 2.107191642 0.834162561
## [900,] 1.862450349 1.2227963561 1.943246151 0.691338511 0.164625226
## [901,] 1.705684968 0.4231743511 0.664454616 0.467703719 0.490588987
## [902,] 1.267109588 1.5100671145 1.798677904 0.287242600 0.782664805
## [903,] 1.704860087 0.5635558311 0.321177877 0.826745281 1.072337784
## [904,] 1.471633766 4.1350221944 0.636524857 0.672772876 2.339835687
## [905,] 0.971267456 0.1178999710 1.239607806 0.459859995 1.494580524

```

```

## [906,] 0.404307333 0.9284354274 0.880209523 0.836523299 1.179594472
## [907,] 1.933586689 0.4131285595 1.817623308 0.831619041 -0.084870816
## [908,] 0.877494494 1.9089424177 0.320659674 0.304843501 1.403037492
## [909,] 0.032413465 1.3734787821 2.569874910 0.593564706 0.957600101
## [910,] 2.889460969 0.4151854681 2.140481840 1.213471036 3.543634537
## [911,] 0.763982321 0.8918991151 0.635425775 0.637573470 1.528234020
## [912,] 0.405877130 1.6227623149 1.722191452 0.541800134 0.103407907
## [913,] 1.619335391 0.9000774391 1.111644497 0.687328557 2.540822559
## [914,] 0.478258399 0.6380556781 0.214801896 1.494680080 -0.015133577
## [915,] 0.656993519 0.9121351757 1.505021237 1.833390307 1.022270685
## [916,] 1.254654534 0.9785049197 1.072407495 0.390084019 2.614010814
## [917,] 1.679327411 1.2551055408 1.897769324 0.244783669 0.510555729
## [918,] 2.788369619 0.5273223769 0.826455906 1.997502297 2.064890988
## [919,] 0.174009971 0.9464376538 0.957059695 0.811498704 0.219133401
## [920,] 0.602776574 0.7270823901 1.238609288 0.838567316 2.652018690
## [921,] 0.156547147 0.5449253719 0.973866455 0.680192199 0.243548410
## [922,] 1.741553610 0.8798105449 0.413100573 0.987808547 0.566776225
## [923,] 1.209612884 0.7977286996 0.354934512 0.475795565 0.401550688
## [924,] 0.632285927 0.8900103708 0.745657480 0.523746322 0.619492630
## [925,] 1.898401215 0.7648584535 0.878418803 0.532858197 0.735208131
## [926,] 0.858138217 0.4064976051 1.155867433 0.188962337 0.385833315
## [927,] 0.231377364 1.0322405839 1.073098026 0.276913368 1.241904067
## [928,] 0.776517607 0.4285994980 1.759788831 2.123591900 0.891986694
## [929,] 0.822208257 0.4980249414 0.936175184 0.577114958 1.539100926
## [930,] 1.234576192 0.4721033619 0.318883794 1.447064820 1.557105520
## [931,] 0.844411811 1.0193208898 0.885702897 0.426671983 2.436185144
## [932,] 0.427142412 0.9387343895 0.275891816 0.727250732 0.096279751
## [933,] 0.394283927 3.0811312326 1.064797956 0.274737725 1.214252721
## [934,] 0.687057596 0.5398116141 0.624809040 0.541522326 0.870355660
## [935,] 1.568563495 1.7486195726 0.287712672 1.601628956 1.692657954
## [936,] 1.668825603 2.2021271065 0.893987195 1.484282537 0.526628992
## [937,] 0.687906301 1.4475946536 2.106450587 0.799477228 1.193090757
## [938,] 0.538753687 0.9878298808 1.373966086 0.914368545 0.348101631
## [939,] 1.508097349 1.0405225747 0.644173214 0.545577370 3.709974067
## [940,] 0.734623020 0.5529410715 0.226164580 0.050612988 0.254768470
## [941,] 2.965499180 0.1421003289 0.004298088 1.067436648 2.455326514
## [942,] 0.441885088 0.4961436113 0.617085321 0.736901148 0.425026974
## [943,] 2.232735871 0.9432827230 0.185182569 1.791785110 0.719610950
## [944,] 0.750205669 3.1256843161 0.838939823 0.215288224 0.716441961
## [945,] 0.563392205 1.5501283901 3.516787627 2.251605541 0.272245909
## [946,] 1.063787768 2.3779097016 0.546095563 1.925173495 0.591405095
## [947,] 2.630683093 1.2831292460 1.831752855 0.496514378 3.239479735
## [948,] 1.902715566 0.7191057741 1.796421415 0.716566833 0.398717927
## [949,] 0.804012488 1.6396693829 0.868946593 0.842726988 0.260197059
## [950,] 0.765335844 2.1546273298 0.504261360 0.385089921 0.837710204
## [951,] 2.023240479 0.7716866291 0.780462781 0.305380569 1.106621704
## [952,] 1.743478358 0.7277603342 0.815786203 1.533956129 0.111722854
## [953,] 0.687204754 0.5328700363 2.560344258 0.466495554 0.758625260
## [954,] 0.046483040 1.1106009175 0.829448005 1.303308634 0.272138835
## [955,] 0.983890743 1.3631721607 0.871851339 3.352341554 1.476365315
## [956,] 0.765324338 2.5547758469 0.360569246 2.500694179 0.541146904
## [957,] 1.055674083 1.3018261002 2.723342979 1.718861991 0.213631981
## [958,] 1.383604138 0.8608619707 1.414703387 0.845714615 0.607416517
## [959,] 0.669635938 0.7419068838 1.150046191 0.977181390 0.342088686

```

```

## [960,] 1.437105342 0.7184785943 0.525980444 0.165495699 0.343054959
## [961,] 0.224937323 4.6083789922 0.458220804 2.148161864 1.352965763
## [962,] 0.991635795 0.8706762633 0.323431208 0.857822582 1.238175615
## [963,] 1.795369330 3.3286843781 0.263187145 2.456757874 0.794121644
## [964,] 0.798408484 0.7369220131 0.729544112 1.702405474 0.234629845
## [965,] 1.562774382 1.5479476391 2.173393449 0.827935937 0.698319322
## [966,] 0.854736962 0.6422679586 0.319142225 0.602046756 0.444178570
## [967,] 0.148917024 0.6522473700 0.905824873 0.223701978 4.029714947
## [968,] 1.463059340 1.2244739611 0.333560052 0.688249841 1.804444694
## [969,] 1.333263646 1.3756557356 2.574346981 1.249533364 0.971186597
## [970,] 1.298180731 0.3841539526 0.594098613 1.621797889 0.605430815
## [971,] 1.495533367 0.0007172572 2.904741568 0.497094029 0.859168164
## [972,] 0.448667690 1.3435919624 0.744861896 0.378133551 0.678586471
## [973,] 1.003799812 0.6261253238 0.294872628 0.585555723 0.670883736
## [974,] 3.485302236 0.6419385951 1.273861105 0.275295532 1.440918944
## [975,] 0.636824642 2.1300554202 1.052026324 0.937451543 0.787578195
## [976,] 0.809784514 0.1905228665 1.851874094 0.438721750 1.389016721
## [977,] 0.818997970 0.4925074300 1.077473307 0.791409532 0.328802485
## [978,] 0.596291460 1.7951913001 0.583214258 2.200367530 1.213074606
## [979,] 0.419791501 2.3387366884 0.730811823 0.178549689 5.094186210
## [980,] 0.596044319 0.9812680196 0.350012127 1.083879837 0.772818862
## [981,] 0.624067574 0.7530919353 2.007961626 1.102473498 0.402090645
## [982,] 0.513043609 0.6955839384 0.298361204 2.761902085 0.645488204
## [983,] 0.497971780 0.5628362359 0.396159219 1.145477335 1.331104756
## [984,] 1.494791885 1.2229093231 1.076947203 0.919028943 1.464687993
## [985,] 0.322276442 0.4618830916 1.071953196 0.816766020 0.316182345
## [986,] 2.768488337 0.7685874134 -0.175163770 0.585296705 0.575260121
## [987,] 0.677004105 0.9228335098 1.037527015 1.472287223 0.388714882
## [988,] 0.329602103 0.4188746356 0.449805195 0.151983006 0.758582309
## [989,] 5.451376816 1.2998889734 1.193711305 1.901113550 1.319582714
## [990,] 0.861933859 0.5840699905 1.128151896 0.527660633 0.747284713
## [991,] 2.825326234 1.0296186888 1.580203766 2.326288325 1.703194473
## [992,] 0.535046719 0.9832993282 0.567972591 1.447069889 0.685279484
## [993,] 0.313670474 1.7351530415 0.914019012 0.446218911 1.890632006
## [994,] 1.551972888 0.1756214031 0.278461032 0.260354251 0.699081462
## [995,] 2.149097820 0.3524947273 0.221773044 0.656423332 1.095697908
## [996,] 4.006730039 0.1716581795 1.690645508 0.814613535 0.764666601
## [997,] 1.002699221 1.2138594489 2.391057128 0.741721133 1.309027025
## [998,] 1.327499074 0.3626658462 1.042983248 0.841701705 0.502204043
## [999,] 0.627041490 -0.0005917208 1.691614021 0.336959284 1.188308885
## [1000,] [,6]      [,7]      [,8]      [,9]      [,10]
## [1,] 1.251748247 1.7223045606 2.629086133 0.123000709 1.893106785
## [2,] 1.114033027 0.9127100280 0.209452559 1.638053706 1.087014609
## [3,] 1.850288631 0.7856975610 0.900877237 -0.018540818 0.268341269
## [4,] 1.389481745 3.2332358673 0.518670175 1.414317178 0.352723987
## [5,] 0.647169235 1.1031839194 0.581256316 3.492482574 0.964226718
## [6,] 1.562608666 0.3647976989 1.717350919 0.610468532 0.998119836
## [7,] 0.346745730 0.9351195671 1.744337572 2.645962801 1.893291217
## [8,] 1.302992364 0.7114095423 1.408580562 1.756402180 1.426118969
## [9,] 0.743287970 0.2940074452 0.321934321 1.413696756 0.337788778
## [10,] 1.444458607 1.0492338615 2.623944429 2.137841539 1.580044923
## [11,] 1.041204065 0.4793631436 1.147480084 0.895048482 1.976233387
## [12,] 1.857878441 0.5044654484 0.142935880 0.449804072 -0.014167151
## [13,] 4.271482987 1.4538391771 0.198333543 1.859476972 -0.041598544

```

```

## [14,] 0.237554878 0.1649338298 1.257130688 0.582768947 0.304689612
## [15,] 1.496476121 0.3786385627 0.645220298 0.221326987 0.281920055
## [16,] 0.788879153 0.6953887183 0.160026060 2.220673283 0.442284943
## [17,] 2.509282946 1.6240073610 0.426400532 1.287624882 0.298244359
## [18,] 1.053019885 1.7588660445 0.838943596 1.725793650 2.492155155
## [19,] 0.263185749 0.3118562533 1.255912380 1.115436998 0.065880670
## [20,] 0.649063124 2.4419234780 3.105995381 0.309179220 2.907502204
## [21,] 0.267273536 0.7485269623 0.276176601 0.545550290 1.238669516
## [22,] 0.722653769 1.1187401117 1.874686707 1.113128857 0.864768100
## [23,] 0.851602045 3.9533677261 0.772435614 0.470150447 0.418754701
## [24,] 0.998061980 0.9394253324 1.420255323 0.822290507 0.185869548
## [25,] 0.163302431 1.5409352394 0.750696531 0.656541825 0.284529411
## [26,] 0.411343235 0.2501398245 2.224318010 0.320603298 1.135382902
## [27,] 2.326053714 1.2115719605 2.088779898 0.543642152 0.249778484
## [28,] 0.262307064 1.0990172028 1.283785771 3.998361094 1.756752804
## [29,] 0.681933374 1.3088747349 1.110573329 1.634188562 1.325643011
## [30,] 0.197240141 0.3518854378 0.398300364 0.812495654 0.858578100
## [31,] 1.346269827 0.0001162827 0.481340763 0.198212300 0.237505012
## [32,] 0.913843875 1.2956354828 0.422873356 0.874327885 0.220717473
## [33,] 1.194248874 1.0695654444 0.470546752 0.793783896 0.757743675
## [34,] 1.646607927 -0.0333814763 0.748326181 0.661548496 0.381445155
## [35,] 1.362936275 0.3521170553 1.163128452 2.527068099 0.777492343
## [36,] 0.847751226 1.6744638074 1.120957906 1.137006668 1.497369802
## [37,] 0.421852948 0.7554047587 1.106196999 1.394422363 0.025738421
## [38,] 0.978712459 0.3440763908 1.353777077 0.247740191 0.574301934
## [39,] 1.351491599 1.9095239114 5.832335788 1.658667649 0.622884971
## [40,] 1.750482708 1.0243258081 1.761677157 1.078490177 0.851030700
## [41,] 1.223571875 0.2920340793 0.842035335 1.303168776 0.525947010
## [42,] 2.471329973 2.4064326919 1.351348610 2.198034126 1.307340801
## [43,] 1.076911591 1.2817559762 -0.267426042 1.089380022 1.571890688
## [44,] 1.084102234 1.1620448775 1.422945133 0.180789150 0.481241242
## [45,] 0.961945917 2.4328730011 2.042894851 2.036335934 0.043463313
## [46,] 2.951532641 2.0204989547 0.718668134 0.901245581 1.272656267
## [47,] 0.283401251 0.6325013298 2.044592760 0.728231797 0.468418536
## [48,] 0.284445550 0.7389371270 1.321293194 0.838865399 0.761805988
## [49,] 1.026169544 1.3677995090 0.911737226 1.408960398 1.265922505
## [50,] 0.699767184 0.4776205701 1.161361572 0.233702203 0.257138336
## [51,] 0.537827965 1.4906169837 0.336945607 1.227600718 1.177369883
## [52,] 0.729339349 2.1902298877 0.547772250 1.049921932 0.746633436
## [53,] 0.585586366 0.0942964693 0.414013376 1.446194454 1.821222561
## [54,] 0.976515613 0.8356340004 1.322452011 2.088297918 0.743999288
## [55,] 0.240917183 0.6187216845 1.339269247 0.592299039 1.512886153
## [56,] -0.186699974 1.6050121310 3.549526373 1.516818365 0.205910269
## [57,] 0.576868263 4.0790160693 1.023922767 0.261074786 3.045949044
## [58,] 0.368421568 1.4098227022 0.259836768 1.109655098 0.720607132
## [59,] 0.927488362 2.5335669445 0.637087971 0.243434395 0.047706845
## [60,] 0.248668982 0.6255763862 1.447208814 1.936553136 0.729031670
## [61,] 1.116200654 0.4643265502 1.293987985 0.317896485 0.159232605
## [62,] 1.107619894 0.5800815061 3.461065890 0.329245959 2.075502204
## [63,] 0.360445505 0.6826812483 1.604565008 2.499209246 0.987081004
## [64,] 1.118507627 1.3794992730 0.734707382 1.000039089 2.128839353
## [65,] 1.609486666 0.6187505233 0.684536166 0.631318026 0.336209477
## [66,] 2.663867056 0.8203039190 1.745122031 0.627954361 1.597243593
## [67,] 1.464799235 1.1734634399 0.253481989 0.292205099 1.160062425

```

```

## [68,] 1.805369753 0.3146830659 0.693683106 1.590552946 1.122216042
## [69,] 0.328236813 0.2672253788 1.206866904 1.089404166 1.321830204
## [70,] 0.888336759 0.8578009043 1.981317827 0.122792649 1.867349443
## [71,] 0.125907912 0.8915830215 0.781050492 0.435383761 1.531856959
## [72,] 0.089451328 0.4468654908 1.062077990 1.125810896 0.432205152
## [73,] 0.497383245 1.3128893463 1.236960246 -0.161966046 0.421800527
## [74,] 2.125935023 0.7640647808 0.301698242 0.683833157 0.198052729
## [75,] 1.211333636 1.7539564593 0.327260897 0.487102655 1.700989868
## [76,] 0.993239224 1.4566703675 0.642208235 2.278371309 1.826649840
## [77,] 1.307801324 1.1327762657 1.629509571 1.269224713 1.072614548
## [78,] 0.233186981 0.9370837842 0.392275445 2.380810455 1.148206101
## [79,] 0.499464652 0.5842473399 1.266059327 1.510137195 1.006696840
## [80,] 0.887002641 1.2643475286 1.581609568 1.221966588 1.483807856
## [81,] 0.868081823 1.6570796381 1.667969644 1.792065118 2.736726191
## [82,] 0.368451668 0.4796471083 0.825731829 0.994169356 0.450940747
## [83,] 0.862740627 1.1912142717 0.335929289 0.041052747 0.923183923
## [84,] 0.519860533 1.0140529184 1.020859874 0.403769081 0.474499906
## [85,] 0.570945040 0.5496423373 0.716856769 0.061474887 0.691371328
## [86,] 0.477311614 1.4273243957 1.845158014 0.511952989 0.479847557
## [87,] 0.445136148 1.7681047808 1.097503766 1.489691531 1.854026223
## [88,] 1.577300129 0.9552487079 0.353937447 0.352114535 0.986095236
## [89,] 2.040425704 0.5782420963 1.631128131 1.982072640 0.375591453
## [90,] 0.517227687 0.1053116506 0.290508908 0.408411891 1.334643583
## [91,] 0.844718588 1.2980689935 1.136688698 1.164738266 2.035886743
## [92,] 1.751911583 0.4561498623 0.151883767 0.405646306 1.358840203
## [93,] 1.173382599 1.0083257710 0.001112915 1.153675851 0.953454987
## [94,] 1.234840000 0.1555974821 2.080450873 1.450874963 0.271117713
## [95,] 0.763855482 0.7806781184 0.779572754 1.202835164 0.640296399
## [96,] 0.475668045 0.6339682857 0.598771504 1.091557133 0.597948112
## [97,] 1.711949321 0.7959609449 0.309511607 0.698854379 1.280286594
## [98,] 0.557729983 2.3127180250 2.162815863 1.110072494 1.293480897
## [99,] 0.441961159 0.5522179201 0.369071868 1.845326032 1.270924895
## [100,] 1.178058292 1.1369550273 1.183969111 2.540332511 0.627442474
## [101,] 0.693114321 1.3209297921 1.729140426 1.600946089 0.898627725
## [102,] 0.906862778 1.0150691324 1.032658432 1.104996046 1.407673359
## [103,] 1.121266380 1.0069348969 0.246454045 0.553178578 0.268150414
## [104,] 0.664629249 0.9348295470 1.393592950 1.046972692 1.084749782
## [105,] 0.478820373 0.9229863059 0.532088212 1.139364262 0.502463373
## [106,] 1.368278429 0.3947738500 0.678030842 0.262300962 0.040923230
## [107,] 1.026629252 0.5623157533 0.791207209 1.760143283 0.483313879
## [108,] 1.490095427 1.3814576205 0.285482791 1.424109271 0.824574143
## [109,] -0.018591658 0.6311648917 0.233448916 0.360758889 3.301897752
## [110,] 0.744875925 0.3963713384 0.560560646 0.238750851 0.519942434
## [111,] 1.695200983 1.2518519812 1.536008452 0.640572666 0.714493722
## [112,] 0.405498770 1.6498780629 1.248563268 2.172882103 1.352470364
## [113,] 1.208318501 0.4225845946 0.390504414 3.376530251 0.777568262
## [114,] 0.864284318 2.7746424695 0.540714838 0.355372315 1.133149412
## [115,] 1.003491379 1.6258922304 0.616201630 0.612066652 1.058802606
## [116,] 0.865526900 1.9060881999 0.787032896 0.909713058 0.460376741
## [117,] 0.413657325 0.4121099580 1.144988368 1.460452207 0.635065739
## [118,] 0.525106389 0.4904748050 0.680445333 0.156876345 1.017108377
## [119,] 1.453143656 1.0383687415 0.509818241 1.403934738 0.956774413
## [120,] 2.319173410 0.8766741408 2.060158023 1.284264259 0.916051787
## [121,] 0.337210438 0.9407119377 1.953029814 0.845741574 1.218723575

```

```

## [122,] 1.142700471 3.0984296855 1.977642715 0.899167127 2.487224754
## [123,] 1.485334739 1.2885201556 0.489766287 0.719400969 1.115735454
## [124,] 0.842510958 0.3022656097 2.183615223 1.902313839 0.668367030
## [125,] 0.171948147 1.5719137923 1.266561811 0.585258599 1.122296918
## [126,] 0.507412618 0.3143746358 2.000405924 0.868022031 -0.028195309
## [127,] 0.781910455 0.9916731616 0.593266443 0.800580142 1.939939589
## [128,] 0.302834893 1.6793344013 1.052328823 0.570295058 1.529381023
## [129,] 2.188277756 0.9027578130 0.546045455 1.254642373 0.913101456
## [130,] 0.257815822 0.5658237386 3.190575179 0.191705947 0.064784689
## [131,] 1.094198538 0.9230545381 1.209157569 2.704375383 1.885161180
## [132,] 0.295000164 1.7957357428 2.436782866 0.856674964 1.284460011
## [133,] 0.879497467 0.2149998132 0.604443232 0.685765289 0.267779842
## [134,] 0.900004469 1.8620525945 2.468723032 0.463320401 0.266190527
## [135,] 1.342163074 1.4288449927 0.051138953 1.452932587 0.475241760
## [136,] 0.600542149 0.9318623575 0.526700926 1.240613032 1.279772378
## [137,] 0.197182230 1.4953173935 2.000371242 0.431996926 0.131396336
## [138,] 0.383099045 0.3476050288 0.450153354 2.010979679 0.776652126
## [139,] 0.842447154 0.9353717279 0.619825771 1.379735656 1.864340573
## [140,] 2.050603605 1.36151719646 0.305424629 3.063021219 1.096007049
## [141,] 0.318616483 1.1162381316 0.545413044 0.171373518 0.856048529
## [142,] 0.640844040 0.4068066563 0.696512178 1.161580369 0.463905242
## [143,] 0.298472060 0.4166329360 0.330003832 2.076884404 1.741835044
## [144,] 1.378111676 1.5757270029 1.747085124 0.425151011 1.318704958
## [145,] 1.305569352 0.6867964348 0.941013758 0.183103283 1.887977222
## [146,] 0.982146058 2.5231124801 0.653141286 0.319607605 2.885466549
## [147,] 0.363530076 1.2085789337 0.561392624 1.379258085 1.228864080
## [148,] 0.561263823 1.1960144073 1.480730254 0.660241636 1.414701441
## [149,] 0.824067013 2.5330658982 0.829209536 0.495923549 0.787022830
## [150,] 0.308166086 0.2563184783 0.432285398 1.022825634 1.009708488
## [151,] 1.104619624 2.4829825812 1.290234629 0.496405111 0.418980806
## [152,] 1.758543002 1.6534430491 0.395611934 0.051003581 0.394421576
## [153,] 1.834338760 1.1401432589 0.507754048 0.986081665 2.384442538
## [154,] 1.375498198 0.3300514843 0.345763634 0.334234208 1.983703333
## [155,] 1.136536977 1.1133086707 0.390376090 1.749785792 1.288092206
## [156,] 1.186306136 1.4307018287 0.859456551 2.042810171 1.505331958
## [157,] 0.775384812 0.5445691030 0.802720190 0.211470545 0.681059149
## [158,] 2.238535560 2.0329186689 0.957772346 1.630717267 0.696118998
## [159,] 1.252247618 0.8065810521 0.746725311 0.448235167 1.633525835
## [160,] 1.231603641 0.6484159761 0.776366191 0.216020894 1.239257422
## [161,] 0.994465322 0.5747243977 0.294503452 2.015268779 0.116151092
## [162,] 1.889683136 1.1617234768 0.632253261 1.343835155 2.333321950
## [163,] 1.304335047 1.0548665010 2.109614493 0.927918929 1.751545341
## [164,] 0.910139559 2.2037704566 1.554193430 0.795801626 1.523224027
## [165,] 2.511517928 0.9718950995 0.561688441 0.934283637 0.711178284
## [166,] 0.925069353 0.9804006295 0.193577469 1.166615931 1.140539673
## [167,] 1.094828118 0.4266105596 1.923377052 1.013700988 0.782695560
## [168,] 0.991087830 1.2319447568 2.090010699 0.503017976 0.426945911
## [169,] 2.233081745 4.4766139195 1.100532225 1.691933032 0.294227302
## [170,] 2.744853023 0.5717902263 0.421995019 0.736702923 0.829642512
## [171,] 0.835160259 0.4701853532 0.613007572 1.414911276 2.043437079
## [172,] 2.492011238 1.5772770182 0.738041352 0.116282646 0.412490097
## [173,] 1.675496203 2.2244544533 1.328362009 0.439361341 0.799898600
## [174,] 0.482007174 0.7476227004 1.108229870 0.332328021 1.684253651
## [175,] 0.977678142 0.3509338560 0.106613000 0.773273391 0.254186666

```

```

## [176,] 1.008001611 0.6810700126 0.666013059 0.148885761 2.063544925
## [177,] 0.448692035 0.5104741417 1.368813983 0.628485412 0.328167092
## [178,] 0.946454909 0.4155436107 0.394197883 0.905635217 1.127937250
## [179,] 0.448350482 0.7816446021 0.290785740 0.182126593 1.307550105
## [180,] 1.290708787 0.4624829977 0.392554794 0.060445360 0.339454454
## [181,] 0.426497979 1.6297205708 0.497512247 0.354182552 1.338702065
## [182,] 2.197556024 0.6397030104 0.141949074 0.869929354 0.741659835
## [183,] 1.055808126 0.8893017632 0.391030444 0.789148928 0.595112275
## [184,] 1.008487676 0.3294821066 0.293015934 0.460913787 -0.127577072
## [185,] 0.842352740 1.9047347125 1.602762309 0.532302302 0.330751743
## [186,] 0.945042539 1.6524765919 0.603326554 0.838927503 0.727030381
## [187,] 1.429404445 0.1670199938 1.077266107 1.271464726 1.189743473
## [188,] 1.290625251 1.3414126322 0.461800413 0.271441524 0.239562499
## [189,] 0.542501439 1.4403722520 0.251186398 2.994202435 0.076953699
## [190,] 0.169143197 1.0706687686 0.426671911 0.546882347 0.695768431
## [191,] 0.472288125 1.1526260793 1.275932882 2.210486382 1.120268139
## [192,] 0.842066140 1.5934553693 1.208843006 0.624058835 1.335177217
## [193,] 0.748270778 1.2140635976 0.094085786 0.781176815 0.178633065
## [194,] 1.119015405 0.9542093513 1.279414660 0.435748718 0.362569305
## [195,] 1.622670747 5.5445784936 0.847859442 1.186620228 0.352935967
## [196,] 1.619855605 0.2777768291 1.049632899 0.137311644 0.245356938
## [197,] 0.546831606 0.9363636394 1.192067392 2.069043635 2.124014190
## [198,] 0.854503765 1.1148722877 0.933023716 1.576535903 0.212370625
## [199,] 0.331542951 0.6300910222 1.014322678 1.462701379 1.744204317
## [200,] 0.782264281 1.7029662917 1.299063109 0.843971958 1.027972081
## [201,] 0.676179801 0.1541578769 0.829493516 0.124441566 0.728064904
## [202,] 1.962352577 0.9628700303 1.664550934 0.316433819 1.269573662
## [203,] 2.205363211 1.0576815982 0.441001160 0.613231434 0.237094271
## [204,] 2.042708449 0.0649564975 0.421466266 0.724574370 1.446107670
## [205,] 0.718157151 1.0364858547 0.783157044 0.423471512 0.916588248
## [206,] 1.674881858 2.3916646457 1.418609181 0.367044850 1.059759051
## [207,] 0.278741464 0.9163821870 0.419908197 2.163187593 2.491163201
## [208,] 0.625560583 3.2023841023 0.471177433 1.104567771 0.689128503
## [209,] 1.659782014 1.1781477166 0.321147979 0.634596604 1.353976560
## [210,] 0.691628736 0.4067060250 2.967186817 1.018641659 1.947844049
## [211,] 0.454038475 1.8108075510 1.567847028 0.626570277 0.390540747
## [212,] 0.240360512 0.5380269899 0.440157079 0.048286142 0.172851858
## [213,] 0.418667676 0.4719141300 1.249017508 1.096163280 0.229644488
## [214,] 0.492805635 1.9213649287 0.680266179 0.506234111 2.674150960
## [215,] 1.810507869 0.2432659582 1.717086418 2.002865893 1.478123900
## [216,] 0.515924799 0.2485306582 1.702198203 0.376764918 0.814073407
## [217,] 0.033992666 0.7397890157 0.333125954 1.298744454 2.042627304
## [218,] 0.587326149 0.6095086107 1.401206005 0.963581495 1.407695350
## [219,] 1.040997671 0.5634401606 0.060967029 1.384627100 2.428578289
## [220,] 1.211224123 0.7162067595 0.830878144 0.505235893 1.812720754
## [221,] 0.638291458 0.4424662278 0.351791055 1.174134851 1.347025978
## [222,] 0.246605647 2.4542436157 0.566088855 1.005196234 0.868921554
## [223,] 2.029627371 1.9103563514 1.589008817 0.578951209 0.727005274
## [224,] 1.033025032 1.5529627539 1.254672317 0.551567472 1.674094599
## [225,] 1.198221935 0.0772668328 0.898432038 0.550351182 0.190217426
## [226,] 0.345838253 1.9582166040 0.680503968 0.370850423 2.589300783
## [227,] 0.469355873 0.5090607882 0.573346119 0.374926539 3.533618920
## [228,] 1.824379594 0.6032536591 4.114920732 2.084474163 2.030693757
## [229,] 1.279389805 0.8186672678 0.206514806 -0.001853052 0.943003190

```

```

## [230,] 1.319348791 1.0291160139 0.305943023 1.289301503 0.739197012
## [231,] 0.396794645 2.3042002032 0.250744573 1.084900247 0.258013391
## [232,] 0.473570513 0.1728383248 1.104889198 2.132200602 0.884694110
## [233,] 0.590524080 1.8496443162 1.048939348 0.237589313 2.641528459
## [234,] 0.545810580 0.5448667940 2.991078495 1.568136495 3.269387445
## [235,] 0.309539507 0.1387218149 1.671750105 0.635736263 0.477298174
## [236,] 0.649527781 -0.0100268291 0.338269621 0.350256204 2.607748928
## [237,] 1.579945557 1.2954660898 0.656552154 0.958866705 0.745912650
## [238,] 1.223552624 2.6429603724 0.276011156 1.907523030 0.946937872
## [239,] 0.010845082 1.4001386078 0.690476349 2.087262033 0.705894763
## [240,] 0.305330191 2.6039108796 0.533796712 0.697174919 0.497489122
## [241,] 0.571315768 0.9734127085 0.687751740 1.845655951 0.641277862
## [242,] 0.871585158 0.9183328017 0.643760898 0.811431693 2.040838716
## [243,] 1.057743932 1.6967005655 1.485793928 2.073714670 0.599383600
## [244,] 1.391353848 0.3296845664 0.842861389 0.677071038 0.711710078
## [245,] 0.512702774 1.3058837034 2.551827203 1.746578485 0.228169261
## [246,] 1.570502893 1.1297043515 0.863073826 0.849728944 1.435357188
## [247,] 0.271220654 1.1570656993 0.683630203 1.164924244 0.069909043
## [248,] 0.240126031 0.3255485912 0.787798321 1.353673619 1.454540032
## [249,] 0.839841979 1.1117104157 1.892532213 1.029818021 0.701742061
## [250,] 1.698033393 0.5877237804 0.623977798 0.017386455 1.789996227
## [251,] 1.001925849 0.8446825170 0.172930622 1.037416925 2.059631544
## [252,] 2.157746384 2.1044974299 1.039241783 3.675244261 0.385473156
## [253,] 0.604471447 0.8570364344 0.130631949 0.513524588 0.037672984
## [254,] 1.200247634 1.4012330173 0.733277038 0.627393621 0.589016747
## [255,] 0.486863638 0.4101937721 2.336369392 1.469749304 2.881090029
## [256,] 0.390056642 1.2978620639 0.327787025 1.385329004 0.423650816
## [257,] 0.108171173 1.1102807347 0.992472858 0.108991024 0.331832163
## [258,] 0.339942417 1.6218248631 0.314132640 1.030529552 0.623868737
## [259,] 0.423156754 0.4651449615 1.371798584 1.481843710 0.252484614
## [260,] 0.916621022 0.6779859619 0.540963700 1.994032987 0.177091952
## [261,] 0.831236621 0.7713900817 1.426166892 1.651457802 1.325711178
## [262,] 0.387533281 0.4714983106 0.637053920 0.738058794 0.536730719
## [263,] 0.078992243 0.7059986510 1.915982254 0.917070264 3.577488788
## [264,] 1.426592940 1.2346104765 0.098315643 1.131186621 0.728783636
## [265,] 0.354969259 0.5027741795 2.489731543 0.942781609 1.549348136
## [266,] 0.228810017 0.5940308128 1.925216908 0.528819918 0.765366438
## [267,] 0.540506866 0.8624359042 1.996080095 0.940933813 1.687524358
## [268,] 0.749148594 1.0464634650 1.246765646 0.653217798 0.193885236
## [269,] 1.091890059 0.3058215095 1.794727398 2.341006610 0.827812776
## [270,] 0.652157799 2.0264632413 0.598789128 2.199116247 1.766987572
## [271,] 0.274543685 0.1244800165 2.003374560 2.352107173 0.886019777
## [272,] 0.567422842 1.5461356274 0.730385021 0.448069244 1.181183021
## [273,] 0.840721326 1.1102391914 0.296150395 1.779451203 1.053213040
## [274,] 0.812019664 0.2250247344 0.535120971 0.862645004 0.627732665
## [275,] 1.250122963 0.2189708814 1.102796412 0.379964863 1.213071906
## [276,] -0.072301394 2.4882037631 1.943977097 1.263718738 0.871256574
## [277,] 2.031328101 0.6552589477 1.414634853 2.298095232 2.432241549
## [278,] 0.486135168 0.5415923528 1.024598182 1.772946801 0.294518191
## [279,] 0.077806189 0.1224631368 0.590044603 0.020963537 0.419795040
## [280,] 0.404972778 0.4162282557 0.543020231 0.799028827 0.673900394
## [281,] 0.534128134 0.5771778364 0.536640788 0.399908892 0.394231034
## [282,] 1.086983920 1.5123558974 0.929769490 1.515426220 0.154877394
## [283,] 0.889724197 0.7933388206 0.504677943 0.434081972 0.198463670

```

```

## [284,] 1.160255380 0.5116928819 0.784193336 0.180639369 0.541785243
## [285,] 1.573492068 1.3280549310 0.471680598 1.609734773 0.641156492
## [286,] 0.874847999 0.6087073705 0.976457792 3.317603229 2.309781001
## [287,] 0.956101420 0.6773885481 0.460708923 1.636476903 0.660716412
## [288,] 0.455404181 1.8138380446 0.529808563 1.076292753 0.065826330
## [289,] 0.440241470 1.3074295095 0.733310863 0.842409460 0.657567131
## [290,] 0.892398653 0.9249932794 0.983217372 0.874237956 0.007893308
## [291,] 1.125102694 0.2561997151 2.169030842 0.975673630 0.666089223
## [292,] 0.604352664 1.4922222221 2.054311987 1.110944558 0.619070348
## [293,] 0.157825313 0.2793238403 0.239057883 0.802704646 0.560340449
## [294,] 1.0003032902 0.1005030763 0.341727700 0.882947905 0.555577656
## [295,] 0.454571826 0.6519726576 0.778892927 1.497952479 1.225066827
## [296,] 1.455072231 0.5178165965 1.708695125 1.575252170 0.807030389
## [297,] 0.549512711 1.4276708302 0.493200416 1.928223468 1.467978245
## [298,] 1.216291459 2.9783239913 3.761344004 1.863094132 0.686167355
## [299,] 0.404278339 0.1778133035 1.029934906 0.262054038 0.899476561
## [300,] 0.949119313 0.6248499901 0.784898239 1.703084616 0.562581743
## [301,] -0.077931397 0.3243997597 0.711045288 0.023916408 0.536780661
## [302,] 0.598936068 0.4751705362 0.488587727 1.568958884 0.220931927
## [303,] 0.227539411 1.2236160022 1.295436010 2.189768131 0.893366737
## [304,] 0.879084487 1.4350504837 0.938269245 0.347806821 2.679681451
## [305,] 2.396484641 1.0333701763 1.529876183 0.306608475 0.693039669
## [306,] 1.036824902 1.0566991682 0.784936713 0.300475577 1.415332982
## [307,] 0.402262360 0.7421129517 0.387893914 0.962447509 0.424496107
## [308,] 0.500599564 1.5211477538 2.450890778 0.875656656 0.729184750
## [309,] -0.038253971 3.7117379086 0.711657594 1.197886604 1.125826900
## [310,] 0.294346739 0.5350487260 2.405260030 1.501002263 2.134844153
## [311,] 2.764197795 2.4226399779 1.458457314 0.582427021 2.497930456
## [312,] 0.462992778 0.6166015196 0.434799257 0.767163193 0.964017332
## [313,] 0.298505976 0.5710813494 0.976617374 1.558774261 0.586163390
## [314,] 1.004938959 0.7573236246 1.193465253 1.561771058 1.564855612
## [315,] 0.821487962 0.8548283768 0.724220038 0.794235514 3.567445326
## [316,] 1.499847170 0.9948355331 1.416787416 0.920477411 0.702609642
## [317,] 0.179411468 0.6187117519 1.526371336 0.622763277 0.043103739
## [318,] 1.555667984 0.3735268885 2.599145990 1.279579783 2.841671950
## [319,] 1.349199984 0.2734332851 1.895722591 1.442440899 1.829389446
## [320,] 0.990405510 1.1781074659 1.212613419 1.578566866 2.721232152
## [321,] 1.419647097 2.4699088650 2.566349085 0.945419342 0.358388374
## [322,] 0.647160210 4.8739960069 0.418233132 1.139205096 1.583116597
## [323,] 0.1893665320 0.2337495263 0.477291276 1.174614391 0.306615008
## [324,] 0.490734092 2.5977512642 1.993035475 0.593971528 1.363016330
## [325,] 1.057182885 1.3748205247 1.568863429 0.562580004 0.991571378
## [326,] 1.333417882 0.5534350677 0.736131769 1.334113738 0.583237654
## [327,] 0.796196942 0.5586180511 2.562005416 0.477044372 1.042256774
## [328,] 1.025965275 1.1953418696 1.156483333 3.927511804 0.399185911
## [329,] 0.325025770 1.7849394104 1.071716318 1.254175435 0.717001416
## [330,] 1.696775063 1.1204606479 1.252188401 0.627072598 0.605710303
## [331,] 2.794571597 1.0207474368 2.838065322 0.695872235 0.427883236
## [332,] 1.011057866 0.1065920757 1.307287610 0.220127065 0.291474757
## [333,] 1.604962664 2.4020805029 1.388299905 0.552561866 0.655344376
## [334,] 1.184647771 1.1214856941 0.837220366 1.259506751 1.075382167
## [335,] 0.862281389 0.6969378061 2.964220984 0.772764128 0.302118334
## [336,] 0.786605550 1.5599815883 0.727175370 0.837811361 1.532389875
## [337,] 0.796663662 0.8549448869 0.516111922 2.251302020 0.992485046

```

```

## [338,] 0.551702080 0.4270255593 0.789474663 0.433749002 1.712735995
## [339,] 1.221416883 0.7379240916 0.566340724 2.009313154 0.081437578
## [340,] 1.340622350 0.9926190845 1.836340786 0.497769190 0.774502960
## [341,] 2.331247059 1.1033035739 1.304197733 1.609804374 0.879546669
## [342,] 0.947024245 1.5428025716 1.661989333 0.721775413 0.178417514
## [343,] 0.583135314 -0.1718164962 0.546262975 0.476701202 1.596502560
## [344,] 0.347583580 0.8426218515 1.369041409 0.489965356 0.920398932
## [345,] 1.428362041 0.6689052434 2.153228134 2.173292145 1.813957459
## [346,] 1.313947319 1.2360610544 1.112806626 0.684656680 0.047744327
## [347,] 0.217642878 0.0286903152 0.746525564 0.726672718 2.826513959
## [348,] 1.033275539 0.4028351707 0.294231039 0.670901762 1.252282504
## [349,] 1.689302733 1.7859370412 1.750575352 2.067758206 0.072466724
## [350,] 1.193097570 0.3246261482 1.148080842 0.803733808 1.073176594
## [351,] 0.385993535 0.6198546855 0.334696143 1.265097659 1.722873860
## [352,] 0.022003549 1.4883246245 0.452091165 0.735425778 1.462807939
## [353,] 1.196956687 1.4670788776 1.104431409 0.701089688 0.414985510
## [354,] 0.373365080 0.8959209277 2.249688424 1.341995348 0.920147084
## [355,] 2.841174514 1.6339675130 0.780751952 0.483143866 0.409563716
## [356,] 1.001267436 0.4232720454 0.860299360 0.088938224 0.757398869
## [357,] 1.466396736 0.6283928652 4.165304463 1.453322821 0.469838599
## [358,] 0.585243573 1.5822235972 0.220330233 1.258969723 3.507656660
## [359,] 0.785318140 1.5156841809 1.376898135 0.539761553 2.262428222
## [360,] 1.074633558 0.9741501186 0.325384288 0.676391605 0.455013787
## [361,] 0.874044182 2.9126189490 1.645524417 0.799443226 0.559674370
## [362,] 1.671692240 1.1370284353 1.084533532 1.442230560 1.225398463
## [363,] 0.911941036 0.5096143158 0.358039889 0.160625303 0.392754903
## [364,] 0.563301293 1.4333225149 -0.073997398 0.732005333 0.566457772
## [365,] 1.342153584 2.8997658208 1.467407966 0.659010429 0.785258667
## [366,] 1.155093748 2.7824594834 1.129283323 3.215412324 2.696264275
## [367,] 1.280755799 1.2355332039 2.499967956 0.760561218 0.909182669
## [368,] 0.886683460 0.1661904732 0.863374949 1.419477800 0.660391427
## [369,] 0.705479240 0.8246229483 0.870814688 0.966050718 0.479736516
## [370,] 0.935261517 0.7236270094 0.784584682 0.546540213 0.073784576
## [371,] -0.051945227 0.2680800118 1.661964100 0.486332006 0.621457720
## [372,] 0.936733664 0.0668307368 0.763320283 0.253115940 2.418547069
## [373,] 0.899450823 2.4743676064 1.763094393 1.676819191 1.043445319
## [374,] 1.326802996 0.6946572522 4.596799817 1.170989875 1.974995958
## [375,] 0.577745395 0.7958869333 0.937720009 0.202122588 0.467272550
## [376,] 1.485044236 1.0491896697 0.243730461 0.676580349 1.396486344
## [377,] 4.816984656 1.7815889425 1.000388724 0.681433997 1.579137803
## [378,] 0.592459573 0.0507250457 1.169906570 0.332446567 0.610583525
## [379,] 0.960614164 1.9648639870 1.292948740 0.123339288 0.039071239
## [380,] 0.648236626 1.6760382446 3.152525428 0.596182435 1.714308820
## [381,] 0.431502541 1.6696841626 0.819343209 1.206697257 1.397521812
## [382,] 0.302012539 0.5849401429 0.534759630 1.071609816 0.905062578
## [383,] 1.892663444 -0.0902082059 1.537465672 0.279091902 1.329520429
## [384,] 0.747741744 0.9644969110 0.875560163 1.245880458 -0.060303616
## [385,] 1.225675329 0.9040215851 0.230281304 0.169571721 0.819951186
## [386,] 0.698106315 1.0055528895 1.140579309 0.921313847 1.208081377
## [387,] 1.199329943 1.3504472496 1.997284763 1.289370644 0.345141027
## [388,] 0.984367033 2.5301076958 0.538044759 0.844204858 1.258825884
## [389,] 1.651275091 1.5419150758 0.811008354 0.983556179 0.207975604
## [390,] 0.899247026 0.4356385021 1.405723068 0.047687971 0.930999520
## [391,] 0.115751889 0.1835183787 0.564652308 1.255810444 0.294195590

```

```

## [392,] 0.303540873 0.3103832412 0.934448320 3.525558317 2.122935232
## [393,] 1.790278843 1.1965033888 1.573458639 0.100618705 0.844189973
## [394,] -0.053420416 0.3217953791 0.118839679 1.070585091 0.785308423
## [395,] 1.114846924 1.2273982585 0.797443858 0.696489480 0.212985074
## [396,] 0.264027241 1.6945645462 0.864392965 0.443693256 1.518535645
## [397,] 1.499208570 1.0283751207 0.766058950 0.535040054 1.440989069
## [398,] 1.045637540 1.2631695290 0.138068513 0.945165942 0.896071353
## [399,] 1.625868428 0.5893061122 2.737705647 1.151861238 2.846639592
## [400,] 1.567411345 1.2804240206 1.416175219 0.406751138 0.542849767
## [401,] 0.708239713 0.7950911086 1.496247487 3.358898698 0.840485849
## [402,] 1.100908420 0.9665089951 1.067712349 1.013049721 1.107830176
## [403,] 2.504629438 1.2152360126 0.721248660 0.218471709 0.441771483
## [404,] 0.547221780 0.3082948124 0.690404144 1.036318586 0.337100473
## [405,] 0.625565319 0.9342726641 2.008340136 1.886860935 0.617966996
## [406,] 0.597044486 0.2037453374 0.295976832 2.586690645 1.034619901
## [407,] 1.971329500 0.8952732629 1.839610959 2.252886450 1.049791472
## [408,] 2.308452644 0.2993897383 0.583889590 1.389884661 0.985585782
## [409,] 1.652912665 1.3691869103 0.609381994 0.690792772 0.259413819
## [410,] 0.647156262 1.2080361624 3.177731313 0.857938879 0.840555689
## [411,] 0.768620515 0.2313301012 0.878360844 0.853033174 0.910715500
## [412,] 1.506617506 0.6552919601 1.114039945 0.045231100 0.341595508
## [413,] 0.123765185 0.8851494893 0.797284215 1.706129462 1.429503729
## [414,] 1.340719296 0.7813547771 1.371787950 1.128288603 1.190968932
## [415,] 0.442621085 1.5485503257 2.125232963 0.079668690 1.594045630
## [416,] 2.587807662 2.2996324458 2.862402341 0.998316486 1.012975890
## [417,] 1.499374757 0.9283880383 0.890437604 1.148180068 0.058134639
## [418,] 1.446105004 1.3238197189 0.940097260 1.385132992 3.527386882
## [419,] 1.381830254 2.1823949337 0.728069788 1.823555563 0.458707839
## [420,] 0.632362865 0.1691419315 0.934556220 0.290945574 1.120891720
## [421,] 0.577092724 0.0988235419 0.248586750 0.846734091 0.344364548
## [422,] 0.572716026 0.4843964911 0.474508255 0.275508601 1.580637862
## [423,] 0.400728065 0.5648640115 1.026800281 0.041780241 0.704332544
## [424,] 0.784338426 0.5776489265 0.063943246 1.435936300 0.789857356
## [425,] 1.010325135 4.6179686693 0.448853052 0.211761256 1.206425907
## [426,] 0.288242447 0.3980588356 0.885978083 0.468368322 0.330108728
## [427,] 0.574568694 0.4029524177 1.688012889 0.242817196 0.310483813
## [428,] 0.345168801 2.3133696063 0.630146281 2.681714868 1.024061482
## [429,] 1.156640815 1.3259031598 0.819343841 0.552097967 1.334768455
## [430,] 0.346300524 1.0361907392 0.955610022 0.370830701 0.429997943
## [431,] 0.036261881 2.3990741556 0.556552582 1.601158944 1.525990903
## [432,] 1.693779405 1.2235897010 1.813744874 1.310145558 0.470705488
## [433,] 1.495721457 0.8513043373 0.529924661 2.271139895 1.326302075
## [434,] 1.781827357 0.3994316516 0.584277973 -0.195010189 1.010014931
## [435,] 0.487198397 0.8131406183 0.890115226 1.091573705 0.999275678
## [436,] 0.754629011 0.2303449121 0.993701047 0.250912876 0.312791165
## [437,] 1.130841888 0.3442492534 0.704099639 1.402128172 1.169655308
## [438,] 0.179004910 1.5149164687 0.465471030 1.279981613 0.995558066
## [439,] 1.285331128 0.6950383434 1.294305827 1.567120301 0.204772304
## [440,] 0.277406567 0.4412259562 1.725663317 2.198085122 0.821107867
## [441,] 1.227492968 0.1929852328 2.241512426 0.353981889 3.110185551
## [442,] 2.214112566 1.6618708025 0.539513245 0.425335756 1.108321459
## [443,] 0.481241857 1.0472402283 0.261605339 0.687898999 0.241556331
## [444,] 0.608906875 1.1813008552 1.206075232 2.118979846 1.776628742
## [445,] 1.161607185 0.8019665443 0.862471079 0.222243275 0.458361492

```

```

## [446,] 0.611983025 1.6357022244 0.394810011 0.469486425 3.708402038
## [447,] 1.870207531 0.5568476136 0.975408324 1.544070006 0.126310353
## [448,] 1.162452186 0.7423152266 1.236670228 1.773103496 0.415558062
## [449,] 1.968465829 1.0322447816 2.169826097 2.105639431 0.673032566
## [450,] 0.562682068 3.6800951403 0.665677997 0.801228458 0.308628901
## [451,] 0.058849016 1.5046489858 0.773902151 2.542372258 1.366882128
## [452,] 0.637665120 4.7391632980 0.996601986 1.487264023 1.093577926
## [453,] 1.382322981 1.7845627585 0.331424071 0.780472215 0.512695457
## [454,] 0.961072600 1.0952073786 0.880092032 2.072037790 4.778845072
## [455,] 1.208730035 1.7032702187 0.882255191 0.947672767 1.265318267
## [456,] 0.764469316 0.7421885149 1.471075229 0.201436487 0.447928841
## [457,] 0.162833758 0.5308220269 1.316783014 0.373380967 0.813502206
## [458,] 0.368266195 1.2512956191 1.136283683 0.808774608 1.777647052
## [459,] 0.222657194 1.2579489883 2.033832008 0.364013293 1.534170527
## [460,] 0.535534337 0.2904176554 1.088000436 0.603918207 1.102735978
## [461,] 0.803197258 0.0522562750 2.288148707 3.052629503 1.840438635
## [462,] 0.847025238 3.5922743439 0.498319111 0.666974730 0.423025413
## [463,] 0.607980408 0.2833568498 2.026955166 0.626006103 1.005951854
## [464,] 1.371043367 0.9292651075 0.694419837 0.401776886 1.600594801
## [465,] 0.967784196 2.5616626992 0.944891688 3.416426807 0.749068228
## [466,] 1.426727192 2.4542828451 0.764147704 0.421908624 1.146212588
## [467,] 0.308015979 1.4178665413 0.972999427 0.480141690 1.129150767
## [468,] 2.559607417 0.7416319919 1.840366522 0.987274940 0.858965668
## [469,] 2.277318804 2.1572798306 1.699672016 1.117520448 0.192477333
## [470,] 1.605430554 0.2915528562 0.096700115 0.661196706 0.625549795
## [471,] 0.032613918 0.6628671180 0.606671150 2.622364966 0.901663037
## [472,] 3.408546705 1.188888531 0.985546186 1.137228744 0.699568326
## [473,] 0.300582304 0.9791248646 0.519480970 0.371862697 0.909364592
## [474,] 2.320115779 1.1898669444 1.134510820 1.309459743 1.565270434
## [475,] 0.723576628 0.4199678374 1.028322010 0.162777003 0.355082835
## [476,] 0.575362127 1.5779181701 0.761911082 0.731030263 1.058740974
## [477,] 0.914643442 1.0183181895 0.837334081 0.352044700 1.412117995
## [478,] 0.364108959 0.4047255780 0.524360672 -0.016364540 0.538313806
## [479,] 0.534860563 0.9946210826 0.522924408 0.735024121 0.712780792
## [480,] 1.595059473 0.2435670144 0.233312698 1.822881914 0.788101944
## [481,] 1.445741569 0.6645385265 0.286136818 1.270765059 1.425403064
## [482,] 2.234981988 0.3049015667 1.572046846 0.953060011 0.224976787
## [483,] 0.831236838 0.8695905880 4.070455767 1.156442354 0.414950783
## [484,] 0.404022537 0.4311915951 0.147429202 0.157679108 0.996026811
## [485,] 0.580166916 2.9493749328 1.706852306 0.519313800 1.064419978
## [486,] -0.036674891 1.1815879886 0.332618113 1.609110276 0.134158171
## [487,] 2.528089755 0.6272354730 1.499072251 0.555044847 0.839453187
## [488,] 0.725698014 0.5039857899 2.487986892 0.231211799 0.730418508
## [489,] 1.945360304 2.1641314763 2.738282115 0.772868472 1.069002631
## [490,] 0.641991406 1.1176086653 0.769118813 1.459180136 0.511798828
## [491,] 1.645888696 0.4164088600 0.497664026 0.938638060 0.326102434
## [492,] 1.653437794 0.5614059922 0.768737215 0.771541009 1.496878098
## [493,] 1.029406191 0.8440021374 0.261634811 0.520155101 0.222398503
## [494,] 0.441514176 0.5241363978 1.464667731 0.467060763 1.661703273
## [495,] 1.348462722 0.7415393955 0.441455146 0.525483281 0.168272200
## [496,] 2.076151942 1.1402158932 1.220117856 2.075633587 0.384293710
## [497,] 2.151844404 2.6289104157 1.232804094 1.158274357 2.338694880
## [498,] 0.754675833 0.6370126390 2.027398801 1.252703704 2.797842074
## [499,] 1.109245227 0.8715166258 1.237377753 1.132387617 0.629557572

```

```

## [500,] 2.182052687 1.2844754225 0.914992449 2.358777846 1.043473381
## [501,] 1.101713330 0.6717195882 0.581186727 -0.009746566 3.717068489
## [502,] 0.462446758 1.8179925559 1.170611368 0.283339249 0.123670913
## [503,] 0.288018726 1.6070959905 0.151133450 0.786265958 1.423033398
## [504,] 0.108220918 0.2372898020 1.378974647 0.735784005 2.075389042
## [505,] 1.163561074 1.0487786904 0.269837321 1.235602392 1.288449865
## [506,] 1.246768207 0.8110472995 0.838613061 0.257376570 2.741642073
## [507,] 0.724827324 0.7617976951 0.804777052 0.980178768 1.662948738
## [508,] 0.155038816 0.7758041169 1.931808573 1.148594487 1.214654471
## [509,] -0.025437231 1.2279500385 0.283243201 0.196318015 0.866370653
## [510,] 0.255401933 0.6707397815 0.966363052 0.485335729 1.676769249
## [511,] 0.780018278 0.7059541558 1.299685196 0.754294217 1.887730095
## [512,] 0.181865800 0.1423733793 2.704146695 0.677552084 1.271484897
## [513,] 0.986869373 2.8388145302 0.943105195 0.897922091 0.753520266
## [514,] 0.459383830 0.8521688914 0.428107063 0.854646131 0.505492723
## [515,] 1.109431961 0.2556593319 1.394471865 1.071809323 0.545621487
## [516,] 1.369340370 0.5465159442 2.252153001 1.698412986 0.057419451
## [517,] 1.174895478 2.6204110970 1.354147831 3.314163264 1.417233341
## [518,] 0.713136509 0.3151030484 1.876718541 0.795133193 1.470257310
## [519,] 0.864899588 0.8185286118 0.372851181 0.944885081 0.623857155
## [520,] 0.764722170 1.4134931114 1.793566276 0.594601474 0.810063811
## [521,] 2.149708087 2.3986017579 1.062509727 0.757042387 1.223748067
## [522,] 0.280997331 0.8379399025 1.109698689 0.906370807 0.474946577
## [523,] 0.553469558 0.7393920493 0.676105207 0.697836610 0.326002187
## [524,] 0.016158783 4.7592192152 0.646930683 1.101475848 0.323726196
## [525,] 0.823865399 1.8210365956 0.441724221 0.648551576 0.514948334
## [526,] 2.033777458 0.5627289211 1.275679235 1.174413906 2.059048053
## [527,] 0.273656619 1.2303566976 3.020554940 0.991504417 2.526496201
## [528,] 0.023073281 0.5896854092 0.282412605 1.935023579 0.454668704
## [529,] 0.898313662 1.3241724546 1.143267936 0.305144344 0.468749839
## [530,] 0.972631409 0.4487412212 0.698881640 0.406433751 0.532137315
## [531,] 1.681343344 1.5374666172 2.144784034 0.014319848 4.722719838
## [532,] 1.926150252 0.3680409288 1.092520677 0.966231202 1.029302352
## [533,] 0.289250057 0.9330709094 1.168068172 0.372007507 0.631131799
## [534,] 0.929791841 0.7549056413 1.568572632 1.269486883 1.330610416
## [535,] 0.709603639 0.7744653300 3.129143890 1.147083687 1.116450975
## [536,] 0.872001542 0.5731005690 2.455130952 1.391592826 0.604772097
## [537,] 1.503502543 0.8681708191 0.607180498 0.332624118 0.936261757
## [538,] 0.180117547 3.0141364726 1.299595603 2.784380911 0.813752395
## [539,] 0.301521455 0.4072872438 3.643209791 0.281077984 0.208308321
## [540,] 0.672932136 1.2388076367 1.686419685 0.731472767 0.268100142
## [541,] 1.161197692 1.0455891912 1.082146630 0.898415798 2.284573952
## [542,] 1.901146540 2.9237136647 0.923049564 0.739336338 0.505200493
## [543,] 0.883384714 0.8410317637 0.339511416 0.851932961 1.081336961
## [544,] 1.009486946 0.3690417486 0.270341586 0.671180763 2.378876118
## [545,] 2.563909724 1.3523342265 2.199276431 1.610087825 1.330584594
## [546,] 0.672607780 0.9869148541 0.562924922 0.620533750 0.531878972
## [547,] 1.251072336 0.9684142256 0.865740458 0.815499600 0.403588240
## [548,] 0.401922362 0.2133942715 0.351565696 0.630403020 0.725304540
## [549,] 0.741613455 -0.0709457795 0.612707466 1.471689151 1.223405028
## [550,] 1.602368882 0.7896768937 0.394041038 0.774396603 0.844357056
## [551,] 1.169991560 1.9925548309 2.010400473 1.603883971 0.385128930
## [552,] 0.440869599 1.7357305167 0.626776096 0.826216843 0.713318144
## [553,] 0.399756827 1.7264565850 1.949280355 0.333508655 1.000704398

```

```

## [554,] 0.971550241 0.6043784100 1.541752381 0.216426483 1.075311525
## [555,] 1.880456297 0.7896919967 1.636410133 2.241001667 1.207394858
## [556,] 1.059788356 1.7251694024 0.412127516 0.996126668 0.602046373
## [557,] 1.075550574 0.1241562027 2.504523626 0.472512821 0.835062391
## [558,] 0.562029588 2.6232246779 0.783784698 1.650213351 1.118925458
## [559,] -0.049860720 0.4406376934 2.423981705 0.719652798 1.172614929
## [560,] 0.040822897 1.3009324581 1.015964903 1.298781505 4.201419430
## [561,] 1.002814005 1.6446619484 1.278374158 0.161879603 0.420778463
## [562,] 0.474513517 0.0024243054 0.238658206 0.309186842 1.277512843
## [563,] 0.954077010 2.2982522194 2.514303241 1.231721363 0.911274061
## [564,] 0.292717688 0.0892641815 2.803540630 0.799562485 0.273780953
## [565,] 1.973229324 0.8547081928 0.701247804 1.223893729 0.242258338
## [566,] 0.974362670 1.0616142195 1.335073787 1.338246666 1.269254749
## [567,] 0.580845121 1.8639526326 1.047109819 0.504893126 0.648648267
## [568,] 0.211491812 0.4921584600 0.093566340 0.530369853 0.884461895
## [569,] 1.175770090 0.8254187211 0.524226029 1.307866184 1.574475821
## [570,] 0.237714490 0.7910465234 0.839682064 0.078986244 1.450257254
## [571,] 1.099852184 1.0157938349 0.341045808 0.801700434 1.784401329
## [572,] 1.604307441 1.2989458224 1.329819141 0.188495831 0.443445013
## [573,] 0.870743678 0.5798413334 0.611394654 4.017751725 1.421152115
## [574,] 0.907366109 0.4074741701 0.345859135 0.761391326 1.005132458
## [575,] 1.123784916 1.1287760565 0.542235533 1.055871505 1.060364471
## [576,] 1.365897899 0.4014122242 0.216462546 0.657311650 0.680347966
## [577,] 0.900255385 0.5350571224 0.302198260 0.938363095 0.269844853
## [578,] 0.555105028 1.5971943821 0.571596906 0.725554103 2.216627079
## [579,] 1.782941114 0.8963536336 0.971578950 0.740803311 0.496134488
## [580,] 0.959777125 1.0443172851 1.620404743 0.718116320 1.020995608
## [581,] 2.448955750 1.0277203099 0.413748832 0.041436293 0.670282372
## [582,] 1.026493784 0.5047745520 0.446284860 0.061802395 1.274313426
## [583,] 1.058705072 0.7244889180 2.059898086 1.004663241 0.336857806
## [584,] 1.162012550 0.8419313804 1.073589347 0.504936629 4.131522485
## [585,] 0.371062584 2.0814114312 2.059029235 1.445798349 0.679744557
## [586,] 0.610695180 0.6118871457 1.700542053 0.636165897 0.826459759
## [587,] 0.761609210 1.4296844792 0.370851873 1.669077485 0.519766701
## [588,] 0.169584215 0.0624505447 0.664715991 0.657027237 0.738744792
## [589,] 0.926065736 0.8021506625 0.190860125 0.120902707 0.579050943
## [590,] 0.635339881 1.8829421655 1.876108404 1.429860134 0.369431090
## [591,] 0.809023995 0.5898269768 1.862444468 1.263069874 0.118641790
## [592,] 1.815371435 0.5721092942 0.966184731 1.327781251 1.365901039
## [593,] 0.991055990 0.5441958219 0.358880705 0.855823631 0.342507861
## [594,] 0.437349706 1.6129202369 1.784991097 0.508716407 0.576375507
## [595,] 1.108756264 2.0409511827 1.463530684 0.211896213 0.391048827
## [596,] 0.531982700 0.4849387803 0.392597472 0.920027851 1.784431269
## [597,] 0.728391666 0.1573112793 1.219574613 1.569375636 0.858764139
## [598,] 1.598893754 1.1375773958 1.279869385 1.316076466 0.298170497
## [599,] 0.652651883 0.6098147584 1.937886084 1.208195595 0.723424156
## [600,] 1.974481451 2.2779628872 0.500215591 0.868486013 1.950128296
## [601,] 0.592126715 0.9093681537 1.002007965 0.492954071 1.229924153
## [602,] 1.737562346 0.8167265697 1.299896252 0.884125603 1.242863706
## [603,] 1.948961653 1.1512139661 1.124113069 1.300517063 0.358315383
## [604,] 0.928905972 0.6643069857 1.845641118 0.532327421 0.837400478
## [605,] 0.455789913 1.0752988129 0.377147041 1.563642979 0.292662127
## [606,] 1.810420798 0.7146865856 0.023474763 0.324959512 0.471366960
## [607,] 1.791021514 1.3352676519 1.778542331 1.455612941 0.618854286

```

```

## [608,] 0.723983659 1.4579934002 0.631033953 0.234722805 0.675548864
## [609,] 1.509249869 1.7830650062 0.981825606 2.027759290 -0.296349275
## [610,] 0.772330059 0.7874183023 1.938271428 2.009931499 0.176101938
## [611,] 0.545315097 0.3036637599 2.506307106 2.386240146 0.976298120
## [612,] 2.308329601 0.2788191358 1.754489306 0.730950645 1.322600794
## [613,] 1.093592521 1.1666551101 0.118341908 0.783296175 1.827534810
## [614,] 2.022988732 1.2543975332 0.735661502 0.536709837 0.607571854
## [615,] 0.862151367 1.4495317008 0.605643903 0.726805623 0.164927617
## [616,] 0.778964645 0.7173195319 0.387850032 1.377990054 0.474433135
## [617,] 0.959366442 1.2176667604 0.431685827 1.796732346 0.515681455
## [618,] 1.658803085 0.8860677270 1.459517402 1.657883753 1.764806379
## [619,] 0.366210044 0.2144020270 -0.003862854 0.282331281 0.789955692
## [620,] 0.147239129 1.3483076166 1.678583941 2.830478795 0.148351114
## [621,] 0.667162644 0.9477180997 0.723212868 1.349112332 1.497931285
## [622,] 2.108355028 1.6009281372 2.020556333 0.193660682 0.542677826
## [623,] 0.189434195 0.8065251559 0.764074270 0.434533220 2.417958167
## [624,] 0.457898805 1.3701912538 0.639707566 2.436629999 0.130027253
## [625,] 2.076406322 1.2371429903 0.592662750 0.332526647 0.303521068
## [626,] 0.193743043 0.4386701326 0.549933568 0.820363286 1.224476612
## [627,] 0.543279637 1.3011084500 0.682760207 0.422232751 0.343803586
## [628,] 0.450084225 0.7934748500 0.941912808 1.672550640 0.801825255
## [629,] 0.164299836 0.6230981918 0.110109323 0.439175331 0.866388050
## [630,] 0.003721863 2.4390978947 3.388827631 0.571294542 0.535591261
## [631,] 1.232684061 0.9338105205 1.444187136 2.385892462 2.395060657
## [632,] 1.575104442 1.1068498209 1.076476172 1.821727635 0.180188565
## [633,] 1.370231140 0.5856006484 1.197330500 0.526633693 0.592484405
## [634,] 0.439909042 0.5392665643 1.552315996 0.585943077 1.288359080
## [635,] 2.730643110 0.7084330554 4.359702761 0.402067530 0.502127633
## [636,] 0.570412020 1.3246505675 1.184766383 0.523424906 0.919053212
## [637,] 1.194219346 2.5324148727 1.486470626 2.332418631 1.382179946
## [638,] 0.053451813 0.1024270241 1.016135267 2.824485989 0.473605675
## [639,] 2.016837480 1.2746215105 1.822794902 0.426804239 0.045833923
## [640,] 0.972940907 0.0046908528 1.234025627 1.593384516 1.850591411
## [641,] 0.912995391 0.4966558769 0.737084894 0.471907672 1.274958937
## [642,] 1.357577618 0.2393639248 0.481297170 0.775869704 1.901877869
## [643,] 0.013560798 0.9645198318 0.998611351 1.373585931 3.728819016
## [644,] 0.626168641 0.8265193441 0.937163867 1.265621033 0.210243476
## [645,] 1.298277506 2.1498378389 1.274393244 0.150218958 0.694815496
## [646,] 0.716658317 0.5566698146 1.319484647 1.402080500 0.618471085
## [647,] 0.556283301 2.0976547663 0.761221593 0.638742666 1.830895996
## [648,] 0.554647162 0.3229121193 0.850915740 1.224041846 1.039586398
## [649,] 2.104822556 1.3294901704 0.875722228 0.485882248 3.178283095
## [650,] 0.681368588 1.4540204506 0.520304993 0.626105606 0.316090200
## [651,] 1.953400512 2.2572435381 0.118715164 0.211356295 0.329471114
## [652,] 0.730218270 1.4841202510 2.209050999 0.601668804 2.025366084
## [653,] 0.323442527 1.5867078587 1.329513439 1.301165479 0.824815367
## [654,] 0.948352590 0.6009667004 0.440958295 0.823224098 0.333656552
## [655,] 0.242462321 1.0952789149 1.947209765 0.498487961 0.416176828
## [656,] 0.942466478 1.9228383746 0.878668550 0.510529054 0.625645234
## [657,] 1.475954528 1.1677533184 2.242797084 0.056538617 0.277134698
## [658,] 0.722553850 0.9636806024 0.937460921 0.099598314 0.664877114
## [659,] 1.313605188 0.4945333130 0.784023786 2.242771034 0.303882966
## [660,] 1.846598129 1.8462648258 0.450247512 2.788481909 0.378833576
## [661,] 0.261150373 1.5140191631 0.990585698 0.864533255 1.476802072

```

```

## [662,] 0.524756783 1.8638772223 0.887919662 0.148922384 0.200815542
## [663,] 1.149149646 0.8729575510 1.020838581 1.292285358 1.473040961
## [664,] 1.398964021 0.7357460631 0.447384533 0.577811201 0.507987099
## [665,] 1.834124426 0.6957912750 2.119572179 0.882083806 0.610003901
## [666,] 0.542501436 0.6172496308 0.041239091 1.084202740 4.925492884
## [667,] 0.974834067 5.5648135814 2.471121036 0.611988204 1.843047757
## [668,] 1.952592092 1.0233574624 0.849631858 0.607718315 1.276278703
## [669,] 1.000847461 1.8914447338 0.339549677 0.427547702 1.043400779
## [670,] -0.044836950 0.3897250789 0.623721080 1.072992404 1.450072623
## [671,] 0.733381147 3.1744433326 1.956710383 0.347870264 1.312281588
## [672,] 0.322597454 0.7530332153 0.365148441 0.713904469 0.316571921
## [673,] 1.524466648 0.8370447547 2.576661696 0.423186579 2.143574787
## [674,] 0.703402447 0.6936965573 0.637467848 0.500558223 0.664831040
## [675,] 0.271016956 2.1998173042 0.867905437 -0.025732088 0.165387123
## [676,] 0.520651105 1.3200401577 0.947275313 0.740827028 1.176874335
## [677,] 0.546843314 0.8951637859 0.466384740 1.156749893 0.769540108
## [678,] 0.323908515 1.4744578401 0.652879059 0.341931194 0.367099706
## [679,] 1.310551662 2.3205197362 1.731528669 1.923386566 1.206634465
## [680,] 1.329444621 0.9702138724 3.096238667 0.832096803 0.404430147
## [681,] 0.490915418 0.7099175276 2.262087820 0.280702763 0.383008808
## [682,] 0.449753640 1.0828682543 1.496603785 0.738011233 1.537793216
## [683,] 0.571466492 1.3324291558 1.900164964 2.572109029 0.321529699
## [684,] 0.971245194 1.0214323006 2.227893956 1.051297042 0.399397438
## [685,] 0.812281242 0.9290938916 1.023854387 1.759485405 0.213687928
## [686,] 0.516528401 0.8443930094 1.507977708 0.532816286 0.978719544
## [687,] 0.304734355 0.6813553545 0.393951058 0.955775129 1.600101444
## [688,] 0.126184874 0.4821329293 0.716385292 1.167787867 1.607696826
## [689,] 0.681559842 0.8569331603 1.105107876 0.891778980 0.124718921
## [690,] 0.385910833 0.3583272069 0.575413528 1.580779580 1.973764176
## [691,] 0.489114766 0.9834496969 1.610512399 1.480449900 2.014025815
## [692,] 0.236646068 1.0471191403 0.444215779 2.037331721 -0.041091088
## [693,] 1.083707413 1.1359323082 2.408824335 0.352510052 0.713672033
## [694,] 0.662453400 0.9077196102 1.445998046 2.356842448 2.115323080
## [695,] 2.649353936 3.4437974857 2.945360152 2.351537262 0.512960934
## [696,] 1.903741732 0.8931491555 0.320304333 2.390209607 0.065103992
## [697,] 0.703558082 0.8637563585 1.130107627 1.327162492 0.314872620
## [698,] 1.352858159 1.2306991679 0.725483884 0.434440959 0.688666031
## [699,] 2.641804264 1.4535692085 0.687223234 1.406780965 2.009924658
## [700,] 0.434845620 0.8594286731 0.161540639 0.444874696 0.511146698
## [701,] 0.808749631 1.0389929227 0.692700440 0.840169285 0.569285416
## [702,] 1.570397999 0.5537870631 1.193478927 1.849926022 0.831343078
## [703,] 0.554234191 0.9589619483 1.016998603 0.464955939 0.660364870
## [704,] 1.650371676 1.7268696898 -0.067851777 2.110176560 0.173845117
## [705,] 1.649778289 0.0803254925 1.663582461 0.600491716 0.557467787
## [706,] 1.528905472 2.5041924845 0.746612952 0.638995073 1.724056158
## [707,] 1.031640040 0.4525755532 0.612741760 0.916027737 1.282515133
## [708,] 1.381234093 0.3256267623 3.430263386 1.223258317 2.232945554
## [709,] 0.306135987 1.4804672429 0.601943551 0.520627540 0.348197584
## [710,] 0.505617610 0.6792751946 0.650641063 0.135994657 1.124496909
## [711,] 3.662237132 1.1892326073 0.836166096 0.816561235 1.044225769
## [712,] 0.313613546 0.9039115224 0.648864538 0.309513461 1.013100260
## [713,] 1.317164909 0.1547604565 0.552846126 0.804742467 1.208118078
## [714,] 0.457084896 0.0422641091 0.150872705 1.715310649 0.321400996
## [715,] 0.137721770 0.5074159541 1.556478395 0.579912324 0.370157291

```

```

## [716,] 0.774061339 0.5300132888 2.455789255 0.400529532 0.022010709
## [717,] 1.966880551 1.3145928945 1.582283099 0.219327999 1.143501178
## [718,] 0.616172239 1.5636356050 1.690889584 1.125992827 0.402338999
## [719,] 1.067570064 2.4863513732 0.841853585 0.255840491 0.664269555
## [720,] 0.988830181 1.8369739695 0.722533007 0.601669087 0.827643103
## [721,] 0.519781636 0.5640267725 1.175337804 1.517527913 0.216853636
## [722,] 0.935824401 0.2613091708 0.362822000 2.811795813 0.835280521
## [723,] 0.371305923 0.4179436717 0.312823232 0.779046666 1.057054004
## [724,] 1.373126277 0.4802153960 1.344865506 0.844523305 0.339611201
## [725,] 0.412631961 0.7052182315 1.702286832 1.221623218 0.715328987
## [726,] 2.806425030 2.4826202743 2.054594007 0.420121165 0.475095585
## [727,] 0.519547282 0.6417241269 1.198354869 2.051977723 0.178331766
## [728,] 1.108606711 0.3279646869 0.279459746 0.734443037 0.785569890
## [729,] 2.087148062 1.1929071617 1.914675735 0.931937217 0.299520281
## [730,] 0.856587935 0.5917873990 1.106929525 0.989282277 2.544334778
## [731,] 1.058877909 1.8811021785 2.859127001 1.527571680 1.582245185
## [732,] 1.916796631 1.7061629594 0.440250426 1.648977623 0.861987395
## [733,] 0.159806428 1.2732113659 0.313643212 0.302198625 0.830662962
## [734,] 0.882427081 0.5988646301 0.625699187 0.033006930 3.755795281
## [735,] 1.367091704 1.4097851496 0.460764860 0.473390522 1.011361589
## [736,] 0.590739759 0.3454001404 0.685350418 0.172135985 1.093150705
## [737,] 2.105103029 0.7057828723 1.287837474 2.268407209 0.257330034
## [738,] 0.792559265 0.8094483740 0.421935758 1.040515740 0.753643166
## [739,] 0.439513849 0.5161304847 2.331779148 0.427566540 0.548014424
## [740,] 1.600983425 0.7376774899 0.147197075 0.265202759 0.448210906
## [741,] 1.736393971 1.1876741181 1.975253124 1.270189369 1.500268482
## [742,] 0.539017471 0.5493486825 0.876821692 0.355304224 1.273782400
## [743,] 0.565249947 0.6011212452 1.592212255 1.761411471 1.032467911
## [744,] 1.148838228 0.3716524877 0.473979852 0.183883020 1.565710448
## [745,] 2.017041799 0.2708997247 3.463496512 1.259639228 1.786911886
## [746,] 0.104140768 1.3198070714 0.567093213 1.072195267 1.464692862
## [747,] 0.705650884 0.3118533412 1.566105865 0.919923500 0.333866377
## [748,] 1.661385306 0.5979043089 0.610792521 0.660459692 1.010629854
## [749,] 1.449256294 1.0133117258 2.001675074 0.294737072 0.447858414
## [750,] 2.304802566 0.9053287539 1.182965506 1.063725030 1.579701682
## [751,] 0.965329992 0.7707660429 0.593057468 1.593676233 0.915876491
## [752,] 1.451785117 0.8624618115 0.905281557 1.126521486 0.181815443
## [753,] 1.326450761 0.8555390787 0.484564548 1.467088981 0.536598345
## [754,] 2.569488467 0.2101666508 0.388773509 1.897868097 0.731714766
## [755,] 1.257146414 1.2603645494 1.019868670 0.682277159 1.178590853
## [756,] 0.508736565 0.7768918598 0.958515246 1.265060003 0.712163056
## [757,] 0.331473089 1.1966422091 0.728065047 0.170225652 1.130671268
## [758,] 1.300387953 1.6499559733 0.748674786 0.869153070 0.647209193
## [759,] 0.667316074 2.0529731438 0.782055457 0.449700090 1.061361391
## [760,] 1.702054611 0.6347817704 0.192081846 1.282177854 1.410271526
## [761,] 2.960788434 1.4711172899 0.538078349 1.404864935 2.932441486
## [762,] 0.718283563 0.5081593979 0.479589194 0.343043928 1.118771933
## [763,] 1.441412311 1.8299703271 0.213406469 0.492313555 0.685941758
## [764,] 0.477792124 0.2813006996 0.329769049 0.096800165 0.382618429
## [765,] 2.183613929 0.9206470381 1.492626457 1.744434721 1.029039560
## [766,] 0.425407395 1.5967669645 0.546892536 0.760037328 1.827087739
## [767,] 1.185326987 2.2179509661 0.564530454 1.514242608 1.418391814
## [768,] 0.294103506 0.9378752451 0.580969394 1.222899084 0.873262755
## [769,] 0.225260117 2.2919300395 0.137920786 0.280756903 1.214708498

```

```

## [770,] 0.364798412 0.0895079475 0.681082109 0.064105088 0.696128572
## [771,] 0.229896844 0.5192013799 0.311611995 1.449490662 0.687522361
## [772,] 0.451683265 1.4965282206 1.181898869 0.843015034 0.267001402
## [773,] 0.121539147 0.6743459586 0.524974905 0.503427865 1.208843135
## [774,] 0.615235479 1.1546915351 1.504949847 2.408330311 1.295230422
## [775,] 1.449131417 1.7458286963 0.459499514 1.105483900 0.509823021
## [776,] 1.372946733 1.1839582659 0.315773937 1.444665827 0.693271530
## [777,] 0.923177376 0.8900183130 0.520866597 1.001699578 0.691226164
## [778,] 1.496690033 0.6013407122 0.522437288 0.443684624 1.631289584
## [779,] 0.500588457 1.9994840968 1.967833175 0.633809900 2.222840574
## [780,] 1.718543467 -0.0271617931 0.531139183 0.472352503 1.712265005
## [781,] 0.866038038 1.1984164298 1.666810114 0.826198710 2.110158985
## [782,] 1.088348185 0.5275664064 0.331905354 0.921294129 0.984824020
## [783,] 0.309589858 1.3473015903 0.821459346 0.579099949 1.110320307
## [784,] 0.575537740 0.8585707353 1.404503590 0.724911310 1.559262946
## [785,] 2.951396501 1.0909558717 0.447188612 0.666631775 1.061299473
## [786,] 1.607546938 1.4037298065 0.501838281 1.100237425 0.645029688
## [787,] 1.015841686 1.7060196885 0.840377977 2.880469751 1.482541987
## [788,] 1.498374928 0.8706173056 0.638313503 2.572425240 0.627719650
## [789,] 0.751311817 0.6463046777 0.703528802 0.198055274 1.035483243
## [790,] 1.439586209 0.4868959166 0.330623159 1.098096205 0.336681939
## [791,] 1.888502534 0.9260405282 1.312960225 1.306952338 0.529552072
## [792,] 0.764187554 0.4531359792 0.215292628 0.621915935 0.782952045
## [793,] 1.676947598 0.3858177119 0.335377503 1.137882894 1.129856583
## [794,] 1.287865657 1.3785558157 1.102823227 0.756482836 0.072326497
## [795,] 2.665527648 0.7479319189 1.002472991 2.149668365 1.016632334
## [796,] 1.241215824 1.1454550387 0.835325729 1.742903833 0.871892119
## [797,] 0.975299061 0.62666621246 0.868161350 1.578518788 1.049436552
## [798,] 0.029617779 0.5095089149 3.105146332 0.708364972 1.588312231
## [799,] 1.037047194 0.6713331914 3.306860150 1.149946685 0.846347393
## [800,] 0.217170796 1.5050344938 1.137376110 0.663426311 1.030167277
## [801,] 0.248075080 0.6292059252 0.685718506 0.406883095 1.004119200
## [802,] 0.788436023 2.1800517083 1.270249537 0.947098539 0.658524421
## [803,] 0.294505441 -0.1228660330 0.939333840 1.043862692 1.203951343
## [804,] 0.842029783 1.8738238513 1.333759881 -0.013561056 0.596908035
## [805,] 1.172203176 0.3034769593 0.846843433 0.841536266 1.353372491
## [806,] 0.658126378 0.6051414597 1.431154098 1.048379688 0.591653963
## [807,] 2.138194186 1.1874711810 0.957419580 1.708760213 1.046319573
## [808,] 0.558965210 0.8788065328 1.792930364 2.796470283 1.212345472
## [809,] 2.677868229 1.1857768767 1.779281193 1.873666852 1.441442208
## [810,] 0.397715980 0.7985036896 1.633168966 2.457109333 0.931653853
## [811,] 0.972677289 1.0935120295 0.689691201 0.929953495 0.011701591
## [812,] 1.398099506 3.2771203388 0.716164238 0.467113400 0.998813353
## [813,] 0.708212360 0.0464209810 1.960052679 0.806922450 2.002120622
## [814,] 0.871389307 1.4051051863 1.871621808 0.423611169 2.343585562
## [815,] 0.368657638 0.7506398745 1.865170908 1.649134013 0.741909340
## [816,] 0.585137825 0.2318848304 1.864694984 0.427320595 0.342495409
## [817,] 0.510262729 1.8898360801 1.064407660 1.158417234 1.998722448
## [818,] 0.815992967 1.3333881277 1.612154371 0.568381755 1.394058302
## [819,] 1.238094125 0.4911530422 1.198974222 2.868020990 0.677786044
## [820,] 0.571841022 2.8941463917 0.676025877 1.319810878 0.688241690
## [821,] 0.399675613 0.3769281582 1.048817453 0.671341235 1.389499074
## [822,] 0.674808637 0.6860462093 0.441155039 2.637380304 1.401569931
## [823,] 0.184387832 0.8714157469 1.538766387 0.623111509 1.498453811

```

```

## [824,] 0.556128620 0.0739109605 1.618735595 1.578200641 0.554713382
## [825,] 1.145574707 0.8804511110 1.290617698 0.677402585 0.654321123
## [826,] 0.949424260 3.4697232162 1.038530871 1.157105876 1.580755289
## [827,] 1.899675206 0.0548938170 -0.048632187 0.442166593 0.919019660
## [828,] 1.154959823 1.5297089879 0.156872890 1.549787784 1.303515331
## [829,] 0.554563767 0.6736897184 0.444755419 0.538448321 1.626821443
## [830,] 0.687277693 1.5484661251 3.002964071 0.738120605 0.822197805
## [831,] 0.282032339 1.1279374708 0.174958998 1.013421513 0.239569232
## [832,] 0.852977083 1.8028069278 0.599296199 0.867534862 1.548349481
## [833,] 1.429911128 0.7196089480 2.601991521 1.161432811 0.577427559
## [834,] 1.609271387 0.3972257589 0.484706336 1.294978761 3.320085912
## [835,] 0.891388455 1.1296347133 1.942230523 0.022632225 0.664889095
## [836,] 0.847229152 0.2907245962 1.762185691 4.342079437 1.135175411
## [837,] 0.989043988 0.1772217476 0.494402522 2.374823073 1.090002596
## [838,] 0.433664983 0.3334314582 0.313433947 0.484135726 0.821726798
## [839,] 0.612170230 0.4790172733 0.555835435 0.765335602 0.374404911
## [840,] 1.539532663 1.4959272755 0.286426252 0.801644438 0.419159706
## [841,] 1.011168328 1.5296122804 2.055054655 1.478041138 0.918352048
## [842,] 0.279377510 0.7118881964 1.000279913 2.241488466 1.053849574
## [843,] 0.999957167 0.1394242366 -0.132049883 3.913260829 1.217404580
## [844,] 1.506740368 0.6133520756 0.989291284 1.546190453 1.372989289
## [845,] 0.997188579 0.8370842336 1.211358252 0.608454046 0.754498861
## [846,] 1.314428868 0.8772875468 3.347125442 1.007013708 0.354302277
## [847,] 3.279623633 0.3878655287 0.876624567 2.218611440 1.140339358
## [848,] 0.705731106 0.9062275356 0.742608938 1.628042999 0.971236489
## [849,] 1.091347354 0.1983321308 1.893678871 1.015951769 1.199775371
## [850,] 0.586153348 1.0729051707 0.484921244 0.229902018 0.654467184
## [851,] 1.492577643 0.5474859421 1.725989204 0.172537730 0.798476578
## [852,] 3.798305031 0.6671675990 0.893729284 0.075201239 0.110609641
## [853,] 0.988867772 1.6723384301 0.532347109 1.795103773 1.208195366
## [854,] 0.397158497 1.2529708924 0.514978854 0.647423685 0.912334879
## [855,] 1.438349610 0.9372373981 0.495965064 0.935023108 0.550925461
## [856,] 0.761246682 0.6567028358 1.942598096 0.912736888 0.567885199
## [857,] 0.607839657 1.0470201591 1.456536038 0.662297677 0.526721836
## [858,] 0.867807645 0.7135178267 0.634124749 0.427703346 2.274650481
## [859,] 0.647843609 0.4920222405 1.431172463 0.377303394 0.587326688
## [860,] 0.537915087 0.8078615435 0.393987230 0.468695635 0.171750224
## [861,] 0.411367276 0.3402537108 0.571051389 0.338914283 0.358545025
## [862,] 2.558141316 0.7815489290 0.504758427 0.698100371 1.307247011
## [863,] 1.947352679 1.6363550689 0.648032568 1.675700573 0.551480073
## [864,] 1.037967554 0.3622248285 0.584630202 1.601227692 0.750229667
## [865,] 0.864210889 0.8782076788 0.102074295 0.032679020 0.565518752
## [866,] 0.879217279 0.5746572955 0.697406665 0.210958169 0.214275128
## [867,] 0.7777762689 1.7491042334 2.734475581 0.872266761 0.784016967
## [868,] 0.272556049 0.8147112625 0.267563208 0.323530280 1.577342084
## [869,] 0.834414187 0.2006508791 1.396942921 0.676089851 1.056287477
## [870,] 1.270467874 0.9653664058 0.131404761 1.759439552 0.618051218
## [871,] 0.602480089 0.6006585721 2.210166256 0.598936505 0.827199346
## [872,] -0.086197902 0.5976718025 0.465233472 0.722380268 0.907894388
## [873,] 4.038494066 1.0867200760 2.072690032 0.195457914 0.956201329
## [874,] 0.935556783 0.2107608772 0.973550456 0.541177992 2.089717068
## [875,] 3.488196551 2.0674123482 1.162474672 0.807806446 0.004546541
## [876,] 0.910890073 0.5355432693 0.182276096 1.098112157 0.424966644
## [877,] 0.123678047 -0.0159873024 0.697873459 1.802850597 0.302208838

```

```

## [878,] 2.116979045 2.2034398622 0.889618818 1.910255936 1.980703126
## [879,] 1.663198751 0.4098635236 0.196365072 0.758751715 1.046304503
## [880,] 0.239207586 0.3948076992 1.727865899 1.113089630 0.459949794
## [881,] 2.250213334 0.3515031448 1.276046880 1.689895485 0.689080189
## [882,] 1.565620142 -0.0193337772 1.109099886 2.615047070 1.605143693
## [883,] 0.395054607 0.7402730339 1.223967252 1.147453070 3.032028551
## [884,] 1.186931120 2.2821725429 0.670428793 0.668603476 1.035191909
## [885,] 0.943096246 0.8572145735 0.453556702 0.916812309 1.638766895
## [886,] 0.435995863 2.2039673758 1.094957296 0.342315857 0.551562236
## [887,] 0.576976850 0.6801389522 0.864863846 0.826869120 1.025538390
## [888,] 0.269259856 0.3081727774 0.400460565 0.500068883 0.709251606
## [889,] 1.127804675 0.4994702750 0.447529933 0.082389929 0.666133984
## [890,] 0.515179011 2.1466916977 0.359088124 1.659371415 1.008084957
## [891,] 1.790760039 1.4926375033 0.569409830 1.982419793 0.569916867
## [892,] 1.856427479 0.6420151105 1.372340409 0.288058031 1.837994324
## [893,] 0.518094995 0.7301939485 1.997439975 1.825719724 1.146308969
## [894,] 0.283571369 2.7178512084 1.341821604 0.697648753 0.366575429
## [895,] 0.838837580 1.9476553535 0.239202811 1.263740235 1.154159281
## [896,] 0.590209145 0.7653687506 0.247131128 1.568680922 0.843339052
## [897,] 1.020982759 0.7852331752 -0.079549011 0.377684899 0.044494932
## [898,] 2.112366817 0.5149745471 1.349866974 1.576094850 4.235922236
## [899,] -0.043209889 0.4502753722 1.440100530 0.958992866 0.475959668
## [900,] 0.305718424 0.1117628608 0.943009681 0.195099249 0.933492722
## [901,] 0.299755019 1.3485756352 0.468045843 0.206425750 0.691147204
## [902,] 1.329912655 1.4962424265 0.506004298 0.728954049 2.296228902
## [903,] 1.091290854 -0.0921086654 1.063939248 0.319240797 1.342716903
## [904,] 1.267155058 0.5043820714 0.800802154 1.505254312 1.255416809
## [905,] 0.687706906 0.7444508338 0.552103136 1.355717459 0.835289796
## [906,] -0.032963554 0.8436112120 0.416271803 0.411671842 0.261979033
## [907,] 0.312765594 0.7758333410 2.167389946 0.197502172 1.153056465
## [908,] 0.664537773 0.4903822528 0.350766023 0.980603071 2.500010015
## [909,] 0.545886359 0.8288299348 0.869504117 1.697585842 2.494430655
## [910,] 1.900139519 0.9116122055 1.723728523 1.196595366 1.186970859
## [911,] 0.621834588 0.8864044604 0.692172310 0.952094561 0.012591353
## [912,] 0.784224275 1.0295227885 1.443116943 -0.096498969 1.203313630
## [913,] 2.506345312 0.2657823890 0.429994074 3.066034334 1.600125893
## [914,] 0.543928745 0.3676876315 0.741525344 1.058253837 0.741758248
## [915,] 1.326474128 1.6280497599 2.027724181 2.405159802 2.068892554
## [916,] 2.448898622 1.2861660310 0.508204587 0.117841548 0.734257940
## [917,] 0.874125756 2.0014739381 1.379340823 3.323059752 0.272103820
## [918,] 1.337448532 1.4165553177 2.425536984 0.232155261 0.456814725
## [919,] 0.912548185 0.6732239721 0.878777460 0.677313787 0.895291543
## [920,] 1.236086795 0.7378956457 0.446347872 0.466540785 0.750539431
## [921,] 0.067008896 1.5420303083 0.820651587 1.448029054 0.680527900
## [922,] 0.781992719 1.1830516951 0.912765319 0.573448174 0.355821010
## [923,] 0.978792332 1.5926103397 0.624436919 0.667537164 0.707737214
## [924,] 1.081418644 -0.0203245690 3.693593984 0.750351927 1.293932697
## [925,] 0.965164344 0.3400256003 0.606121237 1.341902319 0.726317157
## [926,] 2.706730461 2.2107568017 1.559826724 1.389298406 0.672147005
## [927,] 1.113865394 0.9882396377 2.058976783 0.590774016 2.093727039
## [928,] 2.371796258 0.0027413404 0.772338609 0.337127412 1.631022705
## [929,] 0.183373147 0.8046016956 0.399572755 2.228171741 0.692179674
## [930,] 0.423151092 0.9785107744 0.635725772 0.405686839 0.987086459
## [931,] 0.622013813 0.4706746015 1.028105082 1.795503573 0.500931125

```

```

## [932,] 1.131271142 1.8821540242 1.651656250 1.181731218 2.058280391
## [933,] 0.473696596 1.5245541767 0.807207776 1.593914689 0.944327316
## [934,] 1.522567903 0.6856051173 0.601886362 1.040475285 0.871393469
## [935,] 1.090575922 0.6346099057 0.601451039 1.097539027 0.598951366
## [936,] 1.944488651 2.8955002140 0.748939038 2.522825943 0.647316548
## [937,] 1.378097874 1.2207797603 1.179919436 0.478209998 0.493171136
## [938,] 1.275931729 0.5438132384 0.769056221 2.488545690 1.416469542
## [939,] -0.139716924 1.4612286193 1.871032360 0.906635194 0.130773605
## [940,] -0.145725808 1.2688685008 0.806957359 0.800859554 0.580097994
## [941,] 0.797519194 1.4767514214 1.056766202 0.545156797 0.901966686
## [942,] 0.343997464 1.7828776278 1.391449480 1.153777214 2.217183532
## [943,] 1.163570820 2.0888201136 1.628313580 0.861026019 2.290393004
## [944,] 0.408741756 0.2198799375 2.083097380 1.188929200 0.338742641
## [945,] 0.175603151 2.5160762819 1.199827774 1.032822971 0.886334112
## [946,] 1.522968945 1.1815224842 1.067302144 1.112368822 2.217689926
## [947,] 2.239244411 0.7222907735 -0.056369597 1.275970267 1.335855234
## [948,] 2.951301819 0.6870974583 0.082072961 2.722803457 1.274398848
## [949,] 0.162768098 0.9189128480 0.031503943 1.258094629 1.149736763
## [950,] 1.465392548 0.9033093801 0.148919855 1.167803090 2.662104205
## [951,] 1.123043353 1.5085877993 1.109440442 0.944494559 1.462514139
## [952,] 0.458486534 1.0628705629 2.880705141 1.279799766 0.611865533
## [953,] 1.307951720 2.0771416441 0.471687203 2.557488552 0.631243915
## [954,] 0.613703168 1.4242082135 2.102992560 0.270036196 0.446831408
## [955,] 1.751664664 1.4190056533 1.065770076 1.688939054 1.229794874
## [956,] 1.397381250 0.3798069025 1.023980600 1.127334312 3.082439939
## [957,] 0.605774329 1.3888854507 1.297206760 1.517124558 0.463076803
## [958,] 0.173933362 1.3698667849 0.327370723 2.222355594 1.350483434
## [959,] 3.343130153 0.4517580185 0.760512275 0.768069100 0.849119485
## [960,] 0.390841375 1.0529834957 1.452720307 0.956180745 0.359073348
## [961,] 0.782345179 0.5454687276 0.578189007 0.384598234 0.702182401
## [962,] 0.234874024 2.1317677429 0.419189361 0.100199498 0.968448559
## [963,] 1.262888417 1.1509160081 2.153040305 0.807479258 1.467498533
## [964,] 0.391356796 1.2056098314 0.184383643 0.688676100 1.249837594
## [965,] 0.456257064 0.3170533690 0.716146317 0.278990102 1.125918124
## [966,] 1.289103882 2.2167078040 1.172634295 1.207169753 0.589017436
## [967,] 0.425974417 0.6884972181 0.564357477 0.632096192 0.917294006
## [968,] 0.094355727 0.8444080143 0.648523777 0.917486831 1.277356758
## [969,] 1.528064044 1.3045340506 3.398031782 1.483630857 0.598939675
## [970,] 0.603265994 0.5240448555 1.698851380 0.595994353 0.419322482
## [971,] 0.392790195 1.6370070560 0.396349578 3.073025528 2.881772772
## [972,] 0.091272406 0.6537999914 1.663739814 1.197526885 0.547741531
## [973,] 0.964740514 1.6262815891 0.579698628 1.052725273 1.008136480
## [974,] 1.606232184 0.2185117334 0.802108230 2.900913558 0.822305522
## [975,] 2.348574288 3.0384767073 0.386593912 1.068092163 1.120651259
## [976,] 0.748390764 1.0625394460 0.689910427 0.624110394 0.848479752
## [977,] 1.202332530 0.9659691153 0.550489625 0.452142813 1.522586929
## [978,] 1.025881720 0.7033068554 2.059886751 0.610433140 0.459121490
## [979,] 0.040165515 1.4759126006 2.128905411 2.516329548 1.354150088
## [980,] 0.153438992 0.5027156635 1.295670154 0.521416435 0.536759690
## [981,] 1.882625811 1.1207341585 0.158481312 1.118739928 0.718565566
## [982,] 0.594714762 0.4307408896 0.235689532 1.117024229 0.772699546
## [983,] 0.460778497 1.1019702369 0.577044254 1.299257342 1.434210706
## [984,] 0.688657157 1.2649090711 2.059407365 2.051219493 0.545671276
## [985,] 1.280056394 1.5763230232 1.009835409 0.198076235 0.262725285

```

```

## [986,] 0.603631333 1.9301214629 1.072630374 1.069389688 0.605806578
## [987,] 0.890203075 0.4858118436 -0.168528363 0.065231525 1.169571505
## [988,] 0.914475742 0.5051891441 0.505250624 0.233940045 1.691446267
## [989,] 1.107987872 1.6644517755 0.492074897 0.399470999 1.814932039
## [990,] 0.817462508 0.3875993127 1.956320751 1.223780989 0.338060931
## [991,] 0.087020454 1.6981416292 1.275566512 0.075722333 1.302532069
## [992,] 1.364834098 0.2207683995 0.094193469 1.119058073 0.246428049
## [993,] 1.355889556 0.9848096604 1.316094128 0.767894984 1.889322610
## [994,] 0.645517798 1.5116766945 0.061708932 1.004309410 2.411999440
## [995,] 1.658038207 2.7858192163 1.324854183 1.937040018 0.504065488
## [996,] 0.415432533 2.0783719698 0.171291438 1.199165346 0.764696914
## [997,] 0.210457998 0.6653888214 0.316189237 3.271591342 -0.006755045
## [998,] 0.410851578 0.6002449697 2.268371485 0.763621673 0.884065960
## [999,] 0.461784672 1.4968761759 1.208056724 1.268424068 0.745101694
## [,11]      [,12]
## [1,] 0.279390978 0.327984210
## [2,] 0.247323055 0.120085528
## [3,] 1.249760319 0.712092028
## [4,] 0.801970926 1.804253089
## [5,] 1.744156578 0.124577806
## [6,] 0.294823425 0.189613536
## [7,] 1.040249254 1.024359570
## [8,] 0.482076785 1.541923958
## [9,] 0.868129658 2.788746738
## [10,] 1.415135424 1.499602110
## [11,] 1.802921926 0.827544956
## [12,] 1.606129347 1.850234108
## [13,] 0.860008400 1.178471064
## [14,] 1.097287532 0.390641846
## [15,] 0.725524304 0.973458717
## [16,] 1.317379345 0.648062034
## [17,] 0.398718016 0.846216128
## [18,] 2.395755759 0.573855999
## [19,] 0.941395696 0.472909943
## [20,] 1.247850691 0.386736613
## [21,] 0.423841659 1.380817611
## [22,] 2.577893508 1.218337741
## [23,] 0.374665922 1.823470704
## [24,] 0.545569918 1.121878565
## [25,] 0.884192418 1.871327998
## [26,] 0.311974217 0.980777269
## [27,] 0.292490539 0.426381656
## [28,] 1.269189423 3.283639524
## [29,] 2.086857620 1.303696113
## [30,] 0.366146086 1.879506247
## [31,] 0.350022812 1.665524514
## [32,] 1.808585259 0.690172441
## [33,] 0.441337420 0.622731533
## [34,] 1.229488529 1.153323075
## [35,] 1.251995369 1.282270598
## [36,] 1.732227290 1.733061370
## [37,] 0.963736953 1.440511862
## [38,] 1.425174951 1.690496785
## [39,] 3.737627647 0.338862768

```

```

## [40,] 1.073198913 1.777649401
## [41,] 1.106326989 0.946429019
## [42,] 1.799082632 0.603255307
## [43,] 2.762957645 0.830144172
## [44,] 1.157521794 1.235515513
## [45,] 2.966621464 1.389576506
## [46,] 1.906652314 1.078732028
## [47,] 0.367409028 0.680915208
## [48,] 0.511966937 2.648103323
## [49,] 1.733944642 0.389018945
## [50,] 1.045854123 0.687591467
## [51,] 0.350548611 0.311627678
## [52,] 0.142991986 3.740366920
## [53,] 0.159262164 1.046416891
## [54,] 0.431521576 2.393951140
## [55,] 1.311978766 0.506852917
## [56,] 0.991386289 2.314112058
## [57,] 0.466887401 3.723627360
## [58,] 1.278219839 0.197039718
## [59,] 0.181207380 0.375226649
## [60,] 1.005037944 1.178935342
## [61,] 0.177829862 2.344767153
## [62,] 0.867781898 3.534414323
## [63,] 0.483392950 1.010648947
## [64,] 0.444003756 1.956761127
## [65,] 0.506309611 1.609771358
## [66,] 2.309644709 0.056399510
## [67,] 0.290045805 1.314699153
## [68,] 0.495778430 1.307662793
## [69,] 2.917954279 1.635521521
## [70,] 0.335739528 0.771155330
## [71,] 0.989370348 0.713277530
## [72,] 0.104310024 1.792255311
## [73,] 0.428825969 0.568322870
## [74,] 0.831607806 0.366444824
## [75,] 0.738350510 0.263493794
## [76,] 1.232165049 3.281990095
## [77,] 1.072638564 0.783738727
## [78,] 0.884984017 0.812324638
## [79,] 0.505442560 1.712930310
## [80,] 1.014561448 0.938854539
## [81,] 1.143142712 1.090457627
## [82,] 0.615359766 0.937024655
## [83,] 0.645305414 0.685874416
## [84,] 0.538810793 1.560551273
## [85,] 3.097000377 1.848362937
## [86,] 1.431924983 0.443441872
## [87,] 0.411389690 0.500566608
## [88,] 0.190545656 0.564953496
## [89,] 1.127162787 0.985176465
## [90,] 0.082889119 1.223884498
## [91,] 0.175805112 0.712811826
## [92,] 0.634060878 0.301722283
## [93,] 1.218978964 0.336277027

```

```

## [94,] 0.903088677 0.088567241
## [95,] 0.350593085 0.590635967
## [96,] 0.986775306 1.354257270
## [97,] 1.447645364 0.472647578
## [98,] 0.580080378 1.320152940
## [99,] 1.054505094 1.364360805
## [100,] 2.313042260 2.388804736
## [101,] 0.941689204 0.946675376
## [102,] 0.261533911 0.746285832
## [103,] 3.001903443 1.642797024
## [104,] 0.241374004 0.502114339
## [105,] 2.006245358 2.250755878
## [106,] 1.095872997 0.590276173
## [107,] 0.531638825 0.744246397
## [108,] 1.447541954 2.060001547
## [109,] 0.480016482 2.024229874
## [110,] 0.884983326 0.412199134
## [111,] 0.643905845 1.076076116
## [112,] 0.440187344 1.125553822
## [113,] 0.360687478 0.488373199
## [114,] 0.348617108 0.521097179
## [115,] 1.303392892 0.454171610
## [116,] 1.492694822 0.866341890
## [117,] 0.818451038 0.813153776
## [118,] 1.069205010 0.045298973
## [119,] 2.877992747 1.529344761
## [120,] 0.450356224 0.546283371
## [121,] 1.255490187 0.644275126
## [122,] 0.250311400 1.531412796
## [123,] 2.042439697 3.843379185
## [124,] 0.484400397 0.787112117
## [125,] 1.250770985 0.897442028
## [126,] 0.830489726 1.693012116
## [127,] 0.310603273 2.100052838
## [128,] 0.585605109 0.297688581
## [129,] 0.343616523 0.429110244
## [130,] 0.648885329 0.895663171
## [131,] 0.384643273 0.449220896
## [132,] 0.922252254 0.572320226
## [133,] 2.056115052 1.340656215
## [134,] 1.117486332 1.335909997
## [135,] 0.393420714 0.955323458
## [136,] 0.704874367 1.037397972
## [137,] 0.279643879 0.624273826
## [138,] 0.241905800 1.028334611
## [139,] 1.716275617 0.883354234
## [140,] 0.747471743 2.734724214
## [141,] 0.501224941 1.408981806
## [142,] 0.604584429 1.883777178
## [143,] 0.850157065 1.334766399
## [144,] 0.774636481 0.807189621
## [145,] 1.295472942 2.982537477
## [146,] 0.736548706 0.551403482
## [147,] 1.423321454 0.768577510

```

```

## [148,] 0.499517638 0.425892184
## [149,] 0.870315039 0.670443081
## [150,] 1.192926387 0.312431519
## [151,] 1.630821851 0.307839956
## [152,] 3.087137201 0.828835262
## [153,] 0.909294066 1.515385087
## [154,] 0.640984270 1.032160686
## [155,] 0.124489360 1.706609498
## [156,] 0.738795013 0.194419130
## [157,] 0.684610634 0.451511925
## [158,] 0.466364714 0.705137135
## [159,] 1.408922907 0.211244540
## [160,] 2.006548552 1.998559575
## [161,] 1.029394029 0.317890005
## [162,] 0.687179524 1.523060847
## [163,] 1.222732821 1.647565375
## [164,] 0.729060918 0.678413149
## [165,] 0.381960070 1.047395058
## [166,] 1.378902108 0.444442998
## [167,] 0.214367538 1.163653309
## [168,] 1.528776650 0.467529655
## [169,] 1.429083798 2.476137323
## [170,] 0.411973930 0.673293466
## [171,] 1.478120165 0.790096063
## [172,] 0.398501929 0.822893542
## [173,] 0.323186853 1.336683444
## [174,] 1.579575619 1.523445948
## [175,] 0.891575582 4.222568897
## [176,] 2.046073257 1.427801552
## [177,] 0.259693783 0.157920794
## [178,] 1.605538933 0.944868727
## [179,] 0.985038483 1.679856934
## [180,] 1.210992855 0.868330617
## [181,] 1.743366066 0.289015538
## [182,] 0.992253841 0.557659051
## [183,] 0.570748227 0.808593832
## [184,] 0.738581172 0.708477116
## [185,] 1.171249668 1.062164097
## [186,] 0.357044948 0.894677577
## [187,] 1.102709415 0.647647457
## [188,] 3.090453475 1.135743598
## [189,] 1.057776011 0.570829687
## [190,] 0.649879059 0.624743496
## [191,] 1.773125711 1.336538352
## [192,] 1.115146498 0.348279830
## [193,] 1.643626444 0.754097360
## [194,] 0.155832574 0.674060191
## [195,] 1.898858167 0.894085246
## [196,] 0.193721751 0.304195781
## [197,] 1.787170032 0.984158057
## [198,] 0.954807823 1.953553240
## [199,] 1.295957807 0.540804705
## [200,] 0.629241853 0.919134571
## [201,] 1.559738203 0.090948455

```

```

## [202,] 1.021011709 1.298362682
## [203,] 0.318438618 1.707631164
## [204,] 0.353517646 0.275972249
## [205,] 0.145965188 1.075211806
## [206,] 1.257128119 0.626113127
## [207,] 1.346176146 0.989390987
## [208,] 1.788003729 0.492776894
## [209,] 1.204954514 1.442829929
## [210,] 0.345106909 2.247876095
## [211,] 0.399244294 1.008789329
## [212,] 1.006770637 1.239804964
## [213,] 0.648900852 0.827102882
## [214,] 1.610968847 2.131519950
## [215,] 0.291624690 1.334846774
## [216,] 1.030822243 0.236816547
## [217,] 1.292913910 2.208327483
## [218,] 0.530783345 2.243479303
## [219,] 0.155912147 0.424596290
## [220,] 0.656264349 2.134255990
## [221,] 1.151861305 1.205497572
## [222,] 1.156122985 0.649727548
## [223,] 0.027054562 0.690669695
## [224,] 1.620432326 1.806628070
## [225,] 0.674906456 3.654524954
## [226,] 1.690037541 0.571788008
## [227,] 0.657480200 0.949886025
## [228,] 1.073965166 0.792725781
## [229,] 0.131980681 0.174392602
## [230,] 1.149142493 0.191737406
## [231,] 2.030618230 1.745822873
## [232,] 0.505143541 0.650264063
## [233,] 1.915506017 0.497738641
## [234,] 1.886436732 2.294167467
## [235,] 1.259534348 0.817238931
## [236,] 0.583028762 1.098650202
## [237,] 0.998345244 1.645300059
## [238,] 1.972272681 2.625021520
## [239,] 1.217689113 1.325612500
## [240,] 1.359835639 2.126231798
## [241,] 0.771240282 1.484592266
## [242,] 0.957002555 0.770351376
## [243,] 1.781794326 2.341523151
## [244,] 0.862077679 2.172310989
## [245,] 0.062144235 0.351228973
## [246,] 2.402451307 0.065522773
## [247,] 0.584863315 0.017286699
## [248,] 2.130805172 1.196509183
## [249,] 0.087335844 1.408922447
## [250,] 0.274792589 1.251307069
## [251,] 0.765030021 0.310733766
## [252,] 0.455731399 0.223718310
## [253,] 0.545547163 0.194539854
## [254,] 0.595816713 0.472416934
## [255,] 2.294980328 2.223173402

```

```

## [256,] 0.658109291 0.614771419
## [257,] 2.528053353 1.394070730
## [258,] 2.069597624 0.813338281
## [259,] 0.999955142 0.588878807
## [260,] 0.598936537 1.478275349
## [261,] 2.622372739 2.270514636
## [262,] 1.516062078 0.583992488
## [263,] 0.904400203 2.115460921
## [264,] 0.395813968 1.089995304
## [265,] 0.790839820 0.736329120
## [266,] 1.128903240 0.756674497
## [267,] 1.414868406 1.911412910
## [268,] 0.825056807 1.592557642
## [269,] 0.087051558 1.903468108
## [270,] 0.912936215 0.727736500
## [271,] 0.518871610 -0.094153607
## [272,] 0.156183598 0.768635337
## [273,] 1.696144335 0.559802882
## [274,] 0.800255664 0.527950165
## [275,] 0.602538265 1.931851703
## [276,] 2.472167237 0.660872272
## [277,] 0.899402333 2.267835910
## [278,] 1.946375438 0.628263441
## [279,] 0.215305724 1.829607060
## [280,] 1.005315306 0.402735436
## [281,] 1.917631878 0.461360926
## [282,] 0.993908401 0.215481334
## [283,] 0.466915525 1.662163111
## [284,] 1.136167515 1.514683834
## [285,] 0.314444038 0.525834610
## [286,] 1.843829646 0.741573169
## [287,] 1.882104221 1.320272120
## [288,] 1.213693343 0.600626320
## [289,] 0.962051346 0.856113586
## [290,] 0.970795296 3.345337959
## [291,] 0.946992073 1.240260121
## [292,] 1.743758901 0.570301912
## [293,] 0.549365897 0.583860533
## [294,] 0.180350349 0.942217060
## [295,] 1.244530486 0.234267239
## [296,] 1.418155383 1.977022683
## [297,] 1.544321363 0.776324471
## [298,] 0.787463979 1.681566586
## [299,] 0.694125476 0.816063348
## [300,] 1.568547806 1.333446923
## [301,] 0.904723034 0.441350615
## [302,] 1.931950731 1.061137659
## [303,] 0.321144620 1.293974130
## [304,] 1.147736015 1.821726195
## [305,] 0.922429635 0.896545034
## [306,] 0.069262979 0.973921874
## [307,] 1.473212091 0.207984039
## [308,] 1.289973403 0.991248510
## [309,] 0.566600686 0.627051452

```

```

## [310,] 0.788425734 1.814490188
## [311,] 1.316594631 1.652658406
## [312,] 1.097260306 0.963091049
## [313,] 1.443442680 0.244266492
## [314,] 0.973062762 1.600529568
## [315,] 0.933398759 1.907139426
## [316,] 0.536142908 1.008082677
## [317,] 1.276683213 1.374522155
## [318,] 1.120545511 1.873693894
## [319,] 0.714127872 1.017654748
## [320,] 1.345789595 1.248287753
## [321,] 0.483722484 1.835805739
## [322,] 1.125060181 2.900865960
## [323,] 1.980229236 0.648606144
## [324,] 0.964086133 1.890591891
## [325,] 0.424999879 1.834702365
## [326,] 0.069451451 0.576056009
## [327,] 0.584278331 1.179935790
## [328,] 2.820677000 0.678740292
## [329,] 1.685677454 0.648839750
## [330,] 1.060661217 0.604994748
## [331,] 0.293266465 0.536427533
## [332,] 1.304756176 1.440641982
## [333,] 2.092777813 0.420390472
## [334,] 0.580764581 1.024928089
## [335,] 1.198338602 0.850874881
## [336,] 0.146977629 0.417437672
## [337,] 1.226478587 1.681257966
## [338,] 0.224601605 2.061788108
## [339,] 1.761667952 1.070200216
## [340,] 0.739981482 0.208847574
## [341,] 2.086563722 1.419320721
## [342,] 0.767086373 0.915581609
## [343,] 1.215287960 1.446508620
## [344,] 1.858920800 0.505349051
## [345,] 4.063415731 0.299374976
## [346,] 0.630600629 0.884423131
## [347,] 1.090603559 3.068763176
## [348,] 0.454934383 0.831811099
## [349,] 2.185413239 0.942164761
## [350,] 0.404695185 0.740263593
## [351,] 1.188247211 1.855448100
## [352,] 0.936914243 1.235806857
## [353,] 0.347472735 2.020331441
## [354,] 0.644610292 1.592682900
## [355,] 0.869650365 -0.014258365
## [356,] 1.234102013 0.419466619
## [357,] 0.724078601 1.722243148
## [358,] 0.578867004 0.848214353
## [359,] 0.432284802 0.129654354
## [360,] 1.751059812 0.672344609
## [361,] 2.009914981 1.439471742
## [362,] 1.232712478 1.348525188
## [363,] 1.745066709 1.900929726

```

```

## [364,] 1.291623688 1.882102309
## [365,] 1.193252986 2.853306268
## [366,] 0.945944148 1.647218307
## [367,] 0.836969189 3.098436596
## [368,] 2.388334905 0.332683049
## [369,] 0.548563972 1.168980075
## [370,] 1.196945496 1.086759171
## [371,] 0.516803993 0.574620461
## [372,] 0.770538025 0.781717245
## [373,] 5.160146914 1.354580010
## [374,] 0.563433952 1.470337483
## [375,] 1.322074189 0.759277027
## [376,] 0.937090770 2.003954310
## [377,] 0.982738062 1.146337801
## [378,] 1.352764805 1.052336525
## [379,] 1.421840340 1.606299944
## [380,] 0.184033600 1.134137454
## [381,] 0.550782479 0.908238144
## [382,] 1.753594785 0.940080431
## [383,] 1.314060596 2.343177432
## [384,] 0.625542949 0.439466957
## [385,] 1.524335248 1.616329611
## [386,] 0.423379791 1.057446308
## [387,] 0.662330759 0.729657148
## [388,] 0.658312017 0.630652849
## [389,] 0.886793006 0.800785944
## [390,] -0.147970623 0.180538350
## [391,] 0.462982685 1.303984782
## [392,] 1.555934699 5.736920703
## [393,] 1.038151428 1.886583950
## [394,] 2.278494287 1.022185991
## [395,] 0.335133259 0.484658234
## [396,] 0.359735312 1.143513693
## [397,] 0.320038760 1.845527438
## [398,] 0.574415257 0.666376833
## [399,] 0.877498337 0.366730825
## [400,] 1.197903109 1.209061421
## [401,] 2.054744884 2.763596225
## [402,] 1.006690385 1.207388716
## [403,] 1.435285032 1.248141186
## [404,] 0.272873525 1.227575765
## [405,] 1.485143568 0.796572993
## [406,] 0.670491860 3.087522595
## [407,] 1.459544790 1.831717792
## [408,] 2.063136159 0.257525112
## [409,] 1.477448072 0.796084551
## [410,] 2.011634081 2.717441339
## [411,] 0.323076161 0.459538495
## [412,] 1.417168167 1.166565272
## [413,] 0.880109316 2.610669124
## [414,] 0.190784646 1.011861568
## [415,] 0.053844711 0.434009032
## [416,] 1.061780731 2.369799604
## [417,] 0.941814570 1.193641566

```

```

## [418,] 0.681658773 0.639939695
## [419,] -0.006841541 1.498672377
## [420,] 0.523731398 2.316874063
## [421,] 0.232341915 2.621410273
## [422,] 0.477369939 0.127161244
## [423,] 2.250264383 0.314947280
## [424,] 1.933320655 0.283602776
## [425,] 0.737795322 1.386094338
## [426,] 0.291707229 1.146475669
## [427,] 0.533449589 0.250504453
## [428,] 0.577991764 1.721344511
## [429,] 1.403313672 0.527804095
## [430,] 0.212646065 0.576910986
## [431,] 0.480478170 2.250062224
## [432,] 0.585107558 1.528560724
## [433,] 0.914989232 1.394406634
## [434,] 1.063539373 1.066810920
## [435,] 0.698152368 0.259670835
## [436,] 1.685802792 0.274051520
## [437,] 1.581504635 1.357229482
## [438,] 1.163354656 0.852625610
## [439,] 1.328410017 -0.172140332
## [440,] 0.428174577 0.329744953
## [441,] 3.260092352 -0.051209004
## [442,] 2.289835706 0.250685307
## [443,] 0.671023053 0.720562713
## [444,] 0.096227790 1.073486568
## [445,] 0.791765083 1.588042286
## [446,] 0.591609966 2.551905529
## [447,] 0.145224319 2.411318699
## [448,] 0.856982130 1.133599880
## [449,] 1.184226606 0.871500846
## [450,] 0.217698473 0.359114221
## [451,] 0.540275693 -0.006066554
## [452,] 0.516744227 0.874106840
## [453,] 0.385037301 0.524634699
## [454,] 1.925236654 1.024656832
## [455,] 0.145631315 1.644866899
## [456,] 0.726987633 3.251560981
## [457,] 1.896567846 0.207748151
## [458,] 0.576989525 0.481039945
## [459,] 0.171492940 1.595097564
## [460,] 0.295556554 0.895153659
## [461,] 0.547458139 0.297193199
## [462,] 0.862166625 0.314651865
## [463,] 1.628385065 0.335438647
## [464,] 1.018031561 2.995167571
## [465,] 2.110276702 1.011393496
## [466,] 0.521039998 1.711518303
## [467,] 0.383430372 1.169915725
## [468,] 0.930370417 1.015444783
## [469,] 1.166226064 2.301570552
## [470,] 0.339167345 0.552420334
## [471,] 1.213580324 0.194045046

```

```

## [472,] 0.810050001 0.362972288
## [473,] 2.453180074 0.438967322
## [474,] 1.037089244 0.320372728
## [475,] 0.286887812 0.465198244
## [476,] 0.769088908 1.417764338
## [477,] 0.452651723 0.595874367
## [478,] 1.346209400 0.823219463
## [479,] 0.218600579 2.031665448
## [480,] 0.903933170 2.214914749
## [481,] 0.190980199 0.944723990
## [482,] 0.677061502 0.645871050
## [483,] 0.845537000 0.970224458
## [484,] 0.978664818 0.997461862
## [485,] 0.475598171 1.329076486
## [486,] 0.471925394 0.645003749
## [487,] 1.968101979 1.151902852
## [488,] 0.360331612 0.420121238
## [489,] 1.754297431 0.485422695
## [490,] 0.582733117 0.092577495
## [491,] 2.075826306 1.333485897
## [492,] 0.359853718 1.040158955
## [493,] 1.459967752 1.507362020
## [494,] 0.984650087 0.822542812
## [495,] 0.472649753 0.397231390
## [496,] 5.028733823 0.469345848
## [497,] 0.715999855 0.011105829
## [498,] 0.269031936 2.481294211
## [499,] 0.685034175 0.089250642
## [500,] 0.666200104 0.521226434
## [501,] 0.748202180 3.830564097
## [502,] 2.545946175 1.113945385
## [503,] 2.044985726 0.318483462
## [504,] 0.306595990 0.750452048
## [505,] 0.158092715 1.245233353
## [506,] 1.269486317 2.053752720
## [507,] 1.278036255 1.503867846
## [508,] 2.049209737 1.105824051
## [509,] 0.141725344 1.292094994
## [510,] 1.014301190 1.106509094
## [511,] 0.862655075 0.912152616
## [512,] 0.518602594 0.780194852
## [513,] 0.710697204 1.881167174
## [514,] 0.907915757 0.708647998
## [515,] 1.617141961 0.603191207
## [516,] 0.719668714 0.857903203
## [517,] 1.416140181 1.421541293
## [518,] 0.116902335 1.134382601
## [519,] 0.930129174 0.572249919
## [520,] 0.627381345 0.618166619
## [521,] 1.212077076 0.376476760
## [522,] 0.551121373 0.843042383
## [523,] 3.355691438 0.336793651
## [524,] 1.478005724 2.005338981
## [525,] 0.595391521 1.043603333

```

```

## [526,] 0.592157328 0.916378792
## [527,] 1.312468349 1.792963382
## [528,] 1.638674218 1.000247300
## [529,] 1.892721779 0.982770278
## [530,] 0.219953408 2.721971004
## [531,] 0.143450903 2.390915886
## [532,] 0.582013604 1.468730311
## [533,] 0.808040099 2.252571603
## [534,] 0.188674035 0.483587484
## [535,] 3.145010574 0.796644596
## [536,] 0.365299807 3.000169926
## [537,] 1.444305176 0.840047552
## [538,] 0.315118696 -0.065537476
## [539,] 1.309632443 1.714159790
## [540,] 0.583325202 0.576111278
## [541,] 0.459683177 0.791625592
## [542,] 0.713889464 0.457899434
## [543,] 0.673958687 1.625916149
## [544,] 1.541889865 0.975251581
## [545,] 1.100373201 0.615268784
## [546,] 0.769944874 0.492574931
## [547,] 1.073473384 2.605177805
## [548,] 0.460412121 1.087747217
## [549,] 1.092610548 0.207944772
## [550,] 0.483443931 1.269313611
## [551,] 0.662360414 2.484190096
## [552,] 0.553167926 0.636828669
## [553,] 2.955353582 1.240910244
## [554,] 1.213561901 0.896619350
## [555,] 0.363743414 0.629505860
## [556,] 0.673796999 0.371638492
## [557,] 0.820079357 0.447626285
## [558,] 0.168635207 3.698156745
## [559,] 0.351167719 0.544200406
## [560,] 0.520856623 0.456389533
## [561,] 1.052760846 0.495154554
## [562,] 1.492120642 0.968016052
## [563,] 3.460001253 0.888522086
## [564,] 0.303055715 0.155311835
## [565,] 0.594489615 1.586429031
## [566,] 0.348162900 1.282579962
## [567,] 0.491513287 0.337374507
## [568,] 0.075230329 1.414230007
## [569,] 2.039716618 0.087177823
## [570,] 0.439646989 1.120821928
## [571,] 2.288200527 0.505013761
## [572,] 0.182715865 2.295142058
## [573,] 0.743716481 0.622364721
## [574,] 1.374677938 0.357322928
## [575,] 1.031103108 1.317314206
## [576,] 0.643443226 1.073767551
## [577,] 1.543314597 1.998210679
## [578,] 0.278766216 1.307277044
## [579,] 2.036306852 0.288969856

```

```

## [580,] 0.562351350 0.493475464
## [581,] 1.464091867 1.260073042
## [582,] 3.044726376 0.769873617
## [583,] 0.682950216 1.499948087
## [584,] 1.064090248 0.905789266
## [585,] 1.938698612 1.854541228
## [586,] 1.634563913 1.310201355
## [587,] -0.003857462 0.446311361
## [588,] -0.185226057 0.326218521
## [589,] 0.636927633 0.269096149
## [590,] 1.195178895 0.179278828
## [591,] 0.908501043 1.336162493
## [592,] 0.405052155 1.694777537
## [593,] 0.017805750 0.425537153
## [594,] 0.340681308 0.720973422
## [595,] 0.579561533 0.601539913
## [596,] 0.789997914 2.244452106
## [597,] 0.294242805 0.720905107
## [598,] 1.341523419 0.872936083
## [599,] 3.294870036 1.898058621
## [600,] 0.430077293 1.142631956
## [601,] 0.272173365 0.670985891
## [602,] 0.585751118 0.612819764
## [603,] 2.842092298 0.553176418
## [604,] 0.724248200 1.307805410
## [605,] 0.488565645 0.466869901
## [606,] 0.650257211 0.695075627
## [607,] 1.748637220 2.009040232
## [608,] 0.888636268 1.576044904
## [609,] 0.556052710 1.187190395
## [610,] 0.514612851 1.521899809
## [611,] 0.754496929 0.203293093
## [612,] 1.470495728 0.296842132
## [613,] 1.670743457 0.778463388
## [614,] 0.445276263 0.765011441
## [615,] 0.571896854 0.923959450
## [616,] 1.864316971 0.859819352
## [617,] 0.726942031 0.860477104
## [618,] 1.097249772 0.574701769
## [619,] 0.610402939 0.735703014
## [620,] 0.468312586 0.868760248
## [621,] 0.701934667 0.439297559
## [622,] 1.658425196 2.342470336
## [623,] 3.602815704 0.563044771
## [624,] 1.680718440 0.427814782
## [625,] 1.050095328 0.384344972
## [626,] 0.774866076 0.579183807
## [627,] 1.141004928 1.844788697
## [628,] 1.273633406 0.680088051
## [629,] 0.904681030 1.410543601
## [630,] 0.387013121 0.306868764
## [631,] 0.862489518 1.727934403
## [632,] 0.985144886 0.908226083
## [633,] 1.354172868 0.541595610

```

```

## [634,] 1.498317555 0.625846584
## [635,] 0.919235782 1.676118427
## [636,] 0.937350083 -0.035908053
## [637,] 1.092513272 0.441407212
## [638,] 0.981238694 0.297982849
## [639,] 0.626827952 0.618068279
## [640,] 0.096910472 0.883306569
## [641,] 1.201925572 0.590861087
## [642,] 0.593124420 0.046382561
## [643,] 1.794449891 1.411609513
## [644,] 0.556017904 0.263969714
## [645,] 0.201935856 0.414981429
## [646,] 1.009521528 1.287343115
## [647,] 1.332732085 0.729363459
## [648,] 0.211659903 2.173073051
## [649,] 3.015088165 1.360418206
## [650,] 2.162744729 0.395847759
## [651,] 1.688316976 1.625750120
## [652,] 0.885487789 0.533273705
## [653,] 1.245774528 0.445076983
## [654,] 0.259244561 1.453862717
## [655,] 0.790883605 2.076351890
## [656,] 0.763561744 1.796714502
## [657,] 0.685314034 0.126559005
## [658,] 2.313678911 0.501801092
## [659,] 0.145559369 0.919568230
## [660,] 3.488303433 1.203720713
## [661,] 1.594211870 1.615465720
## [662,] 0.487103266 0.778936819
## [663,] 2.158534563 0.882426808
## [664,] 0.195828017 0.343913787
## [665,] 0.231334448 1.439212263
## [666,] 0.883494172 1.869305105
## [667,] 1.012875890 0.356238448
## [668,] 0.478311830 0.752475991
## [669,] 1.027220891 0.007054010
## [670,] 0.250829360 0.798710654
## [671,] 1.466738765 3.231688878
## [672,] 0.560964638 0.464196802
## [673,] 1.909387837 2.719724777
## [674,] 0.741486217 0.946977417
## [675,] 0.286665610 0.354165985
## [676,] 0.360338912 0.842759878
## [677,] 0.756151031 1.026769763
## [678,] 0.425051754 1.625365453
## [679,] 0.534217736 3.238430589
## [680,] 0.218829895 1.210527374
## [681,] 1.127431334 0.432720397
## [682,] 0.867018950 1.856316779
## [683,] 0.813529514 0.703308021
## [684,] 1.082832970 0.700074979
## [685,] 1.847900255 0.222584599
## [686,] 0.323565883 1.329900580
## [687,] 0.703182845 1.639859731

```

```

## [688,] 0.822749715 0.794228325
## [689,] 0.909137087 1.809093930
## [690,] 1.455674201 0.450137371
## [691,] 0.423242726 0.301144986
## [692,] 1.476810101 1.478086590
## [693,] 1.434067983 1.672235154
## [694,] 1.611578932 -0.170636753
## [695,] 1.024922512 1.836381273
## [696,] 0.997181381 1.307716363
## [697,] 0.462121558 1.579449841
## [698,] 0.631064353 0.571449536
## [699,] -0.081551697 0.727498508
## [700,] 1.238088407 0.466978879
## [701,] 0.246358351 1.209855520
## [702,] 0.686690067 0.664272689
## [703,] 0.259567651 0.206990387
## [704,] 0.919629694 1.904121219
## [705,] 0.694424288 1.507794531
## [706,] 1.781661837 0.594245857
## [707,] 1.405838759 0.186736136
## [708,] 1.432659809 1.577331218
## [709,] 0.845681044 0.149931373
## [710,] 0.698904850 0.507134186
## [711,] 2.154807510 0.398474382
## [712,] 0.448841710 1.127343908
## [713,] 1.160785698 0.825246062
## [714,] 0.527195698 0.792355897
## [715,] 0.126128314 2.606183141
## [716,] 0.240037984 0.023755037
## [717,] 2.737217999 0.089639921
## [718,] 1.204880141 0.899491549
## [719,] 0.454973860 0.108933920
## [720,] 1.433117011 1.449925099
## [721,] 0.086127181 0.560128963
## [722,] 0.828899707 2.708098998
## [723,] 0.377617671 0.601874543
## [724,] 0.535043928 0.259348897
## [725,] 0.371461976 0.837964022
## [726,] 0.737822566 2.290645846
## [727,] 2.098514420 2.244628909
## [728,] 0.690544798 0.420881037
## [729,] 0.660094089 1.218783708
## [730,] 1.628474523 0.279431011
## [731,] 1.933439822 2.659179487
## [732,] 0.177478742 0.680511672
## [733,] 1.735486175 1.494540935
## [734,] 1.441725338 0.051148357
## [735,] 0.588857273 0.127490413
## [736,] 0.095576656 1.690975405
## [737,] 1.161990622 0.655021461
## [738,] 0.643661031 1.391402265
## [739,] 0.262450918 0.353914774
## [740,] 0.013476500 0.499092313
## [741,] 0.445937317 0.534825156

```

```

## [742,] 0.248293739 1.182703907
## [743,] 1.064814091 0.561347300
## [744,] 0.513329770 0.521612908
## [745,] 0.167400215 1.141334285
## [746,] 0.900918695 2.562481441
## [747,] 1.760311389 0.766758760
## [748,] 0.552775850 0.623744750
## [749,] 1.434247805 0.351576558
## [750,] 0.457409489 1.732296363
## [751,] 0.565098270 0.366287847
## [752,] 0.506490280 0.827938573
## [753,] 1.114124444 0.699606952
## [754,] 0.358051374 1.124096459
## [755,] 0.874418751 1.242926979
## [756,] 0.319765756 2.888299008
## [757,] 0.668667728 1.920430702
## [758,] 0.094141810 0.016560226
## [759,] 0.829314780 1.089022831
## [760,] 0.918404288 2.683460070
## [761,] 0.768749567 0.011709247
## [762,] 0.760130414 0.411329913
## [763,] 0.303773449 0.353394082
## [764,] 1.057987468 1.052274483
## [765,] 1.469591958 0.175369274
## [766,] 5.857287995 0.866171781
## [767,] 1.198381907 0.821431536
## [768,] 0.642881392 0.636954217
## [769,] 0.447951952 2.390698881
## [770,] 2.674086177 0.876737839
## [771,] 0.939091415 0.316523940
## [772,] 0.640007579 0.343853680
## [773,] 0.426663501 1.622637981
## [774,] 0.883013268 1.727462354
## [775,] 1.514647740 1.225434798
## [776,] 0.317282879 0.299983500
## [777,] 0.609825148 0.757235621
## [778,] 1.340502168 1.989821067
## [779,] 0.836061559 0.938318054
## [780,] 1.737072670 0.853600550
## [781,] 0.617669798 0.968864287
## [782,] 0.624724628 1.357211483
## [783,] 1.199787340 2.282681927
## [784,] 0.865619060 0.496592086
## [785,] 0.581334893 1.541823205
## [786,] 0.779462829 0.524490065
## [787,] 0.545724454 1.009744122
## [788,] 2.406442389 2.948587067
## [789,] 1.159112562 0.455089096
## [790,] 1.058799875 1.231300715
## [791,] 0.896092743 0.540170464
## [792,] 0.731379714 0.259829461
## [793,] 1.012306169 -0.039392042
## [794,] 0.615552343 2.186449982
## [795,] 1.026627039 3.661324663

```

```

## [796,] 0.978558690 1.522970309
## [797,] 1.553719559 2.900081260
## [798,] 0.492302537 1.712309295
## [799,] 0.885433451 0.792568466
## [800,] 0.917514740 0.914220377
## [801,] 0.291747951 0.144934295
## [802,] 1.479978047 0.902219556
## [803,] 0.012032863 0.718820580
## [804,] 1.051328945 0.326713332
## [805,] 0.806004019 0.268456883
## [806,] 0.540406086 0.244000080
## [807,] 1.641201811 0.385911084
## [808,] 1.097852496 0.190556538
## [809,] 1.284889159 0.491694712
## [810,] 0.959868334 0.245199681
## [811,] 0.828514108 0.474531372
## [812,] 1.507047879 0.594092096
## [813,] 0.514070012 0.974440532
## [814,] 0.669032988 0.995235614
## [815,] 1.247916442 1.227750117
## [816,] 0.875791773 2.084874287
## [817,] 1.273026130 0.984278738
## [818,] 0.538080902 1.736403508
## [819,] 1.371557893 0.821451277
## [820,] 2.972032781 0.335783830
## [821,] 1.343197994 0.419457855
## [822,] 2.070163195 0.689454725
## [823,] 0.436084908 0.893071035
## [824,] 2.437695143 1.135772410
## [825,] 2.164671575 1.456542551
## [826,] 0.787216058 0.570428629
## [827,] 3.187290346 0.320125757
## [828,] 4.015145096 1.132437402
## [829,] 0.163236711 2.130272547
## [830,] 1.082840917 1.881667826
## [831,] 1.349702149 0.351430121
## [832,] 1.507889922 0.441358570
## [833,] 0.673455550 0.958635761
## [834,] 0.896436682 0.551595185
## [835,] 2.095604115 0.935599953
## [836,] 0.565777911 0.308605621
## [837,] 1.703489066 0.604300989
## [838,] 0.142019690 0.943197271
## [839,] 0.608247132 0.744735091
## [840,] 2.070808445 1.001098791
## [841,] 2.669658785 0.856518477
## [842,] 1.633248711 0.415104418
## [843,] 0.256101355 0.794058468
## [844,] 0.251461840 0.189186245
## [845,] 0.037691681 1.435756883
## [846,] 1.014002363 0.379301847
## [847,] 1.662898084 2.197136567
## [848,] 0.973174118 0.732088031
## [849,] 2.017384529 0.644921002

```

```

## [850,] 0.321885033 0.160945668
## [851,] 0.771326276 0.862641992
## [852,] 0.349721568 2.094143731
## [853,] 2.198191619 1.055930549
## [854,] 1.144021654 1.072263493
## [855,] 1.172640196 1.772484715
## [856,] 0.707905213 1.108197350
## [857,] 1.397087502 0.484359347
## [858,] 1.239956754 1.188560062
## [859,] 0.603631598 0.563931492
## [860,] 1.306366329 0.230438801
## [861,] 0.396646853 0.966794654
## [862,] 0.836010912 0.855378545
## [863,] 1.950450742 2.285651904
## [864,] 1.861016879 0.003310394
## [865,] 0.476791836 3.091286571
## [866,] -0.029904962 0.528827797
## [867,] 0.854665994 1.633144497
## [868,] 0.589463793 0.313710903
## [869,] 1.664921546 1.592309250
## [870,] 0.980127506 0.397419615
## [871,] 1.791699629 1.857462311
## [872,] 1.488479791 0.376501828
## [873,] 0.699883024 0.366815462
## [874,] 1.628314786 3.219162014
## [875,] 0.400391240 0.906419589
## [876,] 1.314420838 0.204506202
## [877,] 0.156458544 0.593161682
## [878,] 0.711748422 0.340787468
## [879,] 1.444785859 1.018084235
## [880,] 1.498115035 0.529817996
## [881,] 1.114736637 0.240367645
## [882,] 0.669158707 1.147443610
## [883,] 1.037263917 0.691939115
## [884,] 1.424954739 1.528570340
## [885,] 0.779574873 -0.198411015
## [886,] 0.543563929 0.414780067
## [887,] 1.797623879 1.101041220
## [888,] 0.040557162 2.497738537
## [889,] 0.891689758 0.209027901
## [890,] 0.498190211 3.039378420
## [891,] 2.668041800 0.808836770
## [892,] 0.985240060 1.000304600
## [893,] 0.296167679 1.249435601
## [894,] 0.859341289 2.852844034
## [895,] 1.522088611 0.898215544
## [896,] 1.482060467 1.568446220
## [897,] 1.105619497 0.068436728
## [898,] 1.008331001 0.537580725
## [899,] 0.451258485 2.617768712
## [900,] 1.654667498 2.031879181
## [901,] 0.697442802 0.730308206
## [902,] 1.213142507 1.486192427
## [903,] 1.341664480 0.674471930

```

```

## [904,] 1.129796817 0.612792238
## [905,] 1.644208571 2.033764624
## [906,] 0.533836258 0.634357483
## [907,] 1.474834501 1.871074490
## [908,] 0.997079593 2.466473959
## [909,] 0.196779144 1.789506721
## [910,] 1.118809792 1.296933036
## [911,] 0.550358241 0.183335472
## [912,] 0.896684330 0.364324859
## [913,] 2.528188288 0.536401982
## [914,] 0.182395090 0.802022086
## [915,] 4.658529263 2.742822847
## [916,] -0.012351807 0.461423201
## [917,] 1.605896713 0.705122335
## [918,] 1.258969080 0.426902252
## [919,] 0.615650571 0.570830297
## [920,] 0.347497031 0.566132673
## [921,] 0.571675329 0.433797943
## [922,] 2.499983738 1.581355894
## [923,] 0.221935205 0.629434167
## [924,] 2.066456845 1.282748604
## [925,] 1.268308243 1.028832026
## [926,] 0.473766343 1.489481525
## [927,] 0.536217549 1.318228031
## [928,] 0.763363377 0.231239898
## [929,] 0.487536499 1.748588867
## [930,] 0.346058544 1.937294582
## [931,] 0.131304334 0.543269177
## [932,] 1.020146422 1.899039137
## [933,] 0.229973116 0.158404431
## [934,] 0.693546287 2.067595867
## [935,] 0.892435504 1.673607399
## [936,] 0.845687315 0.414686505
## [937,] 1.292428338 1.194079749
## [938,] 0.265828569 0.767203726
## [939,] 2.223682748 1.547938007
## [940,] 0.449140279 1.504124464
## [941,] 0.861649465 0.417406129
## [942,] 0.526464195 1.025814222
## [943,] 2.050964623 0.427592030
## [944,] 0.451698009 0.514707590
## [945,] 0.502290879 1.894748235
## [946,] 0.436709487 1.021116233
## [947,] 2.239317584 0.971916874
## [948,] 0.555841038 0.941320671
## [949,] 1.001026422 0.099344262
## [950,] 1.468367327 0.442637566
## [951,] 1.216349329 1.348775844
## [952,] 0.919479263 0.728411075
## [953,] 0.214035590 1.207387612
## [954,] 1.188480748 1.512474094
## [955,] 0.032635763 0.907147051
## [956,] 1.538890692 0.257077459
## [957,] 1.660455824 1.515555038

```

```

## [958,] 1.391162719 1.007896865
## [959,] 0.740855257 0.675955456
## [960,] 0.856190428 0.181166627
## [961,] 0.341996067 2.096346673
## [962,] 1.575671894 0.652719144
## [963,] 0.327469846 0.658018921
## [964,] 0.900368871 0.898595651
## [965,] 2.358452903 0.693705564
## [966,] 0.372635294 0.177946431
## [967,] 0.146721308 0.832913741
## [968,] 2.277817629 1.238467865
## [969,] 2.086403045 1.039437145
## [970,] 0.586710568 0.647252352
## [971,] 0.294498276 0.127064005
## [972,] 0.720867953 0.236543602
## [973,] 0.197949199 1.038304656
## [974,] 1.056366648 0.706628911
## [975,] 0.623630411 0.262346035
## [976,] 1.245415658 1.714377566
## [977,] 1.937721039 0.244892321
## [978,] 1.678629782 1.028394727
## [979,] 1.097417890 0.340725167
## [980,] 2.179680972 0.586281880
## [981,] 1.977494170 2.343992859
## [982,] 2.776123901 0.394355699
## [983,] 0.810085697 0.576604141
## [984,] 0.796652761 0.997648363
## [985,] 0.657555277 0.001926905
## [986,] 0.855205035 0.674422149
## [987,] 1.017964320 0.278528220
## [988,] 1.085753721 3.698529462
## [989,] 2.344960163 0.400796115
## [990,] 0.521289167 0.545388671
## [991,] 1.622709072 1.549795100
## [992,] 0.540547471 0.628364243
## [993,] 0.936592571 0.728890151
## [994,] 0.644135902 1.178312756
## [995,] 5.814540325 2.380213668
## [996,] 0.729711853 0.605308385
## [997,] 1.143034688 1.463436023
## [998,] 0.031491714 0.538139930
## [999,] 0.801166035 0.540919898
##
## $model.matrix
##   (Intercept) avlength avcondition   T_av  O2_sat_av    Con_av COD_av NH4._av
## 1           1 46.26316  0.7032430 11.114   81.286  740.7140 13.333  0.158
## 2           1 38.30000  0.6196317 10.440   65.400  609.6000  1.400  0.774
## 3           1 47.20000  0.7209293 12.858   75.333  434.7500 25.917  2.251
## 4           1 33.60000  0.7279046 13.086   72.857  949.0000 25.000  5.000
## 5           1 33.30769  0.6910252 11.750   96.833  896.1670 14.000  0.303
## 6           1 35.05263  0.7161573 13.557   84.571  340.7140 29.000  0.252
## 7           1 35.53333  0.7532778 11.750   88.417  716.3330 16.583  0.393
## 9           1 41.66667  0.8590551 12.008   87.000  800.3330 21.917  0.468
## 11          1 39.89474  0.6943120 13.550   63.167  527.6670 45.500  3.233

```

```

## 12      1 32.90909  0.6629259 14.957   65.857 1089.8570 50.500  5.365
## 13      1 39.88235  0.7324076 14.486   90.429 771.7143 11.333  0.668
## 14      1 38.42857  0.7578120 11.983   77.667 472.3330 37.167  2.367
## 15      1 34.23077  0.7642545 11.577   85.308 591.4620 24.667  0.260
## 16      1 43.61111  0.6500428 12.443   87.857 462.5710 37.167  0.210
## 17      1 40.16667  0.7486984 11.425   73.250 470.3330 20.000  2.589
## 18      1 37.43750  0.9549238 16.214   61.000 422.4290 35.833  2.417
## 19      1 41.47059  0.6295888 9.317    94.900 812.8330 7.500   0.103
## 20      1 28.00000  0.7382850 12.957   85.571 851.2860 15.833  0.170
## 21      1 37.84211  0.74777438 15.000   85.333 673.1670 19.500  0.635
## 22      1 42.00000  0.6865490 10.475   73.833 255.8330 24.727  0.527
## 23      1 36.50000  0.7425513 10.050   80.000 138.6670 37.167  0.290
## 24      1 43.58333  0.8243429 11.773   66.091 593.0910 34.727  0.806
## 26      1 31.72222  0.8809334 12.167   80.333 897.4170 16.417  0.409
## 28      1 40.31579  0.7644699 13.433   99.667 801.0000 20.909  0.354
## 29      1 39.25000  0.8383703 14.133   87.667 669.6670 14.000  0.227
## 30      1 42.37500  0.7907723 13.542   48.833 542.4170 42.333  2.261
## 31      1 42.00000  0.8148913 12.867   70.333 447.3330 29.333  0.680
## 32      1 38.87500  0.6351264 13.186   91.857 617.5710 19.333  0.362
## 33      1 37.31579  0.7512399 15.233   84.000 539.3330 13.667  0.325
## 34      1 38.73684  0.6217274 12.050   92.583 659.8330 14.750  0.336
## 35      1 37.85714  0.8194431 11.175   91.375 687.3750 26.000  0.395
## 36      1 32.88889  0.6862546 13.700   88.833 755.5000 26.167  1.260
## 38      1 34.65000  0.6616806 13.633   77.500 667.0000 20.333  0.695
## 39      1 33.25000  0.7554143 11.333   43.750 848.3330 35.750  2.542
## 40      1 36.75000  0.6487052 12.900   71.400 635.0000 16.400  2.208
## 41      1 36.35000  0.8265861 15.100   94.000 716.3330 15.167  0.165
## 42      1 35.15789  0.7600249 13.786   89.571 705.7140 18.167  0.880

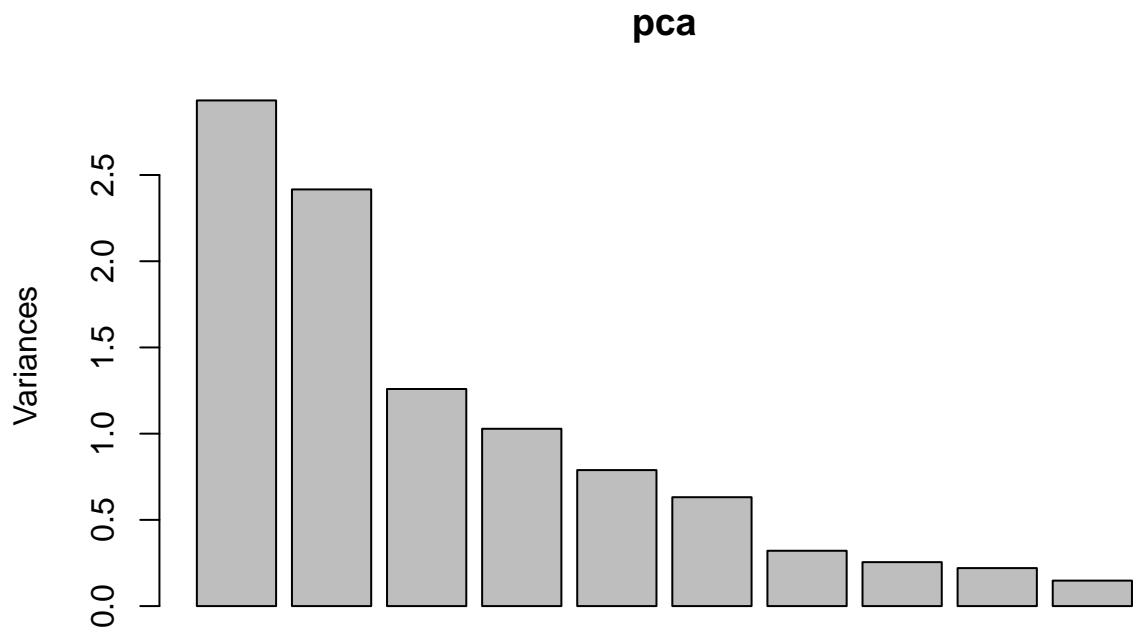
##          Nt_av pool_riffle1 meander1 netcen updist
## 1  8.917000      -1       -1 65212.97 67745.125
## 2  4.780000       1        1 50877.11 52437.119
## 3  8.925000       1        -1 38651.53 32574.449
## 4  9.067000      -1       -1 63911.70 65226.644
## 5  5.167000       1        -1 64168.17 67952.655
## 6  1.617000       1        1 45262.05 45780.074
## 7  2.775000       1        1 72386.11 76509.324
## 9  6.083000       1        -1 47724.46 49932.683
## 11 5.750000       1        1 49875.30 52217.733
## 12 16.100000     -1       -1 61880.37 26695.488
## 13 6.533000       1        1 60618.70 25511.682
## 14 7.000000       1        1 56056.62 15064.968
## 15 2.608000      -1       1 63687.75 67470.687
## 16 1.730000      -1       -1 68548.11 72561.660
## 17 10.617000     -1       -1 45271.82 39387.485
## 18 5.450000       1       -1 44142.92 15837.759
## 19 5.358361      -1       -1 64632.42 67396.486
## 20 4.583000       1       -1 72865.43 76898.411
## 21 5.067000      -1        1 58440.64 21751.460
## 22 2.164000       1        1 47879.02 44196.470
## 23 1.372000       1        1 53511.26 49989.625
## 24 4.891000       1       -1 37413.39 35027.425
## 26 5.242000       1        1 59347.24 62693.461
## 28 4.636000       1       -1 45740.16 46890.918
## 29 7.550000      -1       -1 73590.70 39137.994

```

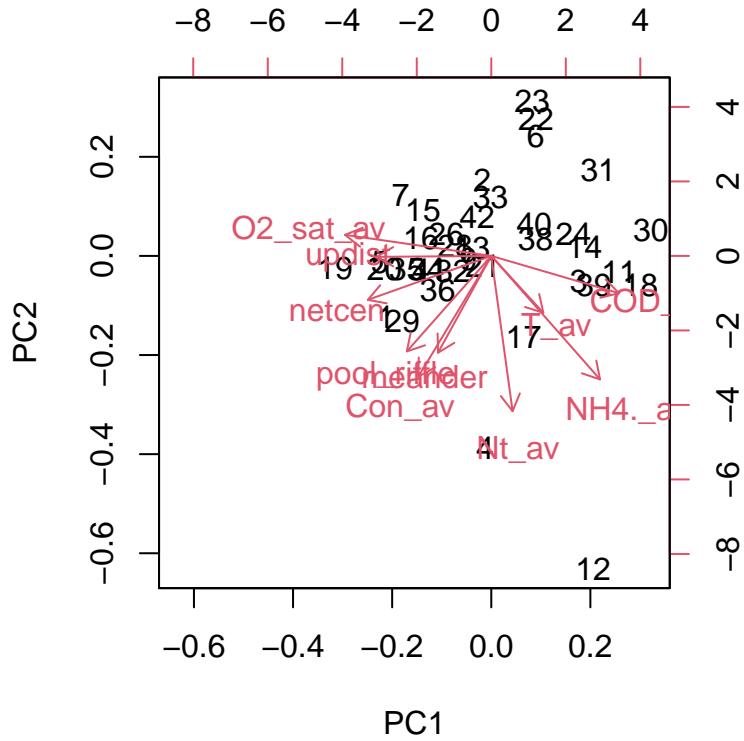
```

## 30 3.317000      1      1 45131.08 29684.138
## 31 3.283000      1      1 43713.21 2368.891
## 32 4.767000     -1     -1 55885.32 18797.654
## 33 3.683000      1      1 63398.00 26850.462
## 34 8.050000     -1      1 65158.98 30465.362
## 35 4.317000     -1     -1 59901.23 62281.614
## 36 5.567000     -1      1 63856.37 66416.408
## 38 7.033000      1      1 53189.12 16286.394
## 39 5.017000      1      1 63663.04 23736.389
## 40 3.243000      1      1 60384.21 20784.664
## 41 2.550000     -1     -1 60481.19 20943.659
## 42 3.450000      1      1 64836.74 25423.656
##
## $terms
## spe.hel_bray ~ avlength + avcondition + T_av + O2_sat_av + Con_av +
## COD_av + NH4._av + Nt_av + pool_riffle + meander + netcen +
## updist
## attr(,"variables")
## list(spe.hel_bray, avlength, avcondition, T_av, O2_sat_av, Con_av,
## COD_av, NH4._av, Nt_av, pool_riffle, meander, netcen, updist)
## attr(,"factors")
##           avlength avcondition T_av O2_sat_av Con_av COD_av NH4._av Nt_av
## spe.hel_bray      0        0    0    0    0    0    0    0
## avlength         1        0    0    0    0    0    0    0
## avcondition      0        1    0    0    0    0    0    0
## T_av             0        0    1    0    0    0    0    0
## O2_sat_av        0        0    0    1    0    0    0    0
## Con_av           0        0    0    0    1    0    0    0
## COD_av           0        0    0    0    0    1    0    0
## NH4._av          0        0    0    0    0    0    1    0
## Nt_av            0        0    0    0    0    0    0    1
## pool_riffle      0        0    0    0    0    0    0    0
## meander          0        0    0    0    0    0    0    0
## netcen           0        0    0    0    0    0    0    0
## updist           0        0    0    0    0    0    0    0
##           pool_riffle meander netcen updist
## spe.hel_bray      0        0    0    0
## avlength          0        0    0    0
## avcondition       0        0    0    0
## T_av              0        0    0    0
## O2_sat_av         0        0    0    0
## Con_av            0        0    0    0
## COD_av            0        0    0    0
## NH4._av           0        0    0    0
## Nt_av              0        0    0    0
## pool_riffle       1        0    0    0
## meander           0        1    0    0
## netcen            0        0    1    0
## updist            0        0    0    1
## attr(,"term.labels")
## [1] "avlength"     "avcondition" "T_av"          "O2_sat_av"   "Con_av"
## [6] "COD_av"        "NH4._av"      "Nt_av"        "pool_riffle"  "meander"
## [11] "netcen"        "updist"
## attr(,"order")

```

```
biplot(pca)
```



```
# Assess the effect of environmental variables on parasite component community dissimilarities using dbrda
spe.rda <- dbrda(spe.hel_bray ~ T_av + O2_sat_av + Con_av + COD_av
                  + NH4._av + Nt_av + pool_riffle + meander, data = env_select)
anova(spe.rda)
```

```
## Permutation test for dbrda under reduced model
## Permutation: free
## Number of permutations: 999
##
## Model: dbrda(formula = spe.hel_bray ~ T_av + O2_sat_av + Con_av + COD_av + NH4._av + Nt_av + pool_riffle + meander, data = env_select)
##          Df SumOfSqs      F Pr(>F)
## Model      8    1.1664 1.2909  0.159
## Residual  28    3.1624
```

```
RsquareAdj(spe.rda)$adj.r.squared
```

```
## [1] 0.06072755
```

```
mod0 <- dbrda(spe.hel_bray ~ 1, env_select[,-c(9:10)]) # Model with intercept only #edit_PH
mod1 <- dbrda(spe.hel_bray ~ ., env_select[,-c(9:10)]) # Model with all explanatory variables #edit_P
step.res <- ordiR2step(mod0, mod1, direction = "both", perm.max = 200)
```

```
## Step: R2.adj= 0
## Call: spe.hel_bray ~ 1
```

```

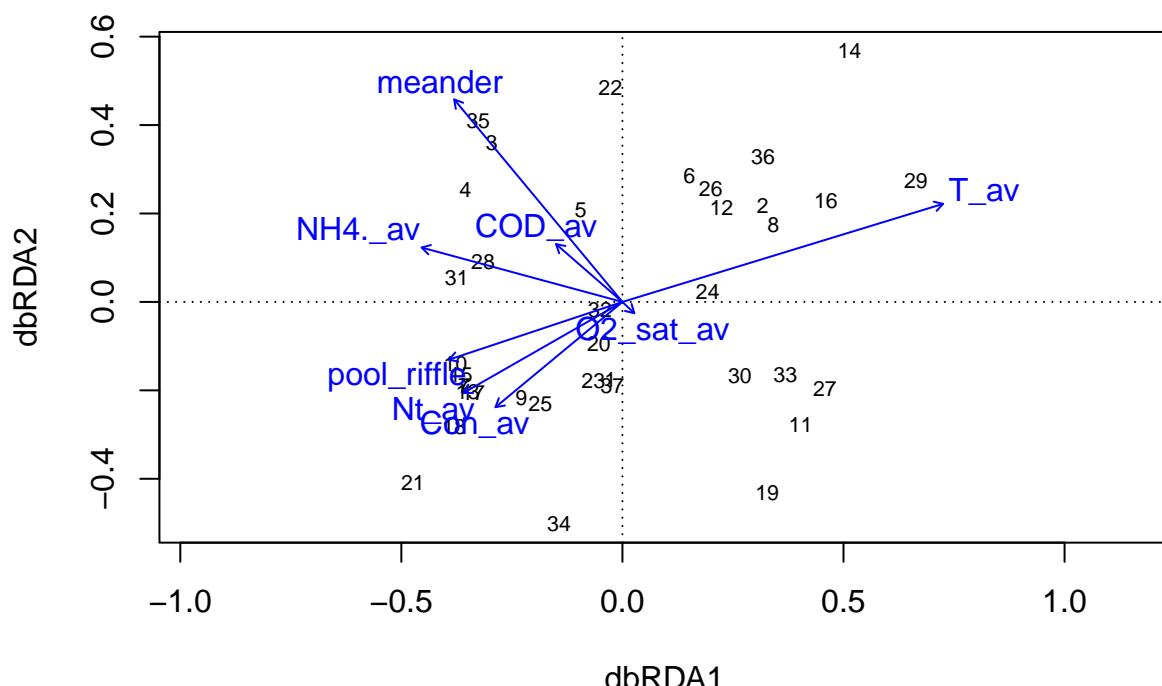
## R2.adjusted
## <All variables> 0.060727547
## + T_av 0.036398792
## + NH4._av 0.020208612
## + meander 0.018502880
## + O2_sat_av 0.004277611
## + Con_av 0.001872668
## + pool_riffle 0.001742860
## <none> 0.000000000
## + Nt_av -0.002060170
## + COD_av -0.017968936
##
## Df AIC F Pr(>F)
## + T_av 1 54.788 2.3599 0.066 .
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```
step.res$anova # Summary table
```

```
## NULL
```

```
plot(spe.rda, scaling = 1) # it is for technical reasons not possible to plot both site and species scores
```



```

summary(spe.rda)

##
## Call:
## dbrda(formula = spe.hel_bray ~ T_av + O2_sat_av + Con_av + COD_av + NH4._av + Nt_av + pool_riff)
##
## Partitioning of squared Bray distance:
##           Inertia Proportion
## Total      4.329    1.0000
## Constrained 1.166    0.2695
## Unconstrained 3.162    0.7305
##
## Eigenvalues, and their contribution to the squared Bray distance
##
## Importance of components:
##           dbRDA1 dbRDA2 dbRDA3 dbRDA4 dbRDA5 dbRDA6
## Eigenvalue 0.5740 0.3372 0.17566 0.09415 0.042525 0.0020670
## Proportion Explained 0.1326 0.0779 0.04058 0.02175 0.009824 0.0004775
## Cumulative Proportion NA NA NA NA NA NA
##           idbRDA1 idbRDA2 MDS1 MDS2 MDS3 MDS4 MDS5
## Eigenvalue -0.014797 -0.04441 1.3249 0.8027 0.4680 0.31323 0.29121
## Proportion Explained 0.003418 0.01026 0.3061 0.1854 0.1081 0.07236 0.06727
## Cumulative Proportion NA NA NA NA NA NA NA
##           MDS6 MDS7 MDS8 MDS9 MDS10 MDS11 MDS12
## Eigenvalue 0.13644 0.11438 0.08987 0.07065 0.06425 0.02766 0.01576
## Proportion Explained 0.03152 0.02642 0.02076 0.01632 0.01484 0.00639 0.00364
## Cumulative Proportion NA NA NA NA NA NA NA
##           MDS13 MDS14 iMDS1 iMDS2 iMDS3
## Eigenvalue 0.011872 2.725e-04 -0.0020314 -0.007356 -0.01078
## Proportion Explained 0.002743 6.295e-05 0.0004693 0.001699 0.00249
## Cumulative Proportion NA NA NA NA NA NA
##           iMDS4 iMDS5 iMDS6 iMDS7 iMDS8 iMDS9
## Eigenvalue -0.014744 -0.01935 -0.022495 -0.029849 -0.03342 -0.041489
## Proportion Explained 0.003406 0.00447 0.005197 0.006895 0.00772 0.009584
## Cumulative Proportion NA NA NA NA NA NA
##           iMDS10 iMDS11 iMDS12 iMDS13 iMDS14
## Eigenvalue -0.05984 -0.06439 -0.06995 -0.09116 -0.10203
## Proportion Explained 0.01382 0.01487 0.01616 0.02106 0.02357
## Cumulative Proportion NA NA NA NA NA
##
## Accumulated constrained eigenvalues
## Importance of components:
##           dbRDA1 dbRDA2 dbRDA3 dbRDA4 dbRDA5 dbRDA6 idbRDA1
## Eigenvalue 0.5740 0.3372 0.1757 0.09415 0.04252 0.002067 -0.01480
## Proportion Explained 0.4921 0.2891 0.1506 0.08072 0.03646 0.001772 0.01269
## Cumulative Proportion NA NA NA NA NA NA NA
##           idbRDA2
## Eigenvalue -0.04441
## Proportion Explained 0.03807
## Cumulative Proportion NA
##
## Scaling 2 for species and site scores
## * Species are scaled proportional to eigenvalues

```

```

## * Sites are unscaled: weighted dispersion equal on all dimensions
## * General scaling constant of scores: 3.533199
##
##
## Site scores (weighted sums of species scores)
##
##      dbRDA1   dbRDA2   dbRDA3   dbRDA4   dbRDA5   dbRDA6
## 1 -0.07530 -0.62580 -0.63602 -2.643196 -0.34427 -23.8946
## 2  0.87242  0.77832 -0.32068  2.074749 -0.25800  41.3754
## 3 -0.81094  1.29200 -0.57735 -0.708420 -2.35800 -5.0035
## 4 -0.97450  0.91051  1.79849 -2.192492 -1.99248 -4.7134
## 5 -0.25889  0.74559 -1.30995 -1.418227  0.33185 -21.9720
## 6  0.41640  1.01888 -0.34551 -2.318324  1.61924 -24.8949
## 7 -0.98286 -0.67495  0.62017  1.174218  1.55155 -0.8974
## 8  0.93807  0.62635 -3.10878 -0.765073  2.41981 -3.0764
## 9 -0.62816 -0.77245 -1.30540  1.806170  1.30543 -41.2679
## 10 -1.03727 -0.50089  0.62572  0.369727  1.00378  4.7819
## 11  1.10743 -0.99448 -0.66515 -0.071830  0.83402 -14.8528
## 12  0.61624  0.76828  0.87110  0.357836  0.12125  38.2552
## 13 -0.96088 -0.72453  0.47977  1.569869  1.43399 -6.8692
## 14  1.41128  2.03453 -1.67256  0.776255  0.27648  29.9435
## 15 -1.00448 -0.59302  0.65010  0.833950  1.44643  3.4902
## 16  1.26382  0.81623  3.19230  1.380128  1.12523 -10.4959
## 17 -0.92726 -0.73637  0.33774  1.892276  1.07787 -8.2400
## 18 -1.04523 -1.01280 -0.59052  2.897871  0.35870 -14.2865
## 19  0.89987 -1.54255 -0.54435  1.738188 -2.61939  32.8867
## 20 -0.14608 -0.34079  0.78630  1.316880  1.70249 -9.1246
## 21 -1.30124 -1.46318 -1.27370  3.739798  0.91928 -16.7232
## 22 -0.07485  1.73636  0.30728 -1.760677 -0.46041  6.1504
## 23 -0.18008 -0.64105  0.55428 -1.310793 -0.82437 -3.6579
## 24  0.53054  0.08088  1.31623 -3.529128 -1.96164  41.6937
## 25 -0.50901 -0.82222 -1.26480  2.167458 -6.71178 -22.4535
## 26  0.54874  0.92050  1.12409  0.009258  0.07714  34.0773
## 27  1.25804 -0.69768  2.37255 -1.697654 -3.24936 -16.2349
## 28 -0.86554  0.32492 -0.68347  0.704689 -0.16329  13.0277
## 29  1.82276  0.98120  0.33891 -1.852448  4.33581 -8.6587
## 30  0.72974 -0.59907 -1.00943 -0.201449  1.77124 -4.5186
## 31 -1.02904  0.19515  1.05102 -1.468951 -1.36610  23.1359
## 32 -0.13877 -0.06050 -0.19569 -1.899083 -1.10403 -31.4856
## 33  1.01209 -0.59332  2.58400 -0.318337 -1.43566  39.0635
## 34 -0.39319 -1.79743  0.20497 -0.362972 -0.59693 -19.8004
## 35 -0.89506  1.46497 -0.05622 -1.876722 -1.86120  3.5844
## 36  0.87386  1.17335 -3.50567  1.196922  1.51036 -9.4970
## 37 -0.06267 -0.67495 -0.14975  0.389535  2.08495  11.1529
##
##
## Site constraints (linear combinations of constraining variables)
##
##      dbRDA1   dbRDA2   dbRDA3   dbRDA4   dbRDA5   dbRDA6
## 1 -0.16605 -0.69736 -0.45052  0.39949 -1.140870  0.26766
## 2 -0.07683 -0.33692  0.61638  0.50606 -0.381728  1.66676
## 3 -0.10071  0.76299  0.51759  0.02910  0.003366 -0.26259
## 4 -1.55548  0.90013  0.66933 -0.51241 -0.415318 -0.13093
## 5 -0.41914  0.27994 -0.66104 -1.10909  0.384267  0.50060

```

```

## 6   0.63090  0.30135 -0.07724  0.37780  0.857007 -0.33310
## 7  -0.15252 -0.25647 -0.20458 -0.38652  0.792931  0.48033
## 8  -0.14874  0.12938 -0.39866 -0.78891  0.083814  0.27677
## 9  -0.14359  0.11628  0.95439 -0.04629  0.609992 -0.64671
## 10 -0.74154 -0.65088  0.87072 -1.17151 -0.875610 -1.73263
## 11  0.77571 -0.48314  0.02321 -0.76003  0.259283 -0.01494
## 12 -0.44387 -0.28442  0.54938 -0.01813  1.062736 -0.71676
## 13 -0.25608 -0.61494 -0.47847  0.74269  0.180828 -0.14346
## 14 -0.23636  0.67472 -0.87185  0.72759  0.046993 -0.61306
## 15 -0.75508  0.19781  0.41035  0.89449 -0.744271 -0.25040
## 16  0.97946  1.50039  0.74911  0.12808 -0.657115 -0.30363
## 17 -1.19679 -0.18091 -0.90174  0.16093 -0.229189  0.70454
## 18  0.23197  0.39183 -0.42932 -0.82808 -0.242760  0.64991
## 19  0.80868 -0.55920 -0.22435  0.32426 -0.445610 -0.51746
## 20 -0.19206  0.12003  0.24728  0.99541  0.747110  0.40576
## 21 -0.38477  0.09371 -0.03632  1.07969  1.383306 -0.25819
## 22  0.02352  0.34014  0.07462  0.03662 -0.352806  0.35626
## 23  0.18716 -0.91860 -0.02126 -0.69548  0.117329  0.60753
## 24  0.03851  0.57991 -0.70662 -1.10691  0.533700 -0.10095
## 25  0.61401 -0.01017 -0.51875  0.25795 -1.076732 -0.24901
## 26  0.42275  0.07490  0.99168  0.37950 -0.249480  0.19511
## 27  0.54478 -0.12356  0.31406  0.41569  0.237094  0.09772
## 28  0.02044  0.43106 -0.71781  0.33274 -0.428303 -0.26278
## 29  1.23235  0.15293  0.10463 -0.07285  0.107338  0.07885
## 30  0.02214 -1.33353 -0.37271  0.38762 -0.062960 -0.48751
## 31 -0.71637  0.11204 -0.85950  0.24734 -0.066602 -0.17455
## 32  0.01756 -0.71899 -0.27770  0.01727  0.106473 -0.73172
## 33  0.78296 -0.75806  0.27650 -0.27767 -0.031297 -0.01895
## 34 -0.33590 -0.63554  1.07989 -0.07860 -0.526645  0.97933
## 35 -0.15761  0.49842  0.66426 -0.05091  0.331527  0.71522
## 36  0.53360  0.88375 -0.84613  0.03571 -0.630019 -0.08456
## 37  0.31300  0.02099 -0.05877 -0.57261  0.712218  0.05155
##
##
## Biplot scores for constraining variables
##
##          dbRDA1   dbRDA2   dbRDA3   dbRDA4   dbRDA5   dbRDA6
## T_av      0.63982  0.25527  0.1662 -0.34674 -0.2289 -0.48193
## O2_sat_av  0.02371 -0.02938 -0.8854 -0.18557  0.2035 -0.13356
## Con_av    -0.25315 -0.27391 -0.1407 -0.76998 -0.4264  0.07657
## COD_av    -0.13235  0.15034  0.4807  0.08407  0.1430 -0.57341
## NH4._av   -0.40051  0.14159  0.7569 -0.21438 -0.2051 -0.37005
## Nt_av     -0.31714 -0.23687  0.2952 -0.33830 -0.5347 -0.40917
## pool_riffle -0.34609 -0.15029 -0.4384  0.27287 -0.5547 -0.42271
## meander   -0.33563  0.52703 -0.3800 -0.21165 -0.5422 -0.13159

anova(spe.rda)

## Permutation test for dbrda under reduced model
## Permutation: free
## Number of permutations: 999
##
## Model: dbrda(formula = spe.hel_bray ~ T_av + O2_sat_av + Con_av + COD_av + NH4._av + Nt_av + pool_ri
##              Df SumOfSqs      F Pr(>F)

```

```

## Model      8   1.1664 1.2909  0.141
## Residual  28   3.1624

anova(spe.rda, by="term")

## Permutation test for dbrda under reduced model
## Terms added sequentially (first to last)
## Permutation: free
## Number of permutations: 999
##
## Model: dbrda(formula = spe.hel_bray ~ T_av + O2_sat_av + Con_av + COD_av + NH4._av + Nt_av + pool_rif
##                 Df SumOfSqs      F Pr(>F)
## T_av          1   0.2734 2.4210  0.039 *
## O2_sat_av    1   0.1377 1.2195  0.335
## Con_av        1   0.1613 1.4283  0.225
## COD_av        1   0.0676 0.5990  0.692
## NH4._av       1   0.1709 1.5131  0.220
## Nt_av         1   0.0501 0.4439  0.785
## pool_riffle   1   0.0657 0.5818  0.682
## meander       1   0.2396 2.1210  0.075 .
## Residual     28   3.1624
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

anova.cca(spe.rda, step=1000);

## Permutation test for dbrda under reduced model
## Permutation: free
## Number of permutations: 999
##
## Model: dbrda(formula = spe.hel_bray ~ T_av + O2_sat_av + Con_av + COD_av + NH4._av + Nt_av + pool_rif
##                 Df SumOfSqs      F Pr(>F)
## Model      8   1.1664 1.2909  0.185
## Residual  28   3.1624

anova.cca(spe.rda, step=1000, by="term");

## Permutation test for dbrda under reduced model
## Terms added sequentially (first to last)
## Permutation: free
## Number of permutations: 999
##
## Model: dbrda(formula = spe.hel_bray ~ T_av + O2_sat_av + Con_av + COD_av + NH4._av + Nt_av + pool_rif
##                 Df SumOfSqs      F Pr(>F)
## T_av          1   0.2734 2.4210  0.048 *
## O2_sat_av    1   0.1377 1.2195  0.307
## Con_av        1   0.1613 1.4283  0.200
## COD_av        1   0.0676 0.5990  0.688
## NH4._av       1   0.1709 1.5131  0.203
## Nt_av         1   0.0501 0.4439  0.792
## pool_riffle   1   0.0657 0.5818  0.697
## meander       1   0.2396 2.1210  0.069 .

```

```

## Residual      28   3.1624
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

RsquareAdj(spe.rda)$adj.r.squared;

## [1] 0.06072755

RsquareAdj(spe.rda)$r.squared

## [1] 0.2694548

```

8.1.2 Effect of space on component community structure

```

# Same for spatial predictors
spe.rda <- dbrda(spe.hel_bray ~ netcen + updist, data = env_select)
anova(spe.rda)

## Permutation test for dbrda under reduced model
## Permutation: free
## Number of permutations: 999
##
## Model: dbrda(formula = spe.hel_bray ~ netcen + updist, data = env_select)
##          Df SumOfSqs      F Pr(>F)
## Model      2    0.5154 2.2975  0.028 *
## Residual  34    3.8135
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

RsquareAdj(spe.rda)$adj.r.squared

## [1] 0.06723433

mod0 <- dbrda(spe.hel_bray ~ 1, env_select[,c(9:10)])  # Model with intercept only #edit_PH
mod1 <- dbrda(spe.hel_bray ~ ., env_select[,c(9:10)])  # Model with all explanatory variables #edit_PH
step.res <- ordiR2step(mod0, mod1, direction = "both", perm.max = 200)

## Step: R2.adj= 0
## Call: spe.hel_bray ~ 1
##
##          R2.adjusted
## <All variables> 0.06723433
## + updist         0.04867127
## + netcen         0.04317133
## <none>           0.00000000
##
##          Df      AIC      F Pr(>F)
## + updist  1 54.314 2.8418  0.014 *

```

```

## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Step: R2.adj= 0.04867127
## Call: spe.hel_bray ~ updist
##
##          R2.adjusted
## + netcen      0.06723433
## <All variables> 0.06723433
## <none>        0.04867127

```

```
step.res$anova # Summary table
```

```

##          R2.adj Df     AIC      F Pr(>F)
## + updist    0.048671  1 54.314 2.8418  0.014 *
## <All variables> 0.067234
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```
RsquareAdj(spe.rda)$adj.r.squared
```

```
## [1] 0.06723433
```

```
anova.cca(spe.rda, step=1000);
```

```

## Permutation test for dbrda under reduced model
## Permutation: free
## Number of permutations: 999
##
## Model: dbrda(formula = spe.hel_bray ~ netcen + updist, data = env_select)
##          Df SumOfSqs      F Pr(>F)
## Model      2   0.5154 2.2975  0.027 *
## Residual  34   3.8135
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```
anova.cca(spe.rda, step=1000, by="term");
```

```

## Permutation test for dbrda under reduced model
## Terms added sequentially (first to last)
## Permutation: free
## Number of permutations: 999
##
## Model: dbrda(formula = spe.hel_bray ~ netcen + updist, data = env_select)
##          Df SumOfSqs      F Pr(>F)
## netcen     1   0.3019 2.6920  0.035 *
## updist     1   0.2134 1.9029  0.106
## Residual  34   3.8135
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```
RsquareAdj(spe.rda)$adj.r.squared;
```

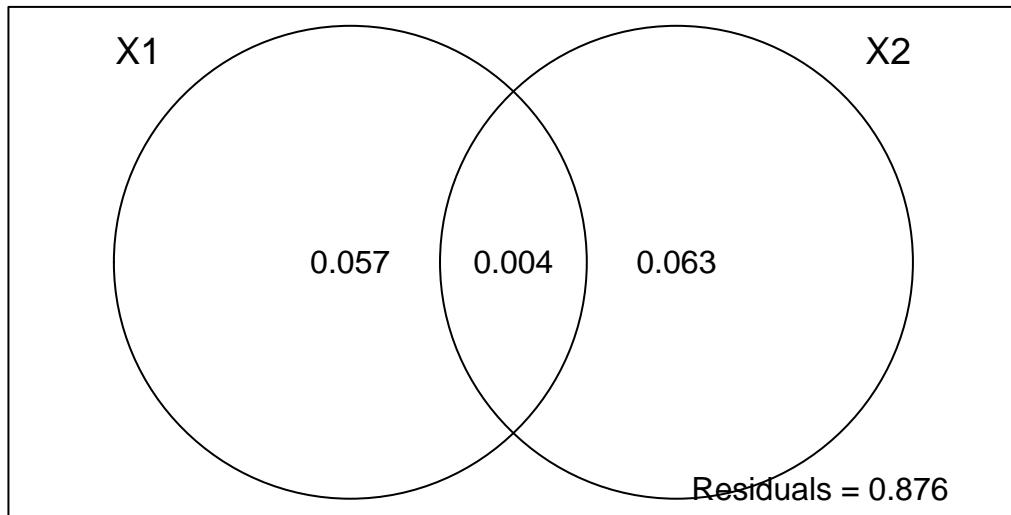
```
## [1] 0.06723433
```

```
RsquareAdj(spe.rda)$r.squared
```

```
## [1] 0.1190546
```

8.1.3 Variation partitioning

```
#Variation partitioning  
spe.varpart1 <- varpart(spe.hel_bray, env_select[,1:8], env_select[,9:10])  
plot(spe.varpart1,digits=2)
```



```
spe.varpart1
```

```
##  
## Partition of squared Bray distance in dbRDA  
##  
## Call: varpart(Y = spe.hel_bray, X = env_select[, 1:8], env_select[,  
## 9:10])
```

```

## 
## Explanatory tables:
## X1: env_select[, 1:8]
## X2: env_select[, 9:10]
##
## No. of explanatory tables: 2
## Total variation (SS): 4.3288
## No. of observations: 37
##
## Partition table:
##                               Df R.squared Adj.R.squared Testable
## [a+c] = X1                 8   0.26945     0.06073    TRUE
## [b+c] = X2                 2   0.11905     0.06723    TRUE
## [a+b+c] = X1+X2            10  0.36716     0.12376    TRUE
## Individual fractions
## [a] = X1|X2                8           0.05653    TRUE
## [b] = X2|X1                2           0.06303    TRUE
## [c]                         0           0.00420   FALSE
## [d] = Residuals             0           0.87624   FALSE
## ---
## Use function 'dbrda' to test significance of fractions of interest

anova.cca(dbrda(spe.hel_bray ~ T_av + O2_sat_av + Con_av + COD_av
                  + NH4._av + Nt_av + pool_riffle + meander + Condition(netcen + updist),
                  data=env_select), step=1000)

## Permutation test for dbrda under reduced model
## Permutation: free
## Number of permutations: 999
##
## Model: dbrda(formula = spe.hel_bray ~ T_av + O2_sat_av + Con_av + COD_av + NH4._av + Nt_av + pool_riffle + meander + Condition(netcen + updist),
##               Df SumOfSqs      F Pr(>F))
## Model      8   1.0740  1.2742  0.175
## Residual  26   2.7395

anova.cca(dbrda(spe.hel_bray ~ netcen + updist +
                  Condition(T_av + O2_sat_av + Con_av + COD_av
                  + NH4._av + Nt_av + pool_riffle + meander), data=env_select), step=1000)

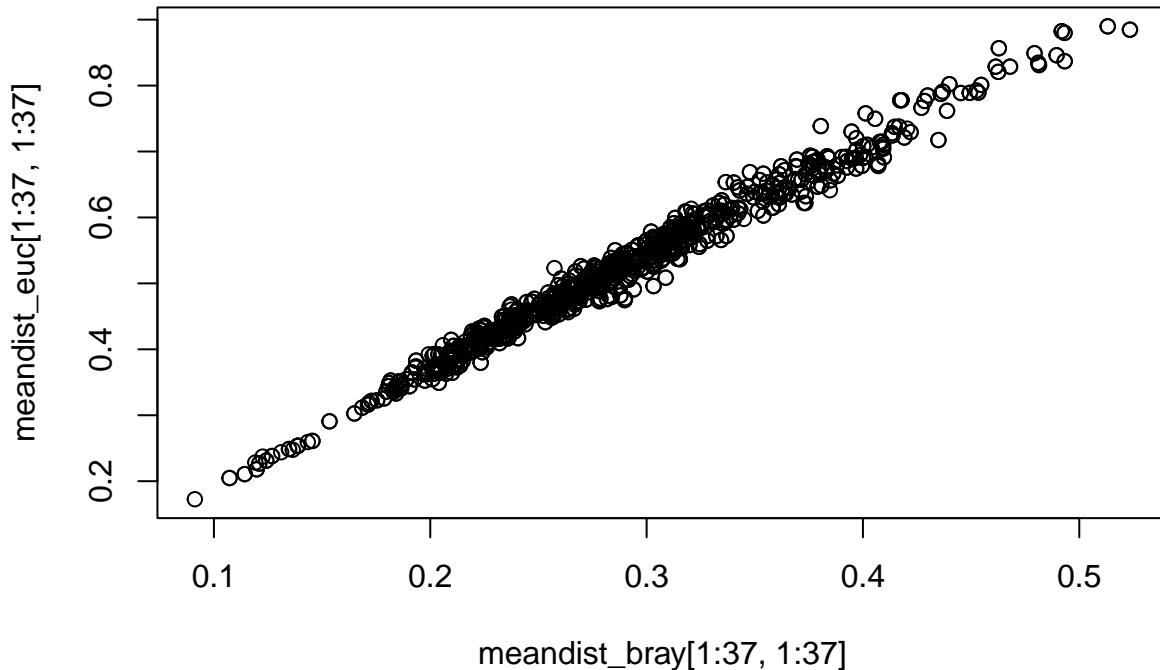
## Permutation test for dbrda under reduced model
## Permutation: free
## Number of permutations: 999
##
## Model: dbrda(formula = spe.hel_bray ~ netcen + updist + Condition(T_av + O2_sat_av + Con_av + COD_av
##               Df SumOfSqs      F Pr(>F))
## Model      2   0.42295  2.0071  0.049 *
## Residual  26   2.73945
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ',' 1

```

8.2 Infra-communities

```
# Infracommunities: Bray-Curtis dissimilarities are calculated at the individual host level Hellinger-transformed
# A dummy parasite species is added to avoid problems with non-infected fishes
data_infra <- na.omit(data[,c(1,22:24,26:32)])
data_infra_disp <- dispweight(data_infra[,-1])
braycurtis <- vegdist(decostand(cbind(data_infra_disp,rep(1,nrow(data_infra)))), na.rm=T, method="hellinger")
meandist_bray <- meandist(braycurtis, data_infra[,1])

# Check whether Euclidean and Bray-Curtis distances are comparable
braycurtis <- vegdist(decostand(cbind(data_infra_disp,rep(1,nrow(data_infra)))), na.rm=T, method="hellinger")
meandist_bray <- meandist(braycurtis, data_infra[,1])
euc <- vegdist(decostand(cbind(data_infra_disp,rep(1,nrow(data_infra)))), na.rm=T, method="hellinger"), na.rm=T)
meandist_euc <- meandist(euc, data_infra[,1])
plot(meandist_bray[1:37,1:37], meandist_euc[1:37,1:37])
```



```
mantel(meandist_bray[1:37,1:37], meandist_euc[1:37,1:37])
```

```
##
## Mantel statistic based on Pearson's product-moment correlation
##
## Call:
## mantel(xdis = meandist_bray[1:37, 1:37], ydis = meandist_euc[1:37,
## 1:37])
##
```

```

## Mantel statistic r: 0.9906
##      Significance: 0.001
##
## Upper quantiles of permutations (null model):
##   90%   95% 97.5%   99%
## 0.197 0.260 0.301 0.352
## Permutation: free
## Number of permutations: 999

adonis(meandist_bray ~ avlength + avcondition + T_av + O2_sat_av + Con_av + COD_av
       + NH4._av + Nt_av + pool_riffle + meander + netcen +
       updist, data=environment2)

## 'adonis' will be deprecated: use 'adonis2' instead

## $aov.tab
## Permutation: free
## Number of permutations: 999
##
## Terms added sequentially (first to last)
##
##           Df  SumsofSqs  MeanSqs F.Model      R2 Pr(>F)
## avlength     1  0.05123  0.051226  6.1160 0.11570  0.006 **
## avcondition  1  0.00393  0.003927  0.4688 0.00887  0.617
## T_av         1  0.00874  0.008741  1.0437 0.01974  0.368
## O2_sat_av    1  0.02116  0.021158  2.5262 0.04779  0.093 .
## Con_av       1  0.05861  0.058606  6.9971 0.13237  0.003 **
## COD_av       1  0.03543  0.035428  4.2298 0.08002  0.034 *
## NH4._av      1  0.00275  0.002754  0.3288 0.00622  0.689
## Nt_av         1  0.01049  0.010488  1.2521 0.02369  0.305
## pool_riffle  1  0.00491  0.004914  0.5867 0.01110  0.592
## meander       1  0.00959  0.009588  1.1447 0.02166  0.325
## netcen        1  0.02319  0.023187  2.7684 0.05237  0.087 .
## updist        1  0.01171  0.011707  1.3977 0.02644  0.244
## Residuals    24  0.20102  0.008376          0.45403
## Total         36  0.44274                  1.00000
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## $call
## adonis(formula = meandist_bray ~ avlength + avcondition + T_av +
##         O2_sat_av + Con_av + COD_av + NH4._av + Nt_av + pool_riffle +
##         meander + netcen + updist, data = environment2)
##
## $coefficients
## NULL
##
## $coef.sites
##           [,1]          [,2]          [,3]          [,4]
## (Intercept) 5.438577e-01 -7.521287e-02  4.864790e-01  2.572596e-01
## avlength    -6.884388e-03 -1.280466e-03 -5.827549e-03 -1.940029e-03
## avcondition -9.453108e-02  4.976498e-02 -1.367366e-01 -1.391442e-01
## T_av        2.507095e-03  3.945903e-03  2.216001e-03  1.001131e-02

```

```

## 02_sat_av      1.097888e-03  1.797618e-03 -5.251344e-04 -9.855585e-04
## Con_av        1.252067e-04  1.767804e-04  2.866100e-04  6.899238e-05
## COD_av        2.766346e-03  5.270287e-03  4.180377e-03  3.645643e-03
## NH4._av       -3.209605e-03 -1.389345e-02 -2.435426e-02 -4.858725e-02
## Nt_av         -2.834506e-03  2.998526e-03  2.117586e-03  1.084555e-02
## pool_riffle1 -1.054452e-02 -1.173617e-02 -2.662374e-02 -5.705720e-03
## meander1      5.668373e-03  8.189203e-03  1.673440e-02  5.970137e-03
## netcen        -2.142602e-06 -2.167154e-07 -2.066516e-06  2.110136e-07
## updist        -1.536592e-06 -1.364493e-06 -1.425078e-06 -1.036735e-06
##                  [,5]          [,6]          [,7]          [,8]
## (Intercept)   1.859992e-01  9.431975e-02  5.239507e-01  7.121103e-01
## avlength     -9.061148e-04  9.115535e-04 -3.388699e-03 -4.874516e-03
## avcondition  -2.246177e-02  1.242866e-02 -1.607023e-01 -2.930291e-01
## T_av          9.855242e-03 -7.934316e-04  8.314717e-03  1.226973e-02
## 02_sat_av    -8.737335e-04 -5.764731e-04 -6.922634e-04 -1.430875e-03
## Con_av        7.929827e-05  1.627319e-04  1.178433e-04 -8.169731e-06
## COD_av        2.620073e-03  2.450642e-03  2.425527e-03  1.291031e-03
## NH4._av       -2.383806e-02 -1.545591e-02 -2.488679e-02 -1.121646e-02
## Nt_av         6.508375e-03  4.792203e-03  3.250168e-03  1.733526e-03
## pool_riffle1 -2.181549e-02 -1.025280e-02 -2.009409e-02 -2.039528e-02
## meander1      1.696135e-02  5.007047e-03 -1.235392e-04  5.064015e-03
## netcen        -6.091881e-07  1.199733e-06 -2.636603e-06 -2.423047e-07
## updist        -8.547704e-07 -1.413130e-06 -1.292494e-06 -6.716768e-07
##                  [,9]          [,10]         [,11]         [,12]
## (Intercept)   4.024582e-01  1.430932e-01  7.114198e-01  5.253185e-01
## avlength     -1.263684e-03  6.480256e-03 -6.097911e-03 -1.568750e-03
## avcondition  6.327768e-02  2.153909e-01 -1.325121e-01 -2.083399e-01
## T_av          2.158539e-03  7.436242e-03  6.761999e-04  2.230340e-02
## 02_sat_av   -1.641426e-04 -9.153827e-05 -1.008227e-03 -2.435431e-03
## Con_av        -8.718723e-06 -2.085945e-04  1.217167e-04  1.006248e-04
## COD_av        -3.012411e-04 -3.782117e-03  2.998923e-03  1.207333e-04
## NH4._av       -1.764703e-02  7.858097e-04 -1.745848e-02 -2.775773e-02
## Nt_av         7.561367e-04 -9.554883e-03 -6.117636e-05 -1.001816e-03
## pool_riffle1 -6.407395e-03  1.052973e-02 -2.562772e-02 -2.466499e-02
## meander1     -9.101494e-03 -6.934907e-03 -6.056336e-03 -5.635160e-03
## netcen        -6.643610e-07  7.643835e-07 -2.271691e-06 -2.617159e-06
## updist        -1.278343e-06  1.330479e-07 -7.875475e-07  9.160172e-07
##                  [,13]         [,14]         [,15]         [,16]
## (Intercept)   3.672792e-01  6.122057e-01  2.184547e-02  3.964502e-01
## avlength     -2.868565e-03 -7.576375e-03  1.666613e-03 -4.641591e-04
## avcondition -1.957521e-01  7.839817e-02 -1.507661e-01 -2.834975e-01
## T_av          6.543640e-03 -3.778705e-03  1.269910e-02 -6.279850e-03
## 02_sat_av   -1.983972e-04  1.375183e-04 -1.235877e-04  8.722842e-04
## Con_av        2.378346e-04  2.064674e-04  1.856637e-04  2.705789e-04
## COD_av        3.321870e-03  1.401488e-03  3.425972e-03  3.598149e-03
## NH4._av       -1.721518e-02 -1.323472e-02 -2.514115e-02 -1.960661e-02
## Nt_av         3.107012e-03  9.907581e-03 -2.455106e-03  2.484041e-03
## pool_riffle1 -8.535036e-03 -1.634315e-02  2.783916e-03 -1.866677e-02
## meander1      5.367622e-03  2.477360e-02  8.039477e-03  2.416684e-02
## netcen        -2.042112e-06 -3.535570e-06  1.554878e-07 -1.256661e-06
## updist        -1.439341e-06 -1.338057e-06 -9.098917e-07 -9.217761e-07
##                  [,17]         [,18]         [,19]         [,20]
## (Intercept)   2.493115e-01  8.152537e-02  3.929447e-01  3.545752e-01
## avlength     -2.521561e-03  3.450389e-03 -2.006019e-03 -4.380332e-03

```

```

## avcondition -5.535822e-02 3.380327e-02 -7.982891e-02 -1.249622e-01
## T_av 1.577542e-02 1.829433e-03 -3.257684e-03 5.842857e-03
## O2_sat_av -3.670857e-04 1.115173e-03 1.586402e-04 -2.732561e-04
## Con_av 9.029447e-05 1.690298e-04 3.073729e-05 2.848146e-04
## COD_av 2.382621e-03 1.725383e-03 2.016596e-03 3.868612e-03
## NH4._av -1.804147e-02 3.178641e-03 -4.612758e-03 -2.216283e-02
## Nt_av 3.863537e-03 -2.837115e-03 2.887095e-03 3.626124e-03
## pool_riffle1 -6.032976e-03 -2.395194e-02 1.614506e-02 -2.226198e-02
## meander1 9.922600e-03 2.575902e-02 -1.634898e-02 1.245716e-02
## netcen -2.083832e-06 -2.868632e-06 3.331980e-07 -2.097165e-06
## updist -6.410051e-07 -1.222135e-06 -5.676478e-07 -1.325414e-06
## [,21] [,22] [,23] [,24]
## (Intercept) 3.775391e-01 1.503970e-01 2.250218e-01 4.573949e-01
## avlength -2.398519e-03 -2.089041e-03 1.704741e-03 -4.205541e-03
## avcondition -1.783264e-01 -7.805221e-02 -2.415759e-01 -7.956202e-02
## T_av 8.668038e-03 9.723828e-03 1.330985e-02 3.519712e-03
## O2_sat_av -5.721243e-04 1.421863e-04 -3.206484e-04 -1.767363e-03
## Con_av 3.611625e-04 -1.233660e-05 -8.074887e-05 7.022169e-05
## COD_av 3.063339e-03 1.594269e-03 1.418966e-03 2.592955e-03
## NH4._av -1.613161e-02 -1.470376e-02 -1.487983e-02 -2.498722e-02
## Nt_av 1.587171e-04 7.708938e-03 1.771918e-03 7.708403e-03
## pool_riffle1 -2.435808e-02 -8.033741e-03 3.562517e-04 -2.123952e-02
## meander1 1.578138e-02 1.091345e-02 -1.620349e-02 9.757328e-03
## netcen -3.310124e-06 1.502106e-06 1.297669e-06 7.740343e-07
## updist -1.271056e-06 -5.708792e-07 -8.476200e-07 -1.029088e-06
## [,25] [,26] [,27] [,28]
## (Intercept) 6.034100e-01 4.057286e-01 3.512245e-01 -6.049687e-02
## avlength -4.026509e-03 -5.057274e-03 -3.273197e-03 1.120816e-03
## avcondition -2.587040e-01 -4.526089e-02 -1.880925e-01 1.101614e-01
## T_av 2.666839e-03 -1.252435e-03 1.171091e-02 1.113716e-02
## O2_sat_av 4.608734e-04 1.746840e-03 -4.150943e-04 -2.836705e-04
## Con_av 2.772668e-04 -3.149822e-05 2.057587e-05 1.134627e-05
## COD_av 3.414552e-03 8.643396e-04 1.701807e-03 1.467592e-03
## NH4._av -8.437314e-03 -9.353963e-03 -1.221150e-02 -1.507347e-02
## Nt_av -3.042008e-03 8.250434e-03 6.560634e-03 7.856403e-03
## pool_riffle1 -1.612736e-02 -2.304926e-03 -4.697692e-03 2.871501e-03
## meander1 1.555900e-02 -6.834422e-03 -6.892891e-03 1.670464e-02
## netcen -4.516532e-06 6.536252e-08 4.178064e-07 -1.139741e-07
## updist -1.004042e-06 -8.459542e-07 5.086260e-07 1.580361e-07
## [,29] [,30] [,31] [,32]
## (Intercept) 5.411230e-01 2.798404e-01 2.012307e-01 1.754865e-01
## avlength -5.499696e-03 -1.806170e-03 6.207745e-04 3.526583e-03
## avcondition -1.657150e-01 -2.368554e-02 -1.803869e-01 6.531869e-02
## T_av -1.666067e-03 1.050303e-02 1.827691e-02 -4.432781e-04
## O2_sat_av -1.458978e-04 -6.885352e-04 -1.052350e-03 -4.887270e-04
## Con_av 3.310512e-04 1.118422e-04 -3.615548e-05 -1.373777e-04
## COD_av 4.519706e-03 1.850090e-03 9.873455e-04 -3.841630e-04
## NH4._av -1.908581e-02 -5.427594e-03 -2.546420e-02 -1.039064e-02
## Nt_av 2.459344e-03 -3.280792e-03 7.125438e-03 2.602391e-03
## pool_riffle1 -2.776719e-02 -2.061912e-03 7.563372e-03 2.522503e-02
## meander1 1.501418e-02 -8.648484e-03 1.197594e-03 -2.724023e-02
## netcen -3.093052e-06 -1.357062e-06 6.499642e-07 3.058410e-06
## updist -1.500177e-06 -2.615530e-07 -4.545058e-07 -1.236302e-06
## [,33] [,34] [,35] [,36]

```

```

## (Intercept) -9.926329e-02 -1.480425e-02 1.089886e-01 3.596503e-01
## avlength 4.335006e-03 1.033814e-03 -9.915825e-04 4.009826e-04
## avcondition 1.949696e-01 -4.728744e-02 4.591265e-02 -1.226052e-01
## T_av 1.536676e-03 1.917641e-02 1.128600e-02 5.420576e-04
## O2_sat_av 7.134183e-04 1.585385e-03 -7.126774e-04 -4.668302e-04
## Con_av -3.752504e-05 -6.760566e-05 -5.178517e-05 1.385763e-05
## COD_av 5.479538e-05 6.218814e-04 2.718617e-03 2.249487e-03
## NH4._av 1.808783e-02 -8.012365e-03 -4.491819e-02 -1.750323e-02
## Nt_av -5.949936e-03 5.427836e-03 1.507993e-02 1.596337e-02
## pool_riffle1 -1.132603e-02 -3.017789e-03 -5.284129e-03 1.761631e-02
## meander1 -7.888497e-03 3.928058e-03 4.956637e-03 2.447158e-02
## netcen 1.799926e-06 -1.746930e-06 5.266375e-07 -6.522442e-07
## updist 5.942911e-07 2.912431e-07 8.615626e-08 8.147668e-07
##
## [,37]
## (Intercept) 4.664490e-01
## avlength -1.423928e-03
## avcondition -1.186889e-01
## T_av 1.169964e-02
## O2_sat_av -1.672003e-03
## Con_av 7.064826e-06
## COD_av 1.484116e-03
## NH4._av -2.993290e-02
## Nt_av 6.515725e-03
## pool_riffle1 -1.512110e-02
## meander1 -2.765644e-03
## netcen -1.796119e-06
## updist 1.206938e-07
##
## $f.perms
## [,1] [,2] [,3] [,4] [,5]
## [1,] 0.5518039960 4.271212e+00 -0.1042755737 1.093839e+00 0.9931024593
## [2,] -0.3257091417 4.356519e-01 0.2011946347 6.353969e-01 -0.2251718963
## [3,] 0.4780624577 1.265040e+00 -0.0181072736 4.107714e-01 -0.3606300177
## [4,] 1.3957168263 -3.926472e-02 -0.0780575658 2.491726e-01 0.2380853615
## [5,] 0.7917482144 2.991050e+00 0.5706935117 3.995667e-01 0.2322202783
## [6,] 1.8759920032 4.563714e-01 0.4324361705 1.053164e+00 0.5740855380
## [7,] 3.7331804954 5.133223e+00 0.7896246032 1.198916e+00 1.1684308652
## [8,] 0.2514609193 8.148671e-01 0.2278232868 6.152649e-01 0.3069530007
## [9,] 3.0687445975 3.031883e-01 -0.1372622825 6.487687e-01 0.0103795807
## [10,] 0.0968910161 9.109560e-01 0.4089713251 2.816569e+00 0.5949368959
## [11,] 0.1913610987 9.493009e-02 0.3991767957 1.081239e+00 0.0664418254
## [12,] 0.7768695110 -2.350971e-01 1.1534345759 6.574066e-01 5.8849020042
## [13,] 0.1899342221 8.773763e-01 0.8600541403 9.858839e-01 0.2427500655
## [14,] 1.3107304000 8.203063e-01 0.7736103383 9.258981e-01 1.8746786383
## [15,] -0.0869336757 5.567217e-02 0.0602956582 1.140383e+00 0.2617130085
## [16,] 0.3400034115 3.373316e-01 0.4584179188 6.111854e-01 0.5050154883
## [17,] 2.5255348126 9.378789e-01 0.8217970307 -5.915803e-03 0.2116129307
## [18,] 2.1687936036 4.083029e-01 0.4234169236 3.062572e-01 2.7420452430
## [19,] 0.6901492986 2.091707e+00 0.6795004711 -1.407641e-01 0.0644178392
## [20,] 0.8239875713 1.644154e+00 1.0241577089 8.123424e-01 3.1430739884
## [21,] -0.0101671497 1.600156e+00 -0.2498570340 1.159695e-01 0.2958573100
## [22,] 0.7243634483 1.291537e+00 1.0684612330 2.580550e-01 1.6520218309
## [23,] 1.1790485199 4.712208e+00 1.7238303150 1.091767e+00 0.2396275501
## [24,] -0.3034082524 2.508606e+00 1.8658429589 9.376849e-01 3.6397103681

```

```

## [25,] 3.1875435859 8.726949e-01 1.3443180248 5.043373e-01 4.3318929112
## [26,] 1.8901928807 1.271067e+00 -0.3985495597 1.018782e+00 0.2371250747
## [27,] 0.3994039361 8.483509e-01 0.8388622018 8.421202e-01 1.3655547280
## [28,] 3.9313392220 2.117978e-01 1.5460320760 3.004087e-01 2.5881606444
## [29,] 0.8949080016 3.786472e-01 1.5797654770 1.152146e+00 0.7909820418
## [30,] 0.4593702536 3.250399e+00 2.3185254498 1.878474e-02 0.5061781826
## [31,] 1.0039698712 3.024428e-01 0.4134220746 8.802746e-02 1.2214984004
## [32,] 0.3828984834 1.914767e-01 0.3189265190 1.614001e+00 0.2670629972
## [33,] 0.9337300547 6.241187e-01 0.3695301337 1.779780e-01 2.7036921677
## [34,] -0.1115778134 -8.619340e-02 0.5452150846 -1.759793e-02 0.9489644485
## [35,] 1.7608437878 2.657013e-01 1.9153715651 3.332827e-01 0.9553379583
## [36,] -0.1523838947 1.347586e-01 0.7581538335 7.414093e-02 0.7787540682
## [37,] 0.8945469699 7.576480e-01 1.4511008533 8.475954e-01 1.1651450315
## [38,] -0.0343303451 3.743108e-01 1.2249956328 7.715859e-01 3.3049629087
## [39,] 0.1404339303 1.203017e+00 0.4909890932 6.310174e-01 0.5344035023
## [40,] 0.8087366546 1.288876e-01 0.2016227602 1.157250e+00 0.8317459283
## [41,] 1.3212574985 3.564069e-02 0.2001633115 1.308290e-01 2.1229589607
## [42,] 0.4910247337 1.907916e+00 1.3258688559 7.384260e-01 1.1671498480
## [43,] 0.1015073474 1.742141e+00 -0.1344837496 6.662838e-02 2.1080253139
## [44,] 1.7009794791 1.282409e+00 1.4386475754 1.278360e+00 2.0650214460
## [45,] 0.8838616458 6.463547e-01 0.0659915363 2.652377e-01 -0.0475828978
## [46,] 1.2426744161 2.618496e-02 1.0597392429 -7.286932e-02 2.8931356851
## [47,] 2.3402797893 4.822411e-01 0.1851591985 5.838900e-01 1.0315607415
## [48,] 0.1518644343 2.109209e+00 0.5457532873 4.202488e-01 -0.0850534773
## [49,] 2.8735004854 -1.223315e-03 0.7687060457 4.728315e-01 0.0222239897
## [50,] -0.1393045999 4.584368e-01 1.5105275509 1.835356e-01 3.0868129694
## [51,] 1.1489355584 4.393507e-01 1.2950952530 3.107913e+00 1.9904134378
## [52,] 1.5490736936 -4.012620e-01 1.0923704328 1.969510e+00 1.3055939037
## [53,] 1.3810580090 9.822603e-02 1.7028585550 1.811600e+00 -0.0307298117
## [54,] 0.4153059686 8.431370e-01 2.2815863686 1.310653e+00 1.0044339836
## [55,] -0.0246296077 3.627277e-01 1.3709975363 -8.848390e-02 0.2054842489
## [56,] 0.6133324985 3.110025e-01 3.5077245838 7.764745e-01 0.6888617737
## [57,] 0.11119599586 2.4222418e+00 0.3800817262 3.284526e-01 0.8762221335
## [58,] 0.1832738242 6.135353e-01 -0.0170147493 1.135870e+00 0.1271120359
## [59,] 5.0337195241 1.396579e+00 1.2591580261 4.442652e-01 2.8668872840
## [60,] 1.8859394313 3.549076e+00 0.7410488167 3.165670e+00 0.3317300872
## [61,] 0.5572893249 3.315224e-01 4.9057052915 5.162509e-01 1.4086853069
## [62,] 0.3419382776 7.183176e-02 1.9052762837 9.941718e-01 1.8830278018
## [63,] 0.8209702567 2.631067e+00 0.7433208373 3.063686e+00 1.1715278976
## [64,] 1.2681427205 -2.519629e-02 1.4403304841 1.342895e+00 -0.0444917804
## [65,] 0.3693106053 -9.038778e-02 0.5130039098 6.367312e-01 0.1536457450
## [66,] -0.0919558199 2.567782e+00 0.4267689942 3.519071e-01 0.2433694501
## [67,] 3.8765593896 7.700718e-01 5.5204621514 3.484898e+00 3.7804719232
## [68,] 1.2731161730 1.062478e+00 1.8871754372 9.941972e-01 1.2554880346
## [69,] 1.7370266136 6.787583e-01 0.1767416921 3.061806e+00 -0.2317247536
## [70,] 3.0800393074 -1.327146e-01 0.8906728903 6.764929e-01 1.2090871812
## [71,] 2.1475385744 7.558506e-02 -0.1895087927 1.397918e+00 1.0140549172
## [72,] 4.1032157696 -3.446786e-01 0.1980754000 8.811950e-02 0.4889803847
## [73,] 0.0242031450 2.029613e+00 1.2360181202 6.035209e-01 -0.4729263192
## [74,] 0.6072606168 2.308681e-01 2.1540620106 1.561713e+00 0.9697623484
## [75,] 0.9755031985 1.353189e+00 0.2903905602 3.082044e-01 0.6648223471
## [76,] -0.2869076162 1.593747e+00 0.0932745783 6.761603e-01 0.6601435444
## [77,] 0.4186869604 7.430317e-01 1.3596183574 2.923440e-01 0.1294650935
## [78,] 1.0172624942 1.370721e+00 -0.0125231550 2.887621e-01 0.1004289917

```

```

## [79,] 1.0567567877 3.326024e-01 0.4576487073 5.993385e-01 1.9307710286
## [80,] 0.8534043549 1.111351e+00 1.9431458167 6.003812e-01 2.3661579557
## [81,] -0.3057530018 2.855514e-01 1.5215763677 1.193544e+00 0.5465122972
## [82,] -0.4278328786 1.463288e+00 2.9821407837 1.547716e-01 0.2526131855
## [83,] 1.6754344397 7.207237e-01 2.0939609265 2.583343e+00 5.0742317582
## [84,] 1.4152634507 9.419499e-01 0.1800274592 8.619004e-01 0.5728888459
## [85,] 0.1024757916 1.608602e+00 0.5875469981 2.795200e+00 1.9131512239
## [86,] 0.6461388534 1.281392e+00 0.2063412084 1.240271e+00 0.4075907941
## [87,] 0.3355374148 2.993640e-01 0.8073415225 3.845262e-01 0.1059064702
## [88,] 0.4036925869 9.541876e-01 0.3257893652 1.452266e+00 1.2117046825
## [89,] 0.2693098371 1.796036e+00 0.9077447828 3.072384e-01 1.1402616656
## [90,] -0.1691243815 1.616317e-01 0.2340292651 2.716477e+00 1.4469863817
## [91,] 0.2154002894 9.791588e-01 0.2372803652 2.843207e-01 0.1498132650
## [92,] 0.7093612298 2.144894e+00 0.6306704643 9.176462e-02 0.8501910857
## [93,] 0.4634558650 5.359008e+00 0.2967272578 6.160188e-01 0.1353684802
## [94,] 0.5285352464 2.439262e+00 -0.1309455169 4.811664e+00 1.8568679226
## [95,] 0.5285540529 3.376778e-01 0.9493219946 7.370747e-01 2.5223008857
## [96,] 3.6132292788 1.317642e+00 0.2111999685 6.859913e-01 0.3084160681
## [97,] 0.9132145011 8.841583e-01 0.5770667988 1.465756e-01 1.0211462139
## [98,] 2.2838950759 3.353093e-01 4.7139378145 4.467392e+00 0.7438111666
## [99,] 0.3786758575 3.588118e-01 0.1907235719 6.726198e-01 0.0676917836
## [100,] 0.5853787177 3.441534e-01 1.6566224451 6.699978e-01 0.4177304433
## [101,] 1.0331967395 3.617580e-01 0.0216502985 4.230007e+00 1.0333127538
## [102,] 3.1783743238 2.432875e+00 0.6025737550 4.801694e-01 0.1367071141
## [103,] 2.5673709398 2.224257e-01 0.7555391142 2.484721e-01 3.1958642991
## [104,] 2.8955583942 3.610417e-01 0.6841441196 1.040453e+00 1.1357188859
## [105,] 0.6477284570 4.663310e-01 0.9026092705 7.128029e-01 0.5964085273
## [106,] -0.1365548505 8.194687e-01 0.6699832286 1.855288e+00 0.0283212819
## [107,] 0.4358398208 4.635190e-01 0.4860413464 -5.026243e-03 1.9368032840
## [108,] 1.0978802665 8.136801e-01 1.2822295399 3.690661e-01 0.1690571753
## [109,] 0.1733851512 2.213811e+00 2.7328570699 1.010464e+00 3.2213311168
## [110,] 1.7944753810 1.156952e+00 2.1857716460 8.994411e-01 0.7033070307
## [111,] 3.5899033130 1.516805e+00 2.6975845810 -2.057833e-01 -0.0801713769
## [112,] 0.5998529942 4.460335e+00 0.9824289704 1.462371e+00 -0.0888818487
## [113,] 0.1769007776 4.051430e-01 -0.2683304455 1.815460e+00 1.2256419858
## [114,] 0.4249755936 1.232999e-01 0.7374774591 8.544395e-01 0.0772883042
## [115,] 1.3177636994 2.738460e+00 3.1891722821 2.915747e+00 0.3916102699
## [116,] 2.2968666808 1.963853e+00 0.3451536051 -5.516081e-02 1.2004928923
## [117,] 0.9076624733 8.209471e-01 0.4129799413 4.057873e-01 0.0210919077
## [118,] 1.2221230215 -1.926610e-01 0.3322756435 1.094992e-02 0.9444245282
## [119,] 1.0939157793 7.128892e-01 0.0263488008 -9.438701e-02 0.6387588014
## [120,] 1.4489503772 6.790582e-01 1.0771196494 5.539593e-01 0.5617348355
## [121,] 0.1436233983 8.136374e-01 0.4532048077 3.910806e+00 6.1116195727
## [122,] 1.5495668595 -2.104253e-01 0.7569879852 7.737581e-01 0.6624823094
## [123,] 0.0639686822 1.202596e+00 0.0471199810 1.316089e+00 0.9641780650
## [124,] 1.11114609247 7.748736e-01 0.8567524120 2.102525e+00 -0.0943052084
## [125,] 1.9429886272 3.458206e+00 2.0039066767 2.618821e+00 1.4137367412
## [126,] 1.4629940535 6.676423e-01 0.2989081709 8.551465e-01 0.2216622490
## [127,] 2.5671104508 3.029174e-01 1.6311362472 -1.711370e-01 1.6572048328
## [128,] 0.6032397243 1.146018e+00 -0.1049483689 6.891029e-01 0.5941538968
## [129,] 1.0871449000 1.100173e+00 0.2169511893 1.307775e+00 0.4694114381
## [130,] -0.0088872748 -3.239780e-01 0.7259941640 6.936690e-02 1.8132101372
## [131,] 0.6027480486 -7.176643e-02 0.2255939642 1.413962e+00 1.1676652362
## [132,] 0.0859807672 7.550220e-01 -0.1304707588 1.180764e+00 0.2141812458

```

```

## [133,] 0.0979687216 4.673095e-01 0.8141025867 3.304250e-01 0.6496671709
## [134,] 2.9103128355 7.319874e-01 6.5058287429 1.424491e+00 0.1988822322
## [135,] 4.7535802503 9.643544e-01 5.4710652828 1.552731e+00 0.2830697927
## [136,] -0.2849418508 -2.682812e-02 2.1095069360 6.210093e-01 0.1579478176
## [137,] 0.3888702588 1.003705e+00 1.7604160382 7.515710e-02 -0.1110857297
## [138,] 1.8519594951 4.591439e-01 0.4403746327 1.021696e+00 0.8236322323
## [139,] 0.0946241400 2.616005e+00 0.5678374318 3.447595e+00 0.8278634092
## [140,] -0.2320418251 2.567810e+00 1.8703120785 1.749843e+00 1.3176405674
## [141,] 3.1865756263 1.029040e+00 0.1983553016 6.966213e-01 5.0659815993
## [142,] 0.0715414725 4.995777e-01 0.6019701493 1.463919e+00 -0.0013316395
## [143,] 0.6826751792 1.221411e+00 1.1713566270 1.333397e+00 0.4344571153
## [144,] 2.9323227582 2.269281e+00 0.4416846606 1.600324e-01 1.0905391606
## [145,] 1.5903647450 2.254379e+00 0.0326736195 4.630364e-01 0.3621896665
## [146,] 1.1703392601 1.184265e+00 0.2732268881 2.510088e-02 0.1103823441
## [147,] 0.8654231590 3.385691e-01 -0.2174394539 2.041693e-01 0.6228412174
## [148,] 1.6652054642 1.905832e+00 0.2220124145 -7.181367e-02 0.2277904941
## [149,] 0.5149208044 8.472226e-01 0.0642147300 4.125601e-01 1.0803021232
## [150,] 1.2022862567 1.894977e+00 0.4993235797 -3.506992e-01 0.0892318683
## [151,] 1.1830701512 1.611293e+00 0.4087410415 1.431290e+00 0.4849539851
## [152,] 1.4187356706 3.661470e-01 1.7295159943 2.265976e-02 0.4192099884
## [153,] -0.3699176918 1.194777e-01 0.1378644661 7.639787e-01 -0.3135658841
## [154,] 0.4912982394 4.110824e-01 1.2767229468 7.519193e-01 2.0577181142
## [155,] 0.4483100354 1.161835e-01 -0.1664401314 1.938758e+00 0.4622198825
## [156,] 3.2856997172 5.405545e-02 0.5828557731 2.445358e+00 0.8487484315
## [157,] 0.6579105083 4.135450e-01 0.1545813662 1.976372e+00 0.7802488719
## [158,] 0.2233019615 1.003838e+00 0.1908381338 4.325231e-01 0.3284554841
## [159,] 0.2205235992 3.314178e+00 1.2728802792 1.448555e+00 0.3181029005
## [160,] 0.5261912923 -1.385462e-01 2.1921696729 1.791790e+00 1.0746829447
## [161,] 4.4766423525 2.845580e+00 0.3625173861 8.146265e-01 1.0652985999
## [162,] -0.0715040907 1.491283e-02 -0.0123513504 7.372696e-01 0.5313878593
## [163,] 1.1178254996 5.725365e-01 2.9919109471 9.447838e-01 7.0371754008
## [164,] 0.1097541063 6.182288e-01 0.2015717746 -7.391400e-02 0.9261362149
## [165,] 0.4239569187 8.877548e-01 1.2227232796 6.011690e-01 -0.0747403820
## [166,] 1.3373649615 5.380262e-01 0.4548275790 1.530472e+00 0.2878649218
## [167,] 2.1651647908 8.260677e-02 0.5887965250 -1.135362e-01 2.7295263477
## [168,] 0.3381983790 1.757658e+00 0.7169710399 6.330649e-01 1.9154226359
## [169,] -0.2348797536 5.242806e-01 -0.1678567389 4.926358e-01 0.2402182329
## [170,] 3.2119111230 1.078450e+00 0.6543261147 1.676906e+00 -0.0868304192
## [171,] 1.2310409298 7.683735e-01 0.4250458219 2.532989e+00 0.7086984232
## [172,] 0.0283579131 8.505539e-02 0.3402360977 5.578928e+00 0.4693726441
## [173,] 4.5402103030 2.135491e+00 0.9038663886 3.115394e-02 0.1679948880
## [174,] 0.4917819101 4.164255e-02 0.7213945215 2.258870e-01 1.4172707873
## [175,] 0.5371351086 6.176921e-01 1.4040481893 1.242651e+00 -0.0501329560
## [176,] 0.9756351925 6.526505e+00 2.0366944427 1.055217e+00 0.3715246145
## [177,] 2.4606500960 1.429976e+00 1.7325263607 3.674351e-02 0.6432133292
## [178,] 0.2083960368 9.229586e-01 5.3007344763 1.665839e-01 0.4482470256
## [179,] 1.2674704840 2.866880e+00 0.2069497559 1.187220e+00 1.5253052571
## [180,] 0.9670535380 1.351070e+00 1.0001600057 -8.608764e-02 0.1671691280
## [181,] 0.8518345941 -9.215396e-02 1.2842178660 5.320026e-01 2.1513300924
## [182,] -0.0578395383 5.766436e-01 0.8817102965 1.518493e+00 0.0257497608
## [183,] 0.3034729436 -3.286228e-01 0.3336250747 3.120572e-01 0.0352531555
## [184,] 4.4863336426 2.524317e+00 0.2863924639 2.298232e+00 2.0209406805
## [185,] 0.7620026454 -1.085611e-01 2.6778825766 1.864607e+00 0.4139406411
## [186,] 4.2602752048 2.920318e-02 4.5619129125 9.082719e-01 6.6404118030

```

```

## [187,] 1.2343351366 4.051138e-01 0.5348663284 4.644540e-01 0.0792717721
## [188,] 0.5438483961 7.455144e-02 -0.0335087933 7.811205e-01 0.2636680911
## [189,] 0.1515461498 -2.566241e-01 0.1306990707 1.323408e+00 1.8578420914
## [190,] 1.9552377892 2.929263e-01 0.7079028043 2.307960e+00 0.7109235579
## [191,] 2.7703518389 2.508476e+00 0.9024739169 1.126980e-01 0.1316932401
## [192,] 0.5589936312 3.574268e-01 1.0303083933 4.198078e+00 0.8849672625
## [193,] 0.2446778417 1.205094e-01 0.4483560120 7.249041e-01 2.5421704884
## [194,] 5.3006535749 3.280024e+00 -0.6131633856 1.720659e+00 0.3340874253
## [195,] 0.7300547051 2.580623e+00 0.8727266300 2.232437e+00 0.2116661565
## [196,] 0.6453100772 6.601659e-01 3.1276448364 5.491370e-01 2.5388404225
## [197,] 0.3618049224 2.265711e+00 1.8584260678 -9.169399e-02 0.8738122668
## [198,] 1.3823834767 1.166212e+00 1.9019059681 1.314877e+00 1.0142759352
## [199,] 1.1741825591 6.532051e-01 0.2259529381 3.406291e-01 5.2761621740
## [200,] -0.3311128269 -3.352492e-02 2.4455867255 2.699470e+00 1.2961529301
## [201,] 2.6423712174 1.934547e-01 3.2755455307 1.744640e-01 0.3643839600
## [202,] 2.7256160611 3.774070e+00 1.1303682818 1.934901e+00 0.5459491232
## [203,] -0.3116821224 1.922976e+00 0.1914540518 5.076466e-01 0.7115454244
## [204,] 0.3111653261 7.814559e-01 0.1199501489 1.236372e+00 0.2839666975
## [205,] 1.0242015340 3.161925e-01 0.6037401732 1.334090e+00 0.9474246242
## [206,] 0.3886334327 2.834656e-01 0.4721895706 9.423689e-01 1.0400325323
## [207,] 0.4763686137 7.920465e-02 0.9007521998 2.219995e+00 3.3664872441
## [208,] -0.1126657025 1.594828e+00 0.9187334984 3.829007e-01 4.6117133477
## [209,] 0.8322937956 -3.219754e-02 0.0579127255 1.248292e+00 0.0673749789
## [210,] 1.1662934497 4.127379e-01 2.8831987404 1.272174e+00 0.4836999907
## [211,] 0.6925107589 6.348094e-01 0.4361648049 1.476683e+00 -0.1043816194
## [212,] 0.2282994367 9.953838e-01 0.4780769884 7.065652e-01 0.0707055637
## [213,] 2.4347204007 -1.741114e-01 2.7367344272 2.101502e+00 1.1154143512
## [214,] 0.2670980752 2.817365e+00 3.8536916306 -1.821327e-01 0.3492315589
## [215,] -0.1127968639 6.261630e-01 1.2329288491 1.941959e+00 0.5513046695
## [216,] 0.3049177444 8.626701e-01 0.8751066846 8.879428e-03 4.2555174449
## [217,] 0.7560885982 -1.872928e-01 0.2858445600 2.259659e+00 -0.0433331510
## [218,] 0.2695616293 6.159556e-01 0.4555490751 8.147399e-01 1.9618641073
## [219,] 2.0147502531 2.641325e+00 0.8410599220 3.261531e+00 0.3067608125
## [220,] 1.2624235535 1.725472e+00 0.4973845225 1.956645e+00 1.6449715979
## [221,] 0.0227201202 2.079119e+00 1.0022305111 -4.039240e-01 1.4131607178
## [222,] 0.4702237737 2.530150e-01 0.5871654075 2.890863e-01 0.4466402083
## [223,] 0.9389984952 8.911127e-01 0.7666966958 1.244611e+00 0.7003021016
## [224,] 0.4794765807 -8.768543e-02 0.4079518129 1.058611e+00 -0.1968426820
## [225,] 0.4162312952 3.162318e+00 -0.0358589940 4.016511e+00 3.1107996473
## [226,] 3.7292707988 2.446169e+00 0.7488007724 9.765482e-01 0.3810069765
## [227,] 0.4850673567 3.187016e+00 1.9747638382 3.582147e-01 1.5745887704
## [228,] 0.0654846748 8.957095e-01 1.0865049756 6.113757e-01 0.5388938247
## [229,] 1.0225760994 3.737765e-01 2.9778861087 7.270106e-01 0.2673966637
## [230,] 0.2570715223 -2.876541e-02 -0.1226906848 -1.855966e-02 0.6108916377
## [231,] 0.4280527772 2.744458e+00 1.5715131533 2.324738e+00 1.1200511842
## [232,] 1.1447485583 5.603782e-02 0.9876714761 8.187984e+00 1.7287943619
## [233,] 3.6248390815 1.732897e+00 3.7969465488 8.257793e-01 0.7994764129
## [234,] 0.1674779059 1.206449e+00 0.9087260823 9.187701e-01 0.6603369967
## [235,] 1.8899090178 1.064169e+00 0.1918527024 1.790549e+00 -0.1617357542
## [236,] 0.6444089276 6.046200e-01 0.0828227360 -1.198128e-01 0.1029433555
## [237,] 0.8874419302 3.044994e-01 0.1543841061 5.801842e-02 1.2597176128
## [238,] -0.0888177593 5.478754e-01 0.0770446287 6.145652e-01 1.3001926029
## [239,] 2.7897706853 1.979901e+00 2.3236067324 3.906536e-01 3.0975707065
## [240,] 1.2138482924 1.330269e+00 1.1292410776 1.586841e+00 0.5373019205

```

```

## [241,] 0.1000499911 1.185941e+00 -0.1453569766 2.199892e+00 1.5121137985
## [242,] 0.8091386346 9.781413e-02 1.5372854019 2.305324e+00 0.1457051365
## [243,] 3.1070720452 7.020218e-02 4.9403105181 4.390791e-01 2.2786113563
## [244,] -0.0225329788 9.840006e-01 0.5143551735 8.074703e-01 -0.0191617303
## [245,] -0.0501440251 4.843466e-01 0.2105446749 1.461941e+00 0.8654333870
## [246,] 0.2471721578 8.651119e-01 0.9653084025 1.979034e-01 -0.1125426410
## [247,] 2.4494488182 1.619282e+00 1.5559419857 2.455373e+00 3.6848142584
## [248,] 3.0930557842 1.890959e+00 0.9080803304 1.759402e+00 1.3783521818
## [249,] 0.4942142390 6.854629e-01 0.2008787060 -1.711937e-02 0.2266173810
## [250,] 0.3834166929 8.380746e-01 1.9773481784 7.179355e-03 0.2261060018
## [251,] -0.1442521109 3.287339e-01 0.4989938639 3.199346e-01 -0.1034184685
## [252,] 0.1678870687 1.395707e+00 0.6562823666 1.007668e+00 1.1344239568
## [253,] 0.3010610780 1.311347e+00 0.4998524377 8.262216e-01 0.8906546987
## [254,] 1.2123604401 2.706368e-01 -0.0157605428 2.166046e+00 1.0978560712
## [255,] 2.4666642807 1.801610e-01 0.6611787294 2.537539e+00 2.2588794360
## [256,] 0.0173719509 5.247042e-01 0.9624759970 -6.615691e-03 0.7661942328
## [257,] 1.1061715651 1.884710e+00 -0.2044697544 9.655820e-01 0.4997067487
## [258,] 0.5770257018 2.403448e-01 1.3505213105 6.883619e-01 0.2392147252
## [259,] 1.6345864928 6.857408e-01 1.7028531428 1.171467e+00 1.0696643117
## [260,] 0.1983313841 -4.440708e-01 0.3679808554 -7.925630e-02 -0.1435569380
## [261,] 0.5738988800 3.506819e-01 2.5156846504 4.177698e-01 0.0335614073
## [262,] 0.3294376334 1.357009e+00 3.5025600709 1.551336e+00 0.1822778814
## [263,] 1.4172837112 -3.451907e-02 0.6357082706 5.554075e-01 1.9672373903
## [264,] 1.3345655153 9.048226e-01 1.9525699252 1.446364e+00 0.4218542106
## [265,] 1.0728919949 1.347385e+00 0.9214780990 1.116209e+00 0.2934653239
## [266,] 1.59115959358 8.782733e-01 1.1440578224 3.997690e-01 1.5645421158
## [267,] 0.0814662442 1.873164e+00 7.2012886244 4.697860e-01 0.6905014082
## [268,] 1.1820833722 4.809080e-01 3.8307724623 7.094632e-01 0.1461335329
## [269,] 0.4111457757 1.393112e+00 4.4359143765 1.309565e+00 2.2201837823
## [270,] 0.1933436764 1.229249e+00 1.5746714086 3.192641e-01 0.5169643517
## [271,] 0.7337305689 1.525347e+00 0.3227342617 9.325585e-03 1.9484343594
## [272,] 0.5375250936 4.593059e-01 1.9087361389 1.619908e+00 1.0011398528
## [273,] 0.9533422617 1.763712e-01 1.9662915102 -1.217137e-01 0.6921874150
## [274,] 2.0586811143 4.738491e+00 1.3830370038 -9.420557e-02 0.4969612332
## [275,] 2.2856616177 2.133918e+00 0.6163729796 2.387805e-01 0.6784492107
## [276,] 0.1164606656 6.519662e-01 0.8196779321 1.067400e-01 0.3146461537
## [277,] 1.2044224976 -1.423656e-02 2.1000754959 2.700692e+00 0.5489845131
## [278,] 1.4097174899 7.777800e-01 1.9957613942 1.502835e-01 2.6711471554
## [279,] 1.7749803359 2.714008e-01 1.1931026272 1.168552e+00 0.5155459490
## [280,] 0.5233530174 5.319394e-01 3.5933591000 2.093860e+00 4.6110857183
## [281,] 0.7866642484 6.786310e-01 2.8995008630 1.320099e+00 3.8038314485
## [282,] 0.0331934607 5.116750e-02 1.4550798527 2.365908e+00 -0.1402081401
## [283,] 0.3147855075 2.532563e-01 0.3815426848 6.778834e-01 0.0519097687
## [284,] 0.7846822776 1.564096e-01 2.0106734415 2.655572e+00 0.7634411667
## [285,] 0.1879491784 1.197834e+00 1.3182194306 2.569074e-01 1.7149964221
## [286,] -0.4435679258 9.011109e-01 -0.0094579664 1.039277e+00 1.6416309408
## [287,] 1.4909162282 5.061342e-01 1.3091654399 1.148735e+00 0.1086839844
## [288,] 2.9329676998 2.164911e-01 1.3959342075 3.001986e-01 0.1791005594
## [289,] 0.7034592792 1.188889e+00 1.3843973734 1.195474e-01 0.1915945544
## [290,] 0.0491601086 1.002452e+00 3.4486453479 2.608665e-01 1.8546675767
## [291,] -0.1256065728 -1.986899e-01 0.5931071743 -6.640659e-02 1.0200178707
## [292,] 0.5063419965 -5.739930e-02 4.3504961994 8.134260e-01 0.7580867930
## [293,] 2.4497635473 1.401627e+00 -0.0049525525 1.730896e-01 0.8024736369
## [294,] 1.9889977323 9.894933e-01 0.7478018663 1.185343e+00 1.4276216450

```

```

## [295,] 0.0064512297 5.716806e-01 0.0637190064 4.737535e-01 0.5430848456
## [296,] 1.2953305365 6.512266e-01 1.0979058107 7.758095e-01 0.8274614299
## [297,] 1.2345642229 1.192682e+00 0.7848365705 2.300717e-05 2.0158860532
## [298,] 0.0647274602 2.202470e+00 -0.3145593221 7.283614e-01 0.2460907322
## [299,] 4.3409000895 2.058771e+00 0.9034581689 5.957904e-01 0.1293721217
## [300,] 3.4120787354 3.886818e-01 2.6319564186 2.067612e+00 1.6639575917
## [301,] 1.7785111638 1.898510e+00 0.7254549399 6.371562e-01 0.7164053309
## [302,] -0.0461066150 1.680267e+00 0.5487220673 7.224202e-01 -0.0401285902
## [303,] 0.2342355035 1.054433e+00 0.5763896773 3.598053e-01 0.4372720664
## [304,] 0.2452394386 2.281062e+00 0.6330770767 -2.432133e-02 0.7390977502
## [305,] -0.0353224589 9.678065e-01 0.0423160863 8.702106e-02 0.9605930972
## [306,] 1.5437755313 1.142895e+00 0.1806283222 2.411950e-01 3.0010406739
## [307,] 0.7819002280 8.562045e-01 0.8567396807 -2.080572e-01 0.9619833681
## [308,] -0.0351495650 1.151515e+00 0.5191770271 4.644588e-01 1.7967612648
## [309,] 1.5159460737 8.130336e-01 0.6559799094 -1.398231e-01 0.9010987261
## [310,] 0.1120108374 1.358242e+00 1.1196099116 8.604301e-01 2.0737007911
## [311,] 1.4433105463 -1.549755e-01 0.3338447542 1.206113e+00 1.0834214043
## [312,] 0.2519235423 6.792129e-01 1.3943609263 1.920798e+00 0.0789447031
## [313,] 9.0262922004 4.573828e+00 0.3790683227 1.124745e-01 -0.0574417400
## [314,] 0.0910864993 1.528893e+00 0.1006290706 1.107295e+00 0.0356726248
## [315,] 0.5072455053 1.131859e+00 4.4082903189 9.449021e-03 0.0438049321
## [316,] 4.1614888352 1.346767e+00 2.6302944930 3.657548e-01 0.3079674025
## [317,] 0.0747222752 3.079690e+00 0.5384666826 1.691305e+00 0.7206139459
## [318,] 2.1734866199 2.928267e+00 0.0606299245 8.597584e-01 1.6299049584
## [319,] 2.8028775703 -1.459245e-01 0.1321898750 7.475767e-01 7.7105403091
## [320,] 1.2387375463 1.207414e+00 0.1590663983 6.940547e-01 0.9457579656
## [321,] 0.6118618400 1.243608e-01 0.2088765138 1.575347e+00 0.4020744380
## [322,] 2.7679202201 4.378766e+00 0.3120469856 5.325526e+00 0.5332438157
## [323,] 1.2420795517 6.398900e+00 0.5463645054 6.853180e-01 1.3788859461
## [324,] 1.8133981063 1.149877e+00 1.9035796538 2.468173e+00 0.7910966105
## [325,] 1.1881112844 2.717755e+00 0.3743656601 4.059819e-01 -0.1613149736
## [326,] 1.0260888002 5.923571e-01 0.2519173592 1.002521e+00 0.0647612254
## [327,] 0.3013369703 4.503449e-01 3.1212129360 5.120454e+00 0.0120539745
## [328,] 0.5354664759 1.007696e+00 0.4252075963 7.599837e-01 0.4653970349
## [329,] 0.6739964753 4.654518e-02 3.3956195093 8.631919e-01 0.3297102015
## [330,] 0.5145210420 2.787536e-01 0.0173064876 8.970062e-01 0.6472264913
## [331,] 1.0641073349 8.836258e-01 -0.2021048798 1.426789e-01 1.0822352002
## [332,] 0.3968248330 3.774634e-01 0.3638509828 1.232051e-01 4.1643341728
## [333,] -0.0938647462 8.235966e-01 0.0506006636 1.760751e+00 0.0140433840
## [334,] 0.7854642115 2.169902e-01 0.2685941993 1.205336e-01 -0.0873387008
## [335,] 0.3339172384 1.727328e-02 0.4598390523 1.269471e+00 -0.1450653507
## [336,] -0.1588214687 2.743475e-01 0.4674404011 4.780309e-01 0.4504030815
## [337,] 1.5539657009 1.248353e+00 -0.0762553476 1.110570e+00 0.0119691534
## [338,] 0.4741827849 1.366758e+00 3.1256077868 3.192240e-02 0.8974645472
## [339,] 0.7530793925 2.632091e+00 0.2471189330 3.112921e-01 0.5646385802
## [340,] 1.0670575813 1.610676e+00 1.3685171360 1.514435e+00 0.4339588482
## [341,] 0.5034103312 3.078920e-02 0.0720395267 9.096837e-01 0.3679833663
## [342,] 1.9496881049 -9.211001e-02 0.7068409476 7.644665e-01 0.0769984226
## [343,] 2.1339875047 1.793392e+00 4.7211422139 7.691648e-01 0.2011276776
## [344,] 1.4700231815 -3.703074e-01 2.6035291452 2.095618e+00 0.3206932911
## [345,] 0.0850862277 -8.211035e-02 2.0337410304 -2.554637e-02 0.1617191465
## [346,] -0.1147839443 -9.590950e-02 0.1929380672 4.880396e-01 0.8944464613
## [347,] 0.2850333159 1.287374e+00 2.2666376770 -1.132942e-01 2.1073924093
## [348,] 0.4335653654 9.450161e-01 8.1098995351 1.963198e+00 -0.4080954224

```

```

## [349,] 1.9472843652 3.069972e-01 0.9826893765 2.629774e-01 0.9700974703
## [350,] 0.2149696237 1.492332e+00 -0.0451764500 2.046831e-02 1.9568800122
## [351,] 2.3293109661 2.190276e-01 0.4570672134 2.121511e+00 0.9316703239
## [352,] 1.7092765704 1.892581e+00 0.0287857349 5.526415e-01 -0.0920134863
## [353,] 1.3745734537 5.527399e-01 2.2827866723 2.082349e-01 1.9318669812
## [354,] -0.1177934055 1.314514e+00 0.2917799789 5.125467e-02 1.9521376159
## [355,] 0.4718055705 1.334159e+00 1.5757423569 3.323323e-01 0.4374348091
## [356,] -0.1720558696 8.138919e-01 1.4614581076 3.673997e-01 -0.4688756500
## [357,] -0.1153847038 -3.796194e-01 1.2740798877 2.621895e+00 0.5493079006
## [358,] 2.5826716679 1.424201e+00 0.7475098199 1.482066e-01 0.4219880447
## [359,] 0.4643818128 7.905359e-01 -0.1851503969 2.096432e-01 0.0477249737
## [360,] -0.2896204063 4.813497e-01 0.1003629260 1.864408e+00 2.2857684505
## [361,] 0.2356037507 5.748954e-01 -0.2338445651 1.311354e+00 3.5954425086
## [362,] 1.6150746551 7.732861e-01 2.2044556445 3.416974e-01 0.5640144397
## [363,] 0.3978138813 2.916658e+00 0.9555826853 2.785410e-01 0.9657398039
## [364,] -0.0300610698 1.742678e-01 0.0363329075 8.738098e-01 0.2689261885
## [365,] 1.8343127496 3.520124e-01 0.8575441860 2.248158e+00 0.7075899346
## [366,] 0.5297853433 3.032417e+00 0.9206211367 7.985033e-01 -0.2618848955
## [367,] 0.2242478114 1.202700e+00 -0.0570936374 2.331519e-01 0.8492899337
## [368,] 4.0031973147 6.385523e-01 0.5028577091 2.798990e-01 0.9284256686
## [369,] 0.9576879376 6.935878e-01 1.2845740174 3.631748e-01 0.2553447406
## [370,] -0.1000771979 3.066908e+00 1.0041698078 1.951612e+00 6.7822000340
## [371,] 1.7763940511 4.108197e+00 2.3924975102 3.741230e+00 0.1696445827
## [372,] 0.9776929976 1.228253e+00 0.5807464733 7.283605e-01 0.1495654953
## [373,] 0.1763766740 1.004512e+00 1.5263109418 1.275371e-01 1.2210471972
## [374,] 1.0579015915 1.163048e+00 -0.0278250194 1.011019e+00 -0.0220618389
## [375,] 1.8943303818 1.343262e+00 0.4551658048 7.914734e-01 1.4912126594
## [376,] 0.2339290499 8.211247e-01 -0.0179629626 3.977245e-01 0.8001652100
## [377,] 1.4036505379 1.111004e+00 1.3179294387 5.172542e-01 0.9420874992
## [378,] -0.0010119542 3.889767e-01 1.2283709490 2.127467e+00 -0.1837608104
## [379,] 0.1452208935 2.030041e+00 1.2734903733 1.464805e-01 2.3103679873
## [380,] 0.9074748855 9.961266e-01 0.2288644015 3.361193e-01 1.9548682070
## [381,] 0.6088130438 -1.963864e-01 0.1040838615 1.186151e+00 0.5952939300
## [382,] 0.3256373625 2.043092e+00 1.5407091918 6.210754e-02 0.8786886390
## [383,] 1.2120288890 3.697045e+00 2.9536016766 2.818532e+00 2.0579767504
## [384,] 0.6937135744 3.725001e-01 0.9974571221 2.845603e-01 1.0410422656
## [385,] 1.9348948021 1.760994e+00 2.3846203496 1.823708e-01 0.2869596696
## [386,] 0.7477377562 1.646930e+00 -0.1314529004 5.789476e-01 0.8205744650
## [387,] 0.2979030290 1.239587e+00 0.6227973162 5.601617e-01 1.0425306180
## [388,] 0.3702107065 2.387750e+00 0.8382777925 1.391432e+00 1.3401786495
## [389,] 0.3983949551 1.655449e-01 0.1362300492 7.070611e-02 -0.0292972256
## [390,] 0.3275334252 1.082934e-01 0.0197039379 3.380101e+00 0.2744857380
## [391,] 0.8226549152 4.895773e-01 1.1085561563 1.604587e+00 0.0404377115
## [392,] 0.4706711738 -1.302886e-01 0.5071965029 1.698589e+00 0.1926898360
## [393,] 2.3012619956 1.236700e+00 0.3777620745 1.561155e+00 0.7424238580
## [394,] 0.3230727064 5.793086e-01 0.3022343161 8.371562e-01 0.9356387018
## [395,] 0.2315564103 3.188105e-01 0.7745864685 4.092709e-01 3.2352541352
## [396,] 0.3909616686 3.513601e-01 0.6341842175 7.378317e-01 0.7502270621
## [397,] 0.3974024849 6.087818e-01 0.5448712503 5.098714e-01 1.9879899816
## [398,] 0.3532640402 2.221542e-01 0.6299361316 4.881669e+00 0.0196113199
## [399,] 0.7986622399 6.358796e-01 1.9287636472 1.949937e+00 0.1410149124
## [400,] 1.7505634274 1.119446e-01 0.4968053442 3.768644e+00 1.1794698102
## [401,] 0.9135094447 8.326013e-01 1.7860282681 6.437628e-01 0.7244323725
## [402,] 1.1601129037 3.272190e-01 0.3182102849 3.282419e-01 1.9456187243

```

```

## [403,] 1.2784260989 1.883791e+00 1.1277829709 -2.479200e-01 1.0065782802
## [404,] 0.2560138791 -2.644110e-02 0.0873534983 2.726884e-01 -0.0079320404
## [405,] -0.0601780103 6.659098e-01 1.3396445883 2.816770e-01 0.0852100485
## [406,] 0.8825443469 3.665920e-01 0.2786092661 2.904475e-01 2.3711497768
## [407,] 1.0694941676 1.327324e+00 1.1621085992 1.083140e+00 1.2270995930
## [408,] 0.1630934466 6.018857e-01 2.3654689784 1.364497e+00 0.9965494239
## [409,] 0.1944659269 2.102022e+00 0.6899636542 6.108086e-01 1.3721254590
## [410,] 0.4287467050 -1.387699e-01 1.6785411447 -2.729305e-01 2.7547110051
## [411,] 0.5799568969 1.077066e+00 0.1408383561 1.077735e+00 0.1646514614
## [412,] 1.8625898113 1.303304e+00 1.7360956780 4.127844e-01 -0.1847481057
## [413,] 0.0754297821 1.693143e+00 4.2791343392 5.655245e-01 0.4652032970
## [414,] 0.3690446248 1.286874e+00 0.6897514271 1.438017e+00 1.6237642330
## [415,] 0.3054119919 4.248724e-01 0.2312589268 1.379227e-01 1.1387857356
## [416,] 0.7959246667 4.413530e+00 0.7410679988 9.123476e-01 1.1521406094
## [417,] 0.8457904832 -2.424179e-01 1.0520355622 6.809679e-01 0.4714738992
## [418,] 0.9194558452 -3.797972e-02 0.9255694312 1.970294e+00 0.4130791256
## [419,] -0.1804061571 7.708697e-01 1.5373486285 8.285931e-01 0.1252713128
## [420,] 3.5047050777 2.877209e+00 0.8761087984 1.003576e+00 1.3228241552
## [421,] 0.4853048227 3.508478e+00 1.5382944676 1.292749e+00 0.7235266514
## [422,] 2.0876606427 1.830919e+00 -0.1343732808 2.522467e+00 1.8590969782
## [423,] 1.1687611969 7.922709e-01 1.7017282215 7.717801e-02 1.5817059723
## [424,] 0.5687389580 -1.766155e-01 0.0834545596 2.122601e-01 0.5025015407
## [425,] -0.2024816844 8.787558e-02 0.0332487140 4.359195e-01 0.0012101097
## [426,] 0.1547711689 2.577051e+00 2.3482439043 2.211838e+00 1.4118893850
## [427,] -0.0881573351 3.528002e-01 0.5278433380 5.667201e-01 1.1057620145
## [428,] 0.4302568920 4.934399e-01 3.6256562039 4.931621e-01 -0.1077512712
## [429,] 0.1842309829 1.647193e+00 3.4301786917 2.362469e+00 0.3932442770
## [430,] 0.3825137846 2.506138e-01 1.4586605711 7.624365e-02 0.3739415601
## [431,] 5.3377770706 3.391977e-01 1.1079329263 6.543688e-02 4.7761820038
## [432,] 2.4847040088 1.348590e+00 3.4241167898 7.087108e-01 1.3076755964
## [433,] -0.0938028948 -1.426911e-01 -0.2367165729 9.325228e-01 2.0602405356
## [434,] 3.3067838790 4.917724e-01 0.0066231190 7.802920e-01 0.0714908332
## [435,] 1.8205556664 1.555819e-01 -0.1606777759 5.034715e-01 0.7875843084
## [436,] 0.1642679041 7.335009e-01 -0.1016246341 3.470231e-01 0.5759544862
## [437,] -0.0170363864 2.989027e-01 -0.0069529940 1.233890e-02 0.0569780757
## [438,] -0.0193189716 7.992391e-01 0.3396364956 1.720394e-01 -0.1941030956
## [439,] -0.0368691130 -2.798675e-02 -0.1212846909 3.256393e+00 -0.0205937538
## [440,] 0.1456236186 8.713666e-02 0.1139665907 8.679856e-02 0.5419700670
## [441,] 0.8722801975 1.318928e+00 1.7417599491 1.437301e+00 0.8579557748
## [442,] 1.2725110060 1.008749e+00 0.9227463284 9.571985e-02 1.3337726915
## [443,] 1.1602972381 1.227618e+00 0.3625746293 3.218299e-01 -0.0898059544
## [444,] 0.9848212689 -1.199805e-01 0.0243717704 -1.985655e-01 0.2608331732
## [445,] 2.2702867463 6.262530e-01 0.1278101902 3.747744e-01 0.9603047348
## [446,] 0.5695247951 5.668518e-01 1.0011828184 2.466217e-01 0.8102287218
## [447,] 1.0137294349 8.345593e-01 2.1508490857 1.835252e+00 1.6252517726
## [448,] 0.5276709821 2.801607e-01 0.4583345343 1.526107e+00 1.5070802304
## [449,] 0.6092297369 -1.065796e-01 1.2153696744 1.589543e+00 0.5890997843
## [450,] 0.6364519298 6.268466e-01 0.9233459587 1.865107e-01 4.2027610457
## [451,] 1.3064005290 8.464624e-01 3.3538005696 6.823725e-01 1.4013263784
## [452,] 0.4353470149 -1.754726e-01 -0.0553061282 2.637787e-01 1.0411281937
## [453,] 0.3404048767 9.997564e-01 2.0680813848 3.678714e-01 0.7901011043
## [454,] 1.3200684734 1.402162e+00 0.3909309928 1.388647e-01 3.7242857658
## [455,] 6.8019411204 3.645276e-01 1.1382912727 3.977764e+00 4.9543999983
## [456,] 5.0806502709 1.128624e-01 0.8778349143 3.023205e-01 2.2674126192

```

```

## [457,] 2.2926613662 2.753245e-01 2.1667258096 1.087988e+00 -0.1145076836
## [458,] 2.1382718072 1.758194e+00 1.0269733879 1.595057e+00 1.2352691254
## [459,] 2.4244581596 2.339870e+00 -0.1011693752 1.398922e+00 0.2301761546
## [460,] 4.2528905138 2.153026e-01 0.3383586405 -2.034453e-01 2.0724895617
## [461,] 0.5552131438 8.073156e-01 0.9009931397 1.936712e-01 0.9225727195
## [462,] 0.1970470203 9.882064e-01 -0.1008798425 4.042446e-01 0.8258226925
## [463,] 0.5354389187 1.749896e+00 0.8224478166 1.968835e+00 0.7523669612
## [464,] 2.0734802647 4.834434e-01 5.1540505161 1.702228e-01 1.8438743300
## [465,] 1.3271400842 4.051935e-01 0.9045175006 7.431441e-01 3.4280239232
## [466,] -0.1648110176 1.480070e+00 0.1709877440 1.920920e+00 0.7402491687
## [467,] 1.6083188129 5.633021e-02 2.0516213658 -2.794372e-01 0.8554868180
## [468,] 0.3715909935 5.689055e-01 1.0560131835 4.459064e-01 0.5576779514
## [469,] -0.1034497481 6.717563e-01 1.3823146873 6.719895e-01 1.7908008438
## [470,] 0.4722637868 4.555295e-01 1.6129270276 1.704117e+00 0.7465252527
## [471,] 0.9134533708 6.181244e-01 0.0420282641 2.145623e+00 0.0576378941
## [472,] 1.5295481802 3.408503e-01 0.6610675670 2.408787e-01 -0.1036367924
## [473,] 0.9102117632 2.270123e-01 2.2803874953 9.225559e-01 0.0059516711
## [474,] 0.8669221138 1.625170e-02 0.6805548662 1.497427e+00 -0.0878247160
## [475,] 1.0014314400 1.972974e+00 0.9967104925 7.963653e-01 0.2779223072
## [476,] 0.6210617787 4.660843e-01 0.1355802464 1.603738e+00 0.3788430967
## [477,] 1.1743645716 -3.056876e-02 0.0169771415 4.803648e+00 0.9981369906
## [478,] 0.9773195248 -1.663343e-01 2.4680987538 1.428838e-01 0.5787667693
## [479,] 0.7574331025 5.729613e-01 -0.0006904159 3.470757e-01 0.2889879393
## [480,] 0.8079697467 2.501553e+00 2.0248404406 4.909145e-01 0.8415523617
## [481,] 0.5560649139 3.753846e-01 -0.4813992164 2.154854e+00 2.2702212206
## [482,] 0.4450008644 1.211872e-01 0.7371881243 9.673968e-01 2.2251855174
## [483,] 2.9843406317 -1.517530e-01 0.4275905092 3.265210e-01 0.6338555159
## [484,] 0.4865701796 3.184786e-01 0.7520022079 3.479655e-01 1.0683660000
## [485,] 0.1683309339 1.487617e+00 1.4983018509 1.734214e+00 -0.0248974935
## [486,] 0.2775617200 -1.741059e-01 1.7050596938 1.904921e-01 2.0889286213
## [487,] 0.1107491636 1.191539e+00 4.2204794209 4.517501e+00 1.3253437926
## [488,] 0.4869958960 1.469617e+00 0.6779824698 7.242934e-01 0.7216824881
## [489,] 1.4369640952 2.798233e-01 1.4410138130 -1.842212e-01 0.4575209120
## [490,] 1.0139511312 7.038179e-01 0.2521854357 7.746404e-01 -0.0489027224
## [491,] 1.9447395028 4.214880e-01 2.1411452515 6.163964e-01 0.2859130726
## [492,] 4.2365730278 -6.160931e-02 0.2750321706 4.523244e-01 1.3832707250
## [493,] -0.0667795117 3.541282e-01 0.3364769059 3.909076e-01 0.4540981458
## [494,] 1.4434177753 2.091288e-02 0.6143045480 3.586224e-01 0.0365068014
## [495,] 1.4859832937 -1.172427e-01 0.2530970400 -4.012369e-02 0.7450321712
## [496,] 1.1682387395 7.674686e-01 0.0096718799 7.435738e-01 0.2901817822
## [497,] 1.4744150519 1.031910e+00 2.3340271438 1.477700e+00 1.7066266676
## [498,] 1.5415630772 8.295501e-01 4.7239114236 9.568202e-01 0.9618843801
## [499,] 1.3659940423 7.595464e-01 0.9654447543 -3.315300e-02 0.7497626261
## [500,] 1.8870820787 5.282865e-01 -0.1332061026 1.033440e-01 1.2620393318
## [501,] 0.5258341771 2.373610e-01 2.0338706858 1.719509e+00 0.9289605298
## [502,] 0.2160755553 6.308577e-01 1.1113181760 1.332546e-01 0.6351764757
## [503,] 1.1934687699 2.107138e-02 0.0057881100 1.951287e-01 0.5285101509
## [504,] 0.0714367973 1.435597e+00 -0.0346767712 -7.975024e-02 1.6667595279
## [505,] 0.4510128753 1.261300e+00 3.0520068326 3.713606e-02 0.3045985102
## [506,] 0.5285010700 1.178737e+00 0.4981910356 4.523106e+00 0.8012365280
## [507,] 2.4622347572 -5.274164e-02 0.4254801970 1.275611e+00 0.3900403355
## [508,] 0.6243507366 2.335941e-01 0.2333417786 2.025652e+00 1.7114463328
## [509,] 0.6476306034 1.251082e+00 0.3494527321 1.061891e+00 0.7080794202
## [510,] 0.4935477247 2.151413e-01 0.0131895458 1.305401e+00 0.0225004314

```

```

## [511,] 0.2479813679 1.189084e+00 1.3747201260 4.200312e-01 0.1398367351
## [512,] 0.6429001662 4.787178e+00 1.0926583157 8.488151e-01 0.3067160637
## [513,] 2.1074850492 1.459867e+00 0.7734895341 2.143411e+00 0.1197963570
## [514,] 0.0285143284 3.232619e-01 1.3596582209 -2.707790e-01 0.3905201585
## [515,] -0.0241100908 -1.199056e-01 0.9811083298 2.993017e+00 2.0388942676
## [516,] 1.7592328973 7.868629e-01 0.2899733635 6.617020e-01 0.9491167548
## [517,] -0.1408148923 1.292844e+00 0.2052166265 5.070861e+00 0.4314759439
## [518,] 1.7964442752 1.927783e-01 0.4469584586 1.641651e-01 2.1511236746
## [519,] 1.3303943131 1.764876e+00 0.0019419268 6.230571e-02 0.0006070176
## [520,] 0.9609609413 1.502675e+00 1.3509790506 3.330534e+00 0.6373559138
## [521,] 1.3674093750 8.047850e-02 1.0414106958 7.044415e-02 0.9714859871
## [522,] -0.1919903969 3.861498e-01 0.5295343414 1.200906e-02 1.6624089841
## [523,] 1.4738902378 1.044957e+00 -0.2406508538 3.219598e+00 0.2257441659
## [524,] 0.1025320355 4.010986e-01 2.5345282811 3.166745e+00 0.2200729720
## [525,] 2.1619684860 5.605528e-01 4.3847530152 1.375605e+00 3.1129335273
## [526,] 0.5871301074 5.685864e-01 0.5329441465 -1.588936e-01 1.8683332484
## [527,] 1.3559674651 2.261664e-02 0.4800880804 3.904878e+00 0.5474124092
## [528,] 0.1795212337 6.336349e-01 0.1929951151 1.890427e-01 2.5476079203
## [529,] 0.4852465042 -3.602586e-01 0.3269140136 2.202650e+00 -0.1274019317
## [530,] 0.2896479008 7.624036e-01 1.1189923116 1.314918e+00 1.0682426022
## [531,] 2.9723276598 1.358592e+00 0.5749059688 2.924158e-01 0.6038124501
## [532,] 0.4413674673 6.728311e-01 2.1057555521 -1.925391e-02 0.2364164375
## [533,] -0.1327751704 1.684295e+00 0.2048403826 6.605591e-01 4.3123096459
## [534,] 0.0186863345 5.488720e-01 2.0928684630 7.101322e-01 1.0016509934
## [535,] 2.4439811786 2.841628e-01 0.1275168812 5.058942e-01 2.7674763475
## [536,] 0.6923065263 1.395397e+00 2.0716052888 4.351309e-01 1.4537783749
## [537,] 1.0335296652 5.830001e-01 1.6012219182 1.618947e+00 0.2486822763
## [538,] 0.5431783829 5.068875e+00 0.5784735065 4.539133e-01 1.9889431361
## [539,] 1.9153598694 1.286976e+00 0.9941545666 8.606308e-01 -0.2137962243
## [540,] 1.3216397555 3.654814e-01 0.6448415087 3.286135e+00 0.4034100559
## [541,] 1.4442568789 1.874665e+00 0.7033129193 5.867860e-01 0.3951603262
## [542,] 2.3287236336 1.215773e-01 0.1201360834 9.270621e-02 0.1143449235
## [543,] 0.7073862538 2.431157e+00 1.7238658097 1.763041e+00 -0.2455759499
## [544,] 0.9721331885 1.313569e+00 0.2300862414 -3.333468e-01 0.0340724526
## [545,] 1.0387102178 2.347919e+00 0.3833313264 2.727775e-01 -0.1890239865
## [546,] 0.9314501318 -1.142779e-01 -0.1320783751 1.072640e+00 3.4184325851
## [547,] 1.2515336254 5.320316e-01 0.1691122779 1.258651e+00 0.4349101610
## [548,] 0.4113448360 1.112178e+00 0.2395215288 3.129753e-01 0.3381798585
## [549,] 1.3577361339 1.281877e+00 0.3808277486 1.412999e+00 -0.0908387723
## [550,] 0.9825940307 7.042115e-01 0.8474483832 1.027281e-01 0.5810185899
## [551,] 0.4219004637 2.010342e+00 0.1954592674 3.487504e-01 1.9750109879
## [552,] 0.4590127529 3.660788e-01 0.8244282883 -4.394911e-03 3.5033104990
## [553,] 4.7671977653 4.770041e-01 1.7277848498 6.603077e-02 0.7716707157
## [554,] 0.4582572807 1.058185e+00 -0.1120041973 4.839162e-03 0.9379653879
## [555,] -0.0729691074 5.860932e-01 -0.0751830876 4.614613e-01 1.4697368278
## [556,] 0.9369402456 2.071147e-02 2.4313964552 4.912260e+00 0.4929493570
## [557,] 2.6413821767 8.798265e-01 0.8307514749 3.081928e-01 0.4983664681
## [558,] 3.5997215865 2.176317e+00 2.5475893447 8.364461e-01 0.5444854323
## [559,] 2.0506899844 6.345025e-01 1.5175967676 7.150203e-02 1.7739874655
## [560,] 1.6478122897 8.036412e-01 -0.1536320684 2.244097e+00 0.3101111688
## [561,] 2.7346122315 1.947759e+00 0.5036882922 1.156755e+00 0.7735747491
## [562,] 1.4643281881 1.127302e+00 1.0075649454 7.576303e-01 0.0986788287
## [563,] 0.3186383215 1.301313e+00 0.0863037079 2.842969e+00 0.7741226276
## [564,] 3.9050596754 -2.698969e-03 1.8182671459 9.880794e-01 0.4734802371

```

```

## [565,] 0.6195282914 3.289262e+00 9.8034273324 4.837704e-01 0.4693616518
## [566,] 0.5242482189 5.741924e-01 0.0526371572 1.084758e+00 0.6986656739
## [567,] -0.0514921766 3.087240e+00 3.1271712725 3.938780e-01 4.0202396085
## [568,] 1.4897827360 5.739827e-01 1.2675608353 1.336893e-01 -0.0200864117
## [569,] 0.4299592609 1.379497e-01 1.7039736020 2.870745e+00 0.9128447355
## [570,] 1.2306859973 2.556437e+00 0.3945272382 2.479228e-01 1.3470246412
## [571,] 0.8134690151 2.540397e+00 1.2783111480 1.278232e-01 2.3858330316
## [572,] 1.2864642476 9.765369e-01 0.0402092691 2.423801e+00 2.2240519475
## [573,] 0.6465681580 -9.791094e-02 0.7488794783 2.237899e+00 0.5859652235
## [574,] 1.0847261985 1.993493e+00 1.3604049179 8.029196e-02 -0.1576819286
## [575,] -0.0059017714 2.384630e+00 1.2465545929 5.444908e+00 -0.1784867921
## [576,] 0.0088265887 4.226343e-01 4.8531582151 2.247558e+00 0.6870518977
## [577,] 0.2167980161 2.547015e+00 0.7193887515 1.275279e+00 0.0487539890
## [578,] 0.2255653992 9.017356e-01 3.6708192704 1.676109e+00 -0.2924367078
## [579,] 0.9285046921 7.208443e-01 2.2305004692 1.957635e+00 1.3109627989
## [580,] 0.3743649104 1.139634e+00 0.6598035356 8.118037e-01 0.6144504667
## [581,] 0.3030371621 2.312950e+00 0.3175108495 8.250717e-03 1.0672311418
## [582,] -0.2242441456 -1.094301e-01 1.1197552284 3.278724e+00 0.8821836363
## [583,] 0.1113819059 6.720944e-01 1.7356420135 6.335499e-01 2.6561892931
## [584,] 0.9986242033 3.756261e+00 1.1560879318 3.945954e-01 1.3118651762
## [585,] 1.0399785128 -4.878496e-02 2.6351748856 3.963728e+00 0.0966536382
## [586,] 1.2212556522 3.856912e+00 -0.0493544778 3.693365e+00 0.6779151875
## [587,] 1.5842839887 1.418424e+00 1.7424494900 6.495318e-01 1.2359844768
## [588,] 0.9699349434 1.246969e+00 1.5753302556 8.391085e-01 -0.0223631470
## [589,] 2.9732489719 1.570812e+00 0.3962710005 1.041655e+00 0.4049458093
## [590,] 4.5203715105 7.227271e-01 0.2799001415 1.891495e-01 1.2631095768
## [591,] -0.0071339041 1.992892e+00 0.9609420452 4.872855e-01 0.4851652201
## [592,] 0.1885711135 1.471406e+00 3.1181142995 3.610918e-01 0.0753253557
## [593,] 5.0119131360 4.506079e-02 0.5445699637 5.335739e-01 1.4702105933
## [594,] 1.5689639564 4.867904e-01 1.2839662393 1.052997e+00 -0.0103116880
## [595,] 0.4441798582 4.226496e-01 -0.0539039397 -3.372031e-03 0.2825697693
## [596,] 0.7769685543 4.070242e-01 0.0261861612 -7.076982e-02 0.7206085390
## [597,] -0.2074257576 1.173212e+00 0.2996496884 2.306304e+00 0.1840209309
## [598,] 3.5252512303 2.887990e+00 1.0662602598 1.226246e+00 0.5446906544
## [599,] 0.8420818410 3.309404e+00 0.6947764051 8.946728e-01 2.4536658867
## [600,] 0.3342120885 5.264917e-01 0.3080197868 2.401099e+00 0.8122708955
## [601,] 1.2664283143 2.534844e+00 2.1716622629 1.392482e-01 1.9160633948
## [602,] 1.4524149862 -1.077639e-02 -0.2383693340 3.472327e-01 1.4435685147
## [603,] 0.5655743744 5.943153e-02 -0.2352493811 1.817164e-01 -0.0675408516
## [604,] 1.8488921261 1.870129e+00 1.4065419035 -1.593749e-01 1.6411155410
## [605,] 0.3347960655 4.723608e-01 1.5231497077 1.725127e-01 0.8105283018
## [606,] 0.0926799207 -1.165285e-01 0.0412918288 1.991891e-01 0.7583609575
## [607,] 0.0235495081 -5.948117e-02 0.2627040486 3.399378e-01 0.8905273127
## [608,] 0.0994858842 1.502910e-01 0.1449165597 8.905582e-01 0.9601429117
## [609,] 2.5693575333 6.176973e+00 1.3310764830 1.503124e+00 0.7515905841
## [610,] 0.6096855617 1.397072e-01 0.5654616464 -8.150540e-02 0.0033170849
## [611,] 1.3202310826 3.325281e-01 0.0627866878 4.065589e-01 0.3183107216
## [612,] 1.2922741360 9.942128e-02 2.3186786020 2.116503e-01 0.1721921121
## [613,] 0.1488632835 3.781717e+00 0.3986110394 -5.334753e-02 1.0509289105
## [614,] 0.3579118257 2.715924e-01 0.2983432929 8.923500e-01 0.8673530091
## [615,] 0.0802113500 9.523883e-02 0.4514906294 1.002669e+00 1.3523132413
## [616,] -0.2008858403 8.956512e-01 0.0411338922 -1.025869e-01 0.2737706293
## [617,] -0.0194404417 1.130665e-01 1.0658588433 -4.233731e-02 1.1125574794
## [618,] 0.9440929651 2.187807e+00 -0.1273722804 2.689955e-01 0.6595643297

```

```

## [619,] 3.9723115012 -1.627139e-01 -0.0602397703 1.233784e+00 0.1314109762
## [620,] 0.6507809283 2.863514e+00 0.5129404033 -6.979590e-02 1.3641099350
## [621,] 0.5033885528 1.596174e-01 0.0574796623 -3.507407e-02 3.7289505289
## [622,] 0.2408022328 7.821396e-01 0.2180475854 1.421816e-01 0.9284597884
## [623,] 1.2514733499 1.635689e+00 1.1060521200 2.298945e+00 0.2745605282
## [624,] 1.2951271317 1.877555e-01 0.2453526019 1.283619e+00 0.7624914748
## [625,] 0.2498649788 -8.729680e-02 0.3364422887 2.537127e+00 0.7134718674
## [626,] 0.9832805623 3.876189e-01 1.7089691563 5.989905e-01 -0.0942672757
## [627,] 0.1402449243 3.907512e-01 0.5625404066 1.046187e+00 2.6968875931
## [628,] 1.0798030451 2.670593e+00 1.0184164064 3.993338e-01 -0.2619280251
## [629,] 1.3589856288 2.383854e-01 0.6284476583 1.592709e+00 1.3655337435
## [630,] 2.5416040392 1.221764e+00 1.6932487962 -2.392355e-01 -0.0737900932
## [631,] 0.1312915027 7.846234e-01 0.9623547295 2.029157e-02 2.6096824670
## [632,] 1.8680838837 9.313873e-02 1.5411500089 3.462851e-01 3.4367180452
## [633,] 0.5018051327 1.167610e+00 1.4108633389 4.024290e-01 0.1338352591
## [634,] 2.2865794370 2.143201e-01 2.3828552597 -2.993048e-01 0.3191129614
## [635,] -0.1250650086 1.131441e+00 2.8320710555 1.496190e+00 0.3436501006
## [636,] 0.7988740948 1.372339e+00 0.2637847818 2.704321e-01 0.3375087607
## [637,] -0.3153093509 3.580321e-01 1.8203688455 2.203476e+00 1.2743548731
## [638,] 0.0605818473 1.654380e+00 0.0113181497 7.289639e-01 1.4326243098
## [639,] 0.1985545771 5.193601e-01 -0.0443309855 6.889434e-01 -0.0497314097
## [640,] 3.3743770783 5.617047e-01 4.8871774844 -4.342126e-01 0.4326964508
## [641,] 1.6548867060 4.087822e-01 2.0883866446 1.308301e+00 4.1534114466
## [642,] -0.1143531561 5.998477e-01 0.1037993906 1.623820e+00 1.5059263124
## [643,] -0.1710153234 3.319208e+00 3.7534661658 -8.124254e-02 0.5883293476
## [644,] 2.6800037849 5.236022e-02 0.8648077495 3.991856e-01 -0.3221259904
## [645,] 3.2053288843 -3.598754e-01 0.0874420072 1.041961e+00 0.2517287576
## [646,] 2.1099984485 1.421206e+00 1.4966068676 4.403140e-02 1.2347505462
## [647,] 0.5096964789 1.502120e-01 0.2747289420 9.187173e-01 0.6087290852
## [648,] 1.5994717469 8.946426e-01 1.1933044103 2.145657e+00 1.4671316188
## [649,] 2.7343378737 8.177452e-01 0.0976857584 9.855626e-01 1.8988659947
## [650,] 0.3917129030 1.305989e+00 3.2507214134 1.156826e+00 1.8897602086
## [651,] 0.5182071873 -3.062947e-01 0.8676608859 3.373331e+00 0.7933413507
## [652,] 0.0180366799 1.173327e+00 1.5348018724 5.485688e-01 -0.0967589090
## [653,] 0.8141651857 6.137820e-01 -0.1014123220 5.456699e-01 -0.1802926549
## [654,] 0.1419375658 -3.679291e-01 1.3925456184 9.158995e-01 1.3605155990
## [655,] 0.3100764053 2.288353e+00 4.9978063440 3.616199e+00 2.1532836656
## [656,] 1.4028679591 6.197570e-01 -0.3725572504 3.366687e-01 -0.2180693911
## [657,] 0.1990332082 5.494370e-01 3.1514005603 1.706243e+00 3.0420651362
## [658,] 0.5474058585 7.060251e-01 1.6789675418 1.530759e+00 -0.1901346310
## [659,] 1.8476967858 -4.788929e-01 -0.1241631430 1.140429e+00 2.4221909465
## [660,] 1.8844510236 1.986528e-01 0.0008388741 9.508036e-02 0.2647636155
## [661,] 0.5551149146 5.907414e-01 0.5677382169 3.685885e-01 0.1599497882
## [662,] 1.2544461868 3.774280e-01 0.5751353317 -3.264876e-01 0.6329227868
## [663,] 4.1011824263 1.915028e+00 0.0805418564 2.143272e-01 0.1175757306
## [664,] 1.9562252369 3.421022e-01 0.4007963611 4.032687e+00 0.0207062842
## [665,] 0.6144315194 1.503569e+00 0.7534371977 -4.378996e-02 1.0269166206
## [666,] 2.7699063793 1.298329e+00 1.9590022372 1.362499e+00 1.7523458238
## [667,] 0.8114120532 5.085307e-02 0.4890480932 3.702067e+00 3.1463936914
## [668,] 0.0734875526 3.160497e+00 2.7083375240 1.621142e-01 0.1660712038
## [669,] 0.2868118612 2.843385e+00 0.1746788843 -3.142115e-01 2.1089138997
## [670,] 0.5518420063 3.203837e-01 0.1660134940 1.355825e+00 0.1190308574
## [671,] 0.7409532981 3.656998e-01 0.3171527276 4.359163e-01 0.3447265189
## [672,] 0.1343131302 4.394968e-01 0.6336090741 -1.435837e-01 2.8626308420

```

```

## [673,] 0.3337114353 2.259550e+00 0.8261785600 3.607348e-01 -0.0859644439
## [674,] 0.6961487032 4.287266e-01 0.0538613943 1.382300e+00 1.1774448200
## [675,] 1.8138577248 9.281044e-01 0.5368711500 6.346782e-01 0.8264280183
## [676,] 0.7880625145 7.425127e-01 2.1275919605 2.154576e-01 -0.0215735446
## [677,] 0.4598868365 1.424269e-01 1.3107495837 1.784614e+00 1.5689120800
## [678,] 0.5574059580 6.564840e+00 1.1165927993 1.302868e-01 0.4364727828
## [679,] 0.2360049233 2.008250e+00 0.5077749932 1.071714e+00 -0.2848408864
## [680,] 0.3832499270 5.696458e-01 1.8288771988 1.390615e-01 0.2352423305
## [681,] 1.0285397681 7.966208e-01 0.8762469786 1.834696e+00 0.3004338801
## [682,] 0.4245396942 4.269463e+00 -0.0571343243 4.091142e-01 0.2311212364
## [683,] 0.6719972657 7.908071e-01 0.2268655954 6.108453e-01 0.0700926501
## [684,] 4.3457766402 5.979411e-01 0.8197016229 6.380359e-01 0.5177383828
## [685,] 0.7359170760 9.608932e-02 0.0979856887 1.230605e-01 1.1451862598
## [686,] 1.4742737785 -5.349390e-01 3.8762472647 3.680717e+00 1.1721984126
## [687,] 2.3292371397 2.057380e-01 0.2825092268 4.463534e-01 1.9793083831
## [688,] 0.6069536038 8.909089e-01 0.7493955104 5.110042e-01 0.8962827038
## [689,] 0.0949809682 9.111533e-01 0.4927922891 7.318850e-01 0.5567265191
## [690,] 0.2702036225 2.273868e-01 0.1698079515 9.967102e-01 -0.0000814911
## [691,] 0.0955732009 1.014462e+00 0.7029498661 1.485167e-01 -0.0284663032
## [692,] 1.5729774694 5.492005e-01 0.7159571394 5.477975e-01 2.3400321564
## [693,] 0.7577357751 1.811316e+00 1.9915359848 9.740051e-01 1.4997312753
## [694,] 1.1939831847 1.372843e+00 1.6220168529 4.199867e-01 0.6177306393
## [695,] 1.0877464654 1.351185e+00 2.4262871778 3.840393e-01 1.5616349531
## [696,] 0.6020066428 8.241673e-01 0.6607296288 5.181559e-01 0.0544348911
## [697,] 1.6322827329 5.670538e-01 1.7753158802 4.026900e-01 0.1958284884
## [698,] 0.5234479040 2.540690e-01 1.2580511704 8.346766e-02 0.4600391404
## [699,] 1.7307317288 6.851289e-01 0.5956328899 9.932064e-01 0.1206019607
## [700,] 0.6508804447 1.984930e+00 2.9172260187 2.663460e+00 4.1719108300
## [701,] 2.1309842929 1.411063e+00 1.1342618931 1.418142e-01 2.4237212995
## [702,] 0.6618191013 8.352982e-01 1.1617686522 5.783194e-01 0.7035906042
## [703,] 1.6981934930 2.025162e+00 4.2832641540 5.026623e+00 -0.1025168441
## [704,] 0.2830652541 1.160829e+00 1.0629972661 1.274963e+00 0.9464874519
## [705,] -0.0859933934 6.737284e-01 2.7705777323 -1.640775e-01 2.4545689653
## [706,] 1.6532576126 -6.219742e-02 1.2601494884 1.512022e+00 0.8495200893
## [707,] 0.6446694188 1.390024e-01 0.9983941734 6.571907e-01 0.2894088742
## [708,] 1.2110493987 1.176932e+00 0.1039468738 4.705137e-01 1.5904867409
## [709,] 1.7281560496 1.786150e+00 0.6443827024 4.140466e+00 0.0355803460
## [710,] 0.6906823175 -7.165729e-02 0.0274962691 4.293924e-01 1.8415516781
## [711,] 0.4061082507 8.017649e-01 -0.0605522590 4.926964e-01 0.8272333235
## [712,] 0.1473544337 8.125398e-01 0.3342928209 1.577542e+00 0.8812463023
## [713,] 3.6491349408 9.307643e-01 1.6355800814 3.286097e+00 0.2550883573
## [714,] 0.8374137718 3.314470e-01 0.1243849654 2.334060e-01 0.7508061136
## [715,] 0.3980101287 7.914014e-01 2.1801296925 1.369772e+00 0.1453792784
## [716,] 1.7579069414 8.319341e-01 0.3164429333 2.625858e+00 0.4702465535
## [717,] 0.7045678446 3.150112e-01 0.7004969876 3.211226e-01 -0.0099274898
## [718,] 0.0486572445 2.423392e-01 3.6637801057 2.647486e+00 0.0670066692
## [719,] 1.0466334450 7.502321e-01 1.1521242777 1.249426e-01 0.4383396254
## [720,] -0.3202686624 2.732970e+00 0.5431292569 5.133180e-01 0.3941778027
## [721,] 0.9179382001 1.962016e+00 1.3055379802 4.322705e+00 0.5692915563
## [722,] 6.9046853289 2.744019e+00 -0.3037682339 1.779542e+00 0.9400956540
## [723,] 0.4653523749 2.023956e+00 0.0748168699 3.157870e+00 0.9180325180
## [724,] 0.2758591012 4.370701e-01 1.9530542092 1.524644e+00 0.4847659649
## [725,] 0.2087286548 1.583621e+00 0.3003581643 1.402363e+00 1.0083022082
## [726,] 0.2667464786 1.388777e+00 0.2538509813 3.479891e-01 0.8529123658

```

```

## [727,] 0.7024407140 1.083993e+00 3.6302627363 -3.166726e-02 -0.0375967418
## [728,] 0.2631930081 1.540918e+00 1.8001728604 -2.528172e-01 0.4467748900
## [729,] -0.0285774506 2.103293e-01 0.2629187165 -1.419632e-01 0.2978776966
## [730,] 0.1550993190 4.949713e-01 0.6399697549 4.159254e-01 -0.0743747292
## [731,] 0.1228131483 2.496111e-01 0.6779035544 -2.059709e-01 0.3917883713
## [732,] 0.1629660379 1.175047e+00 1.0370770930 1.720553e-01 0.8727595960
## [733,] 0.0354871650 7.563383e-01 0.2990413775 1.714514e-01 0.5689739646
## [734,] 0.7132911408 1.060200e+00 1.4168679769 5.155886e-01 2.3802170493
## [735,] 1.3212017818 4.626183e-01 2.9967049253 8.180353e-01 4.6200236303
## [736,] -0.0193226585 2.404825e+00 0.6657708485 9.672824e-01 0.7246344689
## [737,] 0.9636025123 6.446584e-01 1.0508422398 1.351364e+00 2.0930728743
## [738,] 2.5630732774 7.279247e-01 2.2209168494 3.875636e-01 1.0599293240
## [739,] 2.0124074946 1.481936e+00 -0.0441093140 1.122379e+00 0.2237066693
## [740,] 1.6123171926 5.923686e-01 2.0681099547 1.397966e-01 0.6585775314
## [741,] -0.0764893468 1.555091e+00 2.1867850362 1.007725e+00 0.3302244317
## [742,] 0.4252490987 9.209365e-01 -0.0891936971 1.504790e+00 0.7470174921
## [743,] 0.5700366600 9.067795e-01 -0.0801010436 4.283828e-01 1.9758112179
## [744,] 0.4871806978 1.107161e+00 0.0518406216 1.076506e+00 1.3904171728
## [745,] -0.0147106082 5.303474e-01 2.4659890328 1.000894e+00 0.0755347752
## [746,] 0.5354748992 9.957069e-02 -0.0032987132 2.550132e-01 0.3787730476
## [747,] 1.3857286231 -3.203747e-02 1.7926568202 2.059816e-01 0.3468943936
## [748,] 0.2823530117 4.165237e-01 -0.0259304317 1.296137e+00 0.7585935259
## [749,] 1.2215804784 2.694914e-01 0.1012470923 1.588244e+00 6.5329567403
## [750,] 1.5751914795 -1.444784e-01 0.7148668813 1.464619e-01 0.2069771211
## [751,] 0.5287646904 1.448528e+00 0.0338052209 1.228527e-01 0.2562566646
## [752,] 0.6749195521 1.271165e+00 1.1150701002 2.373333e+00 0.5112713716
## [753,] -0.1020756236 3.284773e-01 0.7179370277 2.065349e+00 1.3434283417
## [754,] 2.6042881544 3.805879e-01 1.6570039490 6.338898e+00 3.4828193920
## [755,] 0.4747651749 1.525151e-01 2.3271718327 5.836130e-01 0.2187480138
## [756,] 2.4298433792 2.822185e+00 1.0096582023 7.047749e-01 0.4151204733
## [757,] 0.6738134848 1.843738e+00 2.9525020331 9.811483e-01 0.5113605977
## [758,] 0.4136245436 1.606454e-01 0.3557030268 7.479347e-01 0.8038865068
## [759,] 0.0134906167 1.628167e+00 0.1665514858 2.652778e+00 0.0845872182
## [760,] 1.0281211353 1.127507e+00 1.6220323547 7.376200e-01 1.7441141707
## [761,] 0.2926297559 1.659995e+00 0.0572944830 2.678539e+00 0.0048521764
## [762,] 1.3432540085 3.268435e+00 2.2269861201 2.556468e+00 0.4204077281
## [763,] 0.8015013861 4.806810e-01 0.9131101327 1.176470e-01 0.8683489125
## [764,] 0.8344684516 6.103034e-01 0.1873990690 3.329225e-01 0.6411868350
## [765,] 0.0237041270 1.141973e+00 2.3318810250 2.035482e-01 0.6334452130
## [766,] 1.0878455848 5.442173e-01 0.7466988156 1.519979e+00 2.0017892904
## [767,] 0.5488395373 8.484500e-01 -0.1751837798 2.456836e+00 0.1003087397
## [768,] -0.0803820271 1.702969e+00 2.3473125134 2.395167e+00 1.6356558184
## [769,] 0.6501669584 -3.813542e-02 2.8568844712 1.408543e+00 0.1670201936
## [770,] 0.1648526210 5.092446e-02 -0.1683305290 6.269179e-01 1.5337156166
## [771,] 1.8152377858 6.998616e-01 1.3354031084 5.201378e+00 -0.1167868171
## [772,] 0.1840110187 1.177646e-01 1.6768076514 8.081258e-01 -0.0906906634
## [773,] 0.3228280938 2.653966e-01 0.6253557450 1.583368e+00 1.8665685067
## [774,] 0.1447767109 5.919723e-01 -0.0653633701 5.843637e-01 0.9830642027
## [775,] 2.4027136116 1.155218e+00 1.1038125070 2.706755e+00 0.9283234843
## [776,] 1.1125170771 2.819934e+00 2.3126100340 2.077494e+00 1.2524654412
## [777,] -0.0113823821 3.214776e-01 0.4053459973 3.612998e-01 0.2192715827
## [778,] 1.0923588676 1.730197e+00 0.5256456818 6.264022e-01 1.7810332756
## [779,] -0.0008201892 6.326993e-01 0.6796135168 -1.830197e-02 0.8700645375
## [780,] -0.0271646786 2.189204e+00 2.3833408200 3.864516e-01 0.2411565860

```

```

## [781,] 0.8021259509 -7.334162e-02 0.5289331368 5.920328e-01 0.9306524029
## [782,] 0.5823797988 1.057419e+00 -0.0710332256 -1.728236e-01 0.1446261313
## [783,] 0.1141698222 9.280068e-01 0.5585151952 1.411330e-01 0.5574751940
## [784,] 0.9953629573 1.298535e-02 1.5304405550 1.138488e+00 -0.0576020567
## [785,] 0.8383428963 3.066307e-01 0.7856775853 1.333642e+00 1.4152289618
## [786,] 0.3613419864 7.806318e-01 0.2279963269 1.551708e-01 0.5394902474
## [787,] 0.3427933963 4.580186e-01 1.3310326085 3.006441e-02 1.4822306002
## [788,] 0.2249095856 2.781175e+00 2.6014550474 6.670074e-02 -0.0995480896
## [789,] 1.7868771788 -2.180471e-02 0.7069168589 1.700117e+00 1.2285349046
## [790,] 0.5186236501 -1.229272e-01 0.6277596329 2.648807e+00 0.4768126143
## [791,] -0.1645209649 2.191627e+00 0.8697173803 3.189232e-01 2.0390021585
## [792,] -0.0081542803 9.762418e-01 1.2685529477 1.114096e+00 -0.0392136413
## [793,] 1.6543842861 1.480788e+00 0.3713620294 4.808582e-05 0.3616574526
## [794,] 0.0650423764 6.585160e-01 1.1806080211 1.107303e+00 0.2751632423
## [795,] 1.3265573163 -1.898262e-01 0.6933892387 5.504306e-01 1.1692750256
## [796,] -0.0168001141 -3.493806e-02 0.9002726569 8.225119e-01 0.4203445138
## [797,] -0.3120251953 1.102012e+00 2.2668460290 3.833112e-01 0.8929411934
## [798,] 0.4298214991 6.115784e-01 0.7195858233 1.722278e+00 0.7923767487
## [799,] 0.0555354963 5.306856e-01 1.5539398538 1.629200e+00 0.4526234695
## [800,] 0.1420404472 8.170010e-02 -0.1060662826 8.331034e-01 0.1657144020
## [801,] -0.0978889576 3.481711e+00 0.2539246613 -2.013063e-02 0.0247919908
## [802,] 1.3062042886 1.445829e+00 2.1614755305 7.751456e-01 0.9826848625
## [803,] 0.7084738131 -1.477154e-01 0.4472165924 2.544047e-01 0.2987453420
## [804,] 0.0313919346 1.024155e+00 0.5152582443 -2.634781e-01 0.0045292889
## [805,] 2.9005553214 3.902116e+00 0.9889989346 2.791289e+00 0.9927276038
## [806,] 0.5075057802 6.985607e-01 0.5587299382 5.093041e-01 0.0182447291
## [807,] 0.7219597816 6.062843e-01 0.6118991780 1.468544e+00 0.8525376871
## [808,] -0.0125126517 1.055923e-01 0.7189382854 3.629030e+00 1.7692835594
## [809,] 0.2198468291 6.744941e-01 0.1843633482 6.532918e-01 0.1868693445
## [810,] 0.3484946199 3.717786e+00 3.0645790850 1.143628e+00 0.5099532165
## [811,] 0.8188663688 2.405942e+00 0.0194131611 2.627166e+00 0.8258958782
## [812,] 0.2083938840 2.098325e+00 1.6872863702 1.243993e+00 0.3135319545
## [813,] 2.3408307724 9.511189e-01 0.1518452648 5.838844e-01 -0.0165960475
## [814,] 2.7539484225 8.937837e-01 2.1872921451 8.034155e-01 0.2141944909
## [815,] 2.0843632741 3.066577e+00 1.1154486130 1.599555e+00 1.3652037838
## [816,] 0.9431527344 -9.026035e-02 1.1957440903 7.401385e-01 1.5643014306
## [817,] 2.6490127213 1.540623e+00 0.8641938772 5.183578e-01 0.4969404314
## [818,] 0.1785313769 3.439870e+00 0.8874953486 8.283546e-01 0.2741172810
## [819,] 0.7036869861 -3.228085e-01 0.7601861848 1.192283e-01 -0.1124815643
## [820,] 1.1626253336 1.556922e+00 0.4588441144 4.587552e-01 0.6972871968
## [821,] 0.2807160759 7.835313e-02 -0.1167910732 6.252725e-01 0.2721753745
## [822,] -0.0477309481 1.988206e+00 2.4818334337 6.439791e-03 -0.4205493483
## [823,] -0.2738784324 1.936485e+00 -0.3013083862 4.998382e-01 2.9963625564
## [824,] 0.2079436847 2.891996e+00 4.2444328072 3.755153e-01 0.7031944905
## [825,] 0.3716786914 5.451441e-01 2.3072728815 8.336535e+00 -0.2299472410
## [826,] 0.1275719337 -1.586928e-01 0.5781809328 6.429494e-01 1.3455522279
## [827,] 0.1181898706 2.021316e+00 0.2160585604 1.306382e-02 0.3468130506
## [828,] 1.8340990476 1.610968e-01 0.8892545304 1.713020e+00 1.4690166848
## [829,] 0.3657270114 3.282479e+00 1.8096932804 1.787832e-01 0.0855904789
## [830,] 1.3675176416 -6.202788e-02 0.5670548826 1.928526e+00 3.3293002773
## [831,] 0.4130019887 1.381957e-01 0.3219389790 1.420946e+00 0.3855691096
## [832,] 1.0773014023 2.460299e+00 0.5949497323 1.055012e+00 0.3155229684
## [833,] 0.4690347533 1.093353e+00 0.5219210206 2.181510e-01 0.9243415404
## [834,] 0.4221882317 -2.500450e-01 0.9085187901 2.788895e-01 0.4159001570

```

```

## [835,] 1.4002442645 6.149885e-01 1.9798522888 2.826712e+00 0.3846970927
## [836,] 0.6602111531 2.399051e-01 0.5949959157 -3.235726e-02 0.2841868809
## [837,] 0.0890421849 6.967566e-02 2.5672194233 1.011560e+00 1.0165052273
## [838,] 1.1143817200 4.205835e-01 0.4906119856 1.943973e+00 4.2124469624
## [839,] 0.5097417307 1.358263e-01 1.4138272987 6.237157e-01 1.1870472079
## [840,] -0.2751520672 1.064707e+00 1.1803590180 2.180296e+00 2.2705916003
## [841,] -0.1455329270 1.655312e+00 0.2129886610 1.382575e-01 0.5239710393
## [842,] 1.4453561538 4.285922e-01 0.5760978946 4.242736e-01 -0.1157857470
## [843,] 3.5256075695 1.156392e+00 0.3293873926 1.899971e+00 -0.1523647800
## [844,] 1.5580677867 1.982805e-01 2.1127028466 4.094006e-01 0.9884421815
## [845,] 0.4117471599 -3.503181e-02 1.8015057095 -4.246570e-03 0.4128099579
## [846,] 2.1415490638 8.950392e-01 3.7956167372 1.061428e+00 0.2306477342
## [847,] 0.6515215938 -7.433686e-02 1.3540669814 3.568010e-01 0.9657782533
## [848,] 7.2717506168 4.674251e-01 0.0803369971 5.095273e+00 0.0934072744
## [849,] 0.0405405295 9.444839e-01 2.4966452196 7.990423e-01 0.1607021960
## [850,] 1.1022886928 7.847193e-01 0.3188907000 1.056878e+00 0.1588684326
## [851,] 0.7856419457 1.015427e+00 1.8916343518 3.062598e+00 0.1171746824
## [852,] 0.9682518693 1.745306e+00 0.1130176502 3.244493e+00 1.5053638006
## [853,] 1.8191393650 2.296855e+00 0.2857526721 6.407164e-01 1.7901106910
## [854,] 1.2848149732 -9.430093e-05 0.2204099203 3.560210e+00 2.0728328344
## [855,] 1.4875986420 1.184680e-01 0.0761581917 2.332189e+00 1.1729418274
## [856,] 0.9729406680 1.097436e+00 0.5367947773 7.253212e-01 0.5221340761
## [857,] 0.0579031762 -1.546317e-01 -0.1586016475 1.565042e+00 1.1793009345
## [858,] 0.5918592108 1.540381e-01 0.5253020709 -2.043446e-01 1.7488648460
## [859,] 0.7738848812 1.516980e-01 1.0674067325 -3.598568e-02 1.9337159610
## [860,] -0.3849288214 1.659825e-01 1.1054300167 -7.427583e-02 2.8966406361
## [861,] 2.1745835678 1.320417e+00 0.4206198495 5.936732e-01 -0.2041399851
## [862,] 0.0520739441 1.027530e-01 0.3688707834 8.469471e-01 -0.1773600747
## [863,] 0.6847483218 3.919203e-01 0.0551448790 1.299465e+00 0.4201633932
## [864,] 1.3295770045 6.052681e-01 2.7101367629 8.390495e-01 0.5243817303
## [865,] 0.9073674969 4.485770e-01 -0.0522569752 1.561312e+00 0.2636622239
## [866,] 0.1085378340 4.600585e-01 0.2465840641 3.861154e-01 0.4175238058
## [867,] 3.3015135341 1.944715e-01 1.3513726525 5.413886e-01 -0.0052963215
## [868,] 1.0660440246 2.217683e-01 1.2076728117 1.705358e+00 6.6368835799
## [869,] 1.1583941785 1.021745e+00 0.1987319595 2.342204e-01 0.4039785582
## [870,] 2.4357317749 1.001696e+00 1.6348218456 1.680579e+00 1.7635643551
## [871,] 1.1724942020 4.762650e-01 2.5050665673 -1.887938e-01 -0.1893457868
## [872,] 0.0388461747 1.419802e+00 0.6106051143 2.628694e-01 2.4513557679
## [873,] 2.1109278285 4.527697e+00 -0.3689966834 1.767203e+00 0.1350465515
## [874,] 1.2043999620 -2.125792e-01 0.1813239567 8.209927e-01 1.2002222480
## [875,] 2.4328452674 6.509282e-01 0.1339225234 6.856855e-01 1.1968476387
## [876,] 0.0552142158 1.831236e+00 -0.5041483373 2.093336e+00 3.0555162429
## [877,] 0.5291983738 -7.620157e-02 0.9028659714 4.705345e-01 0.0734462371
## [878,] 0.3308241590 5.233124e-01 1.1876609274 3.011164e-01 0.0042154361
## [879,] 1.3714607268 3.965080e-01 1.6893190164 4.103716e-01 0.4006653952
## [880,] 0.8120014173 -4.373699e-02 0.2349149083 -1.359801e-02 -0.3840625068
## [881,] 0.3054018635 3.662535e-01 0.9669976538 -2.132741e-01 -0.0511026234
## [882,] 1.3762512252 3.871367e+00 0.7614636269 2.267716e+00 2.1094998919
## [883,] 0.8911893412 3.771205e-01 -0.0084374671 1.490130e+00 0.8743318669
## [884,] 0.8547668206 -8.033687e-03 2.8187301073 2.542928e+00 -0.0423942477
## [885,] 0.7680580801 3.887336e-01 0.4077899811 -1.427389e-01 0.6929559280
## [886,] 0.4313389209 7.051708e-01 1.5652607048 1.887904e+00 1.9114725049
## [887,] 1.0241437974 1.493953e+00 0.3205641727 7.849483e-01 0.0339816760
## [888,] 1.5626873325 2.720745e-01 1.2283742219 1.296599e+00 0.0553231322

```

```

## [889,] 1.8062899711 9.525524e-01 1.1787921464 4.051992e-01 0.8520707319
## [890,] 0.3331336593 9.854920e-01 0.6131713667 -2.880520e-01 0.4635902121
## [891,] 0.6862598563 1.737027e+00 0.4860833232 1.173418e+00 0.8540850981
## [892,] 0.0677295985 1.041913e-01 2.3381227521 4.533810e-01 0.9270679347
## [893,] 1.0832498491 -8.942951e-02 0.8673835166 3.307389e-01 0.6220046479
## [894,] 0.8880115899 5.781429e-01 -0.0315362229 1.849767e+00 0.7504950358
## [895,] 0.0779046641 1.075639e+00 0.1553422238 3.895744e-01 1.0868052093
## [896,] 2.8974031078 9.622580e-02 1.2854194077 2.026021e-01 0.3726552294
## [897,] 1.6048097751 4.482475e-01 0.3921467885 2.211800e-01 0.1758508568
## [898,] 3.2678157484 1.328944e+00 0.4469326974 2.238641e+00 0.2394592105
## [899,] 0.7423282287 1.667621e-01 4.7656813843 3.132403e-01 2.1353817777
## [900,] 0.7450030142 -4.321802e-01 0.1983908767 -9.586823e-02 1.2055842682
## [901,] 1.5822985322 2.197920e-01 0.5062059430 1.355893e+00 0.9323955487
## [902,] 0.1387417915 1.001315e+00 0.0405412119 1.781424e+00 0.6496900998
## [903,] 0.4013598895 9.797361e-01 -0.0506860216 3.332937e+00 -0.2306060438
## [904,] 1.9072011798 3.712234e-01 0.0382049934 5.602184e-01 1.4359851383
## [905,] 0.1642642526 2.705182e+00 -0.2985771015 1.596188e+00 0.6206630331
## [906,] 0.6588167025 2.491553e+00 4.3032482861 1.202612e+00 0.1702690231
## [907,] -0.1199574804 1.680107e+00 1.1123775971 9.925802e-01 0.6372923515
## [908,] -0.0299007862 3.116687e-01 -0.0834494661 1.461979e+00 0.1770711316
## [909,] 1.7257628598 4.067666e-01 1.4786470455 4.852550e-01 0.7477366137
## [910,] 0.0057770400 1.627510e-01 1.4994959837 3.639973e+00 0.9435816184
## [911,] 2.4076374241 4.289654e+00 0.6091319693 8.349724e-01 3.8699472223
## [912,] 1.7236282387 1.401567e+00 0.9883142985 3.802724e+00 0.9320175621
## [913,] 0.4840608845 -5.169460e-02 1.5852813811 1.635992e+00 4.7590740487
## [914,] 0.3087747614 1.691002e-02 0.2086917464 -1.341545e-01 -0.2497780251
## [915,] 0.1186077989 2.024776e-01 0.3914416230 9.948509e-01 0.4098023755
## [916,] 0.8459394322 9.940655e-01 2.6594667152 4.922993e-01 2.3161362901
## [917,] 0.0730656311 2.743969e+00 4.6393304172 6.118198e-02 2.2212362515
## [918,] 0.9045357353 9.530121e-01 2.2567214431 -1.914617e-01 1.1107442654
## [919,] 0.6012883530 6.683209e-02 0.5021563538 8.390184e-01 -0.1367985948
## [920,] 0.4570797916 1.196861e+00 0.4444412573 5.228512e-01 0.4175462422
## [921,] 2.3377846591 -3.900810e-01 1.4627466727 4.148684e-01 3.4363975211
## [922,] 1.1388335146 1.146838e-02 0.5866888389 2.645406e-01 2.6961411669
## [923,] 1.6376680509 8.606989e+00 -0.3759604207 1.726866e-01 0.6673342844
## [924,] 4.7966992907 2.284009e+00 2.6749331538 8.800850e-01 1.0642963731
## [925,] 0.6654622438 9.085759e-01 0.1811093438 1.810128e+00 0.1181234600
## [926,] 1.7692004847 -3.906795e-01 0.6962536021 9.239956e-01 0.2524837552
## [927,] 1.0335989876 8.161647e-02 0.8831480384 4.567321e-01 0.0659106088
## [928,] 0.8634442891 7.788652e-01 0.8937484211 1.383550e+00 0.1658066282
## [929,] 2.8433085602 1.780612e-01 0.2581859704 1.763104e-01 0.1731977919
## [930,] 0.0568457883 1.265493e-02 -0.1389720454 1.623661e+00 1.1374609320
## [931,] 2.3337201652 1.704919e-01 -0.2599610928 6.895356e-02 2.1150688446
## [932,] 2.4096501665 7.768131e-01 0.1884966486 6.948618e-01 1.3337790178
## [933,] 0.9301937661 2.743531e+00 0.9009451963 5.008158e-01 2.5330608786
## [934,] 2.7021889199 6.903601e-01 1.2046458654 3.856337e-01 2.3309446013
## [935,] 0.8093560518 6.488467e-01 0.3123063339 1.783207e-01 1.3041435429
## [936,] 3.7100964070 -2.232420e-01 0.0348442080 4.302840e-01 0.1486098657
## [937,] 0.2649448705 -1.247287e-02 0.8597849788 9.082957e-01 0.3777207853
## [938,] -0.0612181835 1.505219e+00 0.3487269054 -1.716247e-01 0.6295653057
## [939,] 1.7427281561 2.006732e+00 0.2859056556 9.066729e-01 1.6721930993
## [940,] 0.8988625662 8.798513e-01 0.1371384164 1.906641e-01 1.0424447234
## [941,] 1.6712025955 8.361675e-02 3.6748421395 1.707417e+00 1.4646604910
## [942,] 0.4239204382 2.102444e+00 1.0827458211 1.426858e+00 0.2792787379

```

```

## [943,] 0.4710045309 -1.873936e-01 3.7140885469 3.507625e-01 0.2527660709
## [944,] 1.3723602910 1.713064e+00 1.0661844883 2.307600e+00 1.8536521825
## [945,] 0.1681445523 9.810698e-01 0.9213273714 1.920858e+00 -0.4614631468
## [946,] 1.0476255071 3.414632e-01 1.3339647622 4.996295e-01 0.6995902877
## [947,] -0.0409362944 1.771023e+00 0.0966584668 6.389112e-01 -0.2191229267
## [948,] -0.1308118726 1.730417e+00 0.4086060141 2.076385e+00 0.5968074379
## [949,] 0.7420862998 -6.569270e-02 0.8247921682 1.192609e+00 0.1660419780
## [950,] 0.8364784416 -1.974909e-01 0.9947686653 1.327401e-01 0.5110646437
## [951,] 0.6990146141 2.216093e-01 0.1333150959 -7.197227e-02 0.2800525215
## [952,] 0.2868047746 4.234206e-01 0.5868822889 9.018570e-01 0.8030743528
## [953,] 0.5470639960 2.436776e+00 0.9000698892 3.901211e+00 1.8645759226
## [954,] 0.3878675731 5.635379e-01 0.0651738430 1.756004e+00 1.8780380557
## [955,] 0.0260919290 7.156507e+00 2.5552095945 1.399408e+00 1.2516891167
## [956,] 0.4863571498 1.928339e+00 0.4796588869 1.139362e+00 0.8569539837
## [957,] 0.8875173462 -2.398184e-01 1.0064291605 9.430387e-01 4.2726855828
## [958,] 3.5397378134 -3.438810e-02 0.8725770341 1.183468e+00 0.3150063049
## [959,] 1.3259396437 -1.283820e-02 0.4316297094 4.635803e-01 0.7689807404
## [960,] 0.5578455118 1.976361e+00 0.8472775381 3.706053e-01 1.1852338568
## [961,] 0.5100311661 3.835942e-02 0.7171801700 1.853701e+00 0.9545578352
## [962,] 0.4356552470 2.500497e-01 0.9874450878 5.154221e+00 3.6504497164
## [963,] 3.2908048625 8.838747e-01 1.5209792978 1.515632e+00 1.9438952478
## [964,] 0.5361793027 9.825053e-01 0.6875254635 4.303114e-01 0.0957080001
## [965,] 0.4598789647 3.279112e+00 0.9112292156 4.959634e-01 2.8262646075
## [966,] -0.0217875243 7.117806e-02 1.2098660317 -4.917054e-03 1.9118275991
## [967,] 0.1722055655 5.854432e-01 0.9177164733 2.419807e+00 0.7049058041
## [968,] 0.5966133398 1.124830e+00 -0.1930717117 2.156234e-01 0.9426840152
## [969,] 0.7562613371 -3.118207e-02 3.2285748293 1.339643e+00 1.2733756930
## [970,] 1.8839141213 9.905043e-01 -0.0402349230 4.310060e-01 0.7236441930
## [971,] -0.0552773193 3.202773e+00 0.2425320921 1.641375e+00 3.0048955519
## [972,] 1.1826260003 1.416323e-01 0.5534980838 3.893204e-01 1.6000479823
## [973,] -0.1305558034 1.597195e+00 0.4661341514 1.919880e-01 1.1961208258
## [974,] 0.1483401827 4.783887e-01 1.5337775784 1.126174e-01 0.2014065210
## [975,] 3.4847204993 2.963253e+00 -0.1124988909 1.217715e-02 0.7191956261
## [976,] 0.3567173990 1.246507e-01 0.5244455835 2.997292e+00 1.3230740405
## [977,] 0.7767486272 1.844168e+00 0.8931148088 6.651192e-02 0.2264927735
## [978,] 0.2541222682 1.814155e+00 0.2224468755 1.975251e+00 0.8408207340
## [979,] 1.4249030724 4.913688e-01 1.9073083512 -2.596322e-01 0.5163423688
## [980,] 7.3838041169 3.786582e+00 -0.0010203283 3.338614e+00 0.8916009674
## [981,] 0.4679226843 -1.200640e-01 1.0610557826 1.215263e+00 0.0940827301
## [982,] 1.3713051963 3.605935e-01 1.7688035150 -2.642521e-01 5.1173756402
## [983,] 0.2802920729 1.811679e-01 0.6339900907 7.378142e-01 1.3999509398
## [984,] 0.7953558843 -2.672476e-01 1.7105240110 1.460327e+00 1.0940587213
## [985,] 2.3456316081 8.252205e-01 1.8317074586 3.514126e-01 -0.1990043844
## [986,] 0.1392639353 6.400774e-01 0.7584696441 2.491328e-01 1.4748786194
## [987,] 0.7239554904 1.597911e+00 1.8190789554 6.293127e-01 0.5299840355
## [988,] 1.3523971608 2.093465e-01 1.1763665575 2.017631e-01 2.0116041587
## [989,] 0.1432584629 1.577687e+00 1.0859883388 8.470585e-02 3.5232097737
## [990,] 0.9480746634 -1.293587e-01 0.3433597939 6.800680e-01 -0.1267213175
## [991,] 0.6227015820 -1.334806e-01 0.1410381992 -1.005958e-01 1.2736169652
## [992,] 0.5876660134 3.133596e+00 0.9232788250 2.386532e+00 0.3052945543
## [993,] 0.9654877734 5.289122e-01 0.5721905232 3.440617e-01 0.1126299639
## [994,] 1.2050179072 8.831671e-01 0.6703999231 -1.282520e-03 0.2471679995
## [995,] 1.0891491349 6.226579e-01 -0.1171254796 8.086002e-01 2.2357287604
## [996,] 1.7358461510 1.407795e-01 0.7499727130 9.024320e-01 1.3176542239

```

```

## [997,] 0.7805942143 1.370089e+00 0.0893905189 1.043583e+00 1.7940204345
## [998,] -0.3756382280 3.006101e-01 0.9592793255 1.106382e+00 1.1384063030
## [999,] 0.3387549785 -3.155863e-01 0.7380382803 2.533471e+00 1.1363885544
## [,6]      [,7]      [,8]      [,9]      [,10]
## [1,] 0.485648795 0.189391772 0.6386401069 -6.308259e-02 1.083839e+00
## [2,] 0.616376300 0.088024484 0.8583093452 2.257419e+00 1.293392e+00
## [3,] 2.536393928 0.096760897 0.4501790456 3.015288e+00 1.448988e+00
## [4,] 0.139209194 1.288416034 0.2132450000 6.512274e-01 1.339886e-01
## [5,] 0.252018920 0.430212562 0.1141704128 5.863533e-01 8.187770e-01
## [6,] 3.273673265 2.156395821 -0.0694556334 2.301002e-01 1.146853e-01
## [7,] 1.514747464 0.151886627 0.2126372415 3.272644e-01 1.177292e+00
## [8,] 0.976435612 0.518242997 0.5408401428 1.723875e+00 9.588025e-01
## [9,] 1.019550588 0.649983045 -0.0249003854 6.844903e-03 8.027694e-01
## [10,] 2.245309670 0.059123791 0.4128668198 2.352686e-01 6.855069e-02
## [11,] 0.032071226 0.364982085 0.4365623736 9.522210e-01 3.721241e-01
## [12,] 4.430786061 1.611509943 0.2134054549 5.539270e-01 6.328518e-02
## [13,] 0.890390982 3.088986478 0.1464386664 7.269316e-02 2.597449e-01
## [14,] 0.946921904 0.029864161 0.6344106124 4.034610e+00 1.266751e+00
## [15,] 0.120297146 1.676874772 1.8808334868 2.131404e-01 1.133921e-01
## [16,] -0.109214162 0.373442870 3.7534396148 2.673094e-01 9.395867e-02
## [17,] 0.209946809 0.045741392 2.3308738472 2.162032e-01 7.487469e-01
## [18,] 0.328898315 -0.025577499 -0.2576039452 2.073270e+00 1.050077e+00
## [19,] 3.934544214 0.535742681 0.9894498133 6.540782e-01 3.687242e+00
## [20,] 2.639550123 1.069622322 0.7285279197 3.623353e+00 5.221100e-02
## [21,] 1.767644203 1.893374583 0.1535875817 2.375775e+00 7.873403e-01
## [22,] 0.980406231 0.198534543 0.0043312808 2.274600e-01 1.368586e+00
## [23,] -0.148485734 0.740400068 1.4492515614 8.981511e-03 2.966757e+00
## [24,] 3.439314538 0.560418966 0.9398137055 2.320672e-01 -2.370951e-01
## [25,] 1.808843482 2.087023984 2.2265076998 1.337589e+00 2.380902e+00
## [26,] 0.312546156 1.387645436 1.8749897358 3.179316e-01 6.587213e-01
## [27,] -0.265624906 -0.015163036 3.7334013392 7.644683e-02 6.567061e-01
## [28,] -0.501713423 3.676403694 1.5171209411 1.875895e+00 3.325672e+00
## [29,] 1.003043003 0.453825314 0.9512652285 -7.861501e-02 2.555700e+00
## [30,] 0.123076108 1.058609839 0.3164115596 1.399941e-01 4.111265e+00
## [31,] 0.334636261 0.185281494 1.4552473657 3.048709e-01 -8.987368e-02
## [32,] 0.755254200 6.200747197 0.3524752715 6.155217e-04 7.003551e-01
## [33,] 0.985286637 -0.018267622 0.4518626733 1.889371e-03 1.959959e+00
## [34,] 0.536064819 0.330810440 1.8102937400 8.113978e-02 9.780266e-01
## [35,] 0.712396719 1.118988335 0.6135905377 3.452004e+00 3.642849e-01
## [36,] 4.187016163 0.609753316 -0.0888162148 7.951915e-01 1.081400e-01
## [37,] 0.613334216 -0.124037859 0.4589716255 2.007879e+00 5.225581e-01
## [38,] 5.400110344 0.028773601 0.5518349938 3.259892e+00 3.093602e+00
## [39,] 0.438229856 1.358112524 1.1941855999 6.027560e-01 3.982520e-01
## [40,] 0.384467807 0.560622880 0.4971792576 4.266607e-02 1.830353e+00
## [41,] 0.535802123 0.477766574 -0.1838907814 1.279705e+00 1.458926e+00
## [42,] 0.583824858 0.282567877 0.6110151256 1.750313e+00 -1.114278e-01
## [43,] 1.938641265 0.498331789 1.6497418709 8.696175e-02 -9.273436e-02
## [44,] 0.395374174 0.612743646 -0.2161981193 1.363189e+00 4.714580e-03
## [45,] 0.622954248 0.223074469 3.0879988204 4.506713e+00 2.842977e-01
## [46,] 2.981103076 6.521703033 6.9294353782 2.646939e-01 2.845605e+00
## [47,] 0.668258804 -0.492529686 1.2074576093 1.496588e+00 7.008548e-01
## [48,] 0.290434917 2.348543152 1.6123606010 1.008455e-01 4.751431e-01
## [49,] 1.865896022 4.778115560 0.9446378617 3.078993e+00 -5.353751e-01
## [50,] 0.712814986 0.332365559 0.2558396228 2.591381e-01 3.524393e-01

```

```

## [51,] 0.534340530 2.560893955 2.3773459555 2.419828e-01 1.498557e+00
## [52,] 0.683956504 -0.111270609 0.8191708028 2.777769e-01 2.956934e-01
## [53,] 0.234873623 0.509461496 0.2202364419 1.594756e-01 5.953910e-01
## [54,] 0.396627358 2.260497554 4.8013703048 1.779244e-01 6.720326e-01
## [55,] 0.199072171 0.646087696 0.0532036065 6.781053e-03 4.058290e-01
## [56,] -0.176124143 0.134693646 0.6931260331 9.160534e-01 4.937879e-01
## [57,] 0.699142137 1.918434912 2.0916064090 1.275701e+00 2.564431e-01
## [58,] 0.245656628 0.347850356 2.1667050016 -2.659165e-01 5.758935e-01
## [59,] 1.835754397 1.017853725 0.2099179792 1.641026e+00 9.757503e-01
## [60,] -0.068991112 1.322243444 1.1613925933 6.650800e-01 4.130577e-01
## [61,] 0.446048633 0.243138438 1.1546399959 1.303083e+00 2.609262e-01
## [62,] -0.166986175 1.865987495 0.1447432775 2.257486e+00 1.749602e-01
## [63,] -0.195657049 0.637359331 3.2622039818 -1.454375e-01 6.993070e-01
## [64,] 0.070673571 0.048713483 0.4502433987 1.949851e+00 3.930534e-01
## [65,] -0.076194517 2.343687209 4.0117968850 -1.029108e-01 5.507947e-02
## [66,] 2.640811864 -0.145793151 0.3783650295 1.106722e+00 1.122961e+00
## [67,] 1.359625806 0.141730511 0.8938681430 3.590371e-01 4.900099e+00
## [68,] 1.213305842 0.001384768 0.9614217626 1.645226e+00 9.177110e-01
## [69,] 1.817325855 2.312668836 0.6614033839 1.486690e+00 1.041660e+00
## [70,] 2.344318184 0.673042240 1.2483800402 2.550977e-01 1.341231e-02
## [71,] 3.623184026 2.596625624 2.7785039913 -2.964274e-01 1.102599e-01
## [72,] 0.574042923 0.891974234 3.5535340797 1.320752e+00 1.950447e+00
## [73,] 1.646416531 1.250280230 -0.1175864805 3.074352e+00 1.184087e-01
## [74,] 0.778441041 1.312101924 0.8144454548 2.159942e+00 6.272125e-01
## [75,] 0.674353754 0.605980555 0.5456716981 1.661496e-01 2.184321e-01
## [76,] 0.408078340 1.202822733 2.4800645941 1.259987e-01 -2.029451e-01
## [77,] 0.636497185 0.394304243 1.2892533528 2.280639e+00 -4.481356e-02
## [78,] 1.004914517 0.902786238 0.1311472645 7.151747e-01 9.512634e-01
## [79,] 2.040563416 1.162080109 0.3292231900 1.540163e+00 1.733148e+00
## [80,] 1.487293953 4.126708966 1.8072847296 1.192450e+00 4.035080e-01
## [81,] 1.398681620 2.048089160 0.0747226969 2.344052e-01 1.323330e-01
## [82,] 2.425172247 0.071489305 1.4453133516 -6.943445e-02 5.102463e-01
## [83,] 3.163507543 1.050491967 1.8297726191 3.522718e-01 5.258628e-01
## [84,] 5.402033703 0.828893793 0.9107043683 2.354431e+00 2.882099e+00
## [85,] 0.770997952 1.268257594 0.0936861632 8.617668e-01 8.593079e-01
## [86,] 0.201266451 0.468531613 0.3708452308 4.600312e-01 9.421249e-01
## [87,] 0.086549960 1.407920091 0.0615889193 1.013066e+00 3.047665e-01
## [88,] 2.306544067 0.654507551 0.1722997417 6.065866e+00 9.503232e-01
## [89,] 2.534437346 0.522526971 1.0607505566 7.693429e-01 1.616557e+00
## [90,] 2.464301719 0.855179498 0.4742411973 1.007019e+00 2.905814e+00
## [91,] 1.343140764 0.459265324 -0.1032807684 1.252638e+00 7.097854e-01
## [92,] 0.731116591 1.754689636 0.3074443891 1.825270e-01 -4.157857e-02
## [93,] 2.801984018 -0.100109451 0.0595089536 3.979749e-01 9.128147e-01
## [94,] 0.459755346 0.263485503 3.7197093208 2.126817e+00 2.366864e+00
## [95,] 0.836484836 0.117439103 1.6086037352 2.931264e-01 2.844762e-01
## [96,] -0.232314859 0.121452131 0.3975377516 5.273148e-01 4.079111e-02
## [97,] 1.174226613 6.327900292 0.7458962741 4.514694e-01 2.318360e-01
## [98,] 1.673635460 14.007196010 2.0422723034 2.838894e+00 1.211534e+00
## [99,] 1.125415796 0.421795718 -0.0930734964 2.900134e-01 -1.868412e-01
## [100,] 1.433246592 0.829939922 1.5187316083 1.640497e-01 9.834001e-01
## [101,] 0.719020094 4.093576262 2.2107701596 -4.610116e-01 7.164220e-01
## [102,] 4.900953963 0.234740817 -0.2240961984 -8.514975e-02 8.179608e-01
## [103,] 0.124637025 0.785189973 1.2702272082 -1.567727e-01 1.631104e+00
## [104,] 2.309180992 0.461039970 1.1650637930 5.893227e-01 5.285182e-02

```

```

## [105,] 5.802382955 -0.189401595 0.2743862757 2.430809e-01 1.522884e-01
## [106,] 5.900480609 2.214390371 0.0014456243 1.269730e+01 2.761179e+00
## [107,] 1.225475263 1.627587487 0.5705734224 2.657869e+00 1.207995e+00
## [108,] 2.840823381 0.997423018 3.6166545131 2.595934e+00 8.713819e-01
## [109,] 0.762691930 1.425713684 -0.1499898188 2.666493e+00 2.640780e+00
## [110,] 2.186416417 0.195114206 0.1505801509 5.824126e-02 3.842184e-01
## [111,] 0.212259307 0.787513027 -0.1977203788 2.277430e+00 7.118038e-01
## [112,] 3.031880181 0.978384944 3.1158129283 4.017201e-01 1.846029e+00
## [113,] 2.021304120 0.711043695 0.6006147095 1.712638e+00 5.860302e-01
## [114,] -0.193950113 2.426652681 1.6254684114 -2.152865e-01 7.236135e-01
## [115,] -0.006195416 0.042056660 -0.0876775079 1.117388e+00 8.510394e-01
## [116,] 6.274052312 2.852241425 7.2145395493 8.638740e-01 1.207930e-01
## [117,] 2.909734054 1.568562659 3.1316315035 1.586153e+00 2.651480e+00
## [118,] 0.349611415 -0.122826142 0.6038116336 1.617708e+00 2.650802e-01
## [119,] 0.301350501 0.225390626 0.7520258537 6.174621e-01 1.307688e+00
## [120,] 0.683672171 2.369810904 1.2082348233 5.985077e+00 2.187025e-01
## [121,] -0.170644043 0.067692864 0.8544550746 6.518067e-01 -1.417778e-02
## [122,] 1.803217965 -0.004518427 -0.0956339877 1.829125e+00 2.207554e-01
## [123,] 0.378366854 1.225524860 0.3325045467 1.441559e+00 6.050282e-01
## [124,] -0.116932770 0.697582615 1.3665017694 2.348174e-01 2.715066e-01
## [125,] 0.314406098 1.194277666 0.1252605108 1.639895e+00 1.000570e-01
## [126,] 0.353572551 0.689747924 1.0814108883 3.725576e-01 -4.061928e-02
## [127,] 2.092872920 0.732525345 0.6372250540 3.500514e+00 1.721104e+00
## [128,] 0.194664252 1.118415683 0.2650811848 1.191357e+00 9.206589e-01
## [129,] 1.016329456 0.093382668 0.0936779218 9.995642e-01 2.846328e-02
## [130,] 2.045072297 1.221426059 0.0529453912 7.257238e-01 6.997759e-01
## [131,] 1.010824080 -0.110932808 0.6737661254 2.778507e-01 6.900098e-01
## [132,] -0.098858526 0.825691346 1.7012124288 8.490693e+00 1.380196e+00
## [133,] 0.937010211 0.101227806 1.9823396606 1.482678e-01 1.282385e+00
## [134,] 0.381088167 1.564305843 1.3821161449 9.943813e-01 1.107715e+00
## [135,] -0.043177085 0.493383730 0.3879876511 3.033780e-01 5.329785e-01
## [136,] 0.059008050 0.364268001 0.2470499046 5.249513e-01 5.501692e-02
## [137,] 0.054934819 0.217589433 0.2605231279 6.785821e-01 6.868846e-01
## [138,] 0.149305651 0.445103933 0.8630708409 5.130507e+00 2.155018e+00
## [139,] 1.520718563 0.882305304 0.3381157173 2.067950e-01 3.891450e+00
## [140,] 0.080959545 1.175552246 2.3777817101 8.081509e-01 -1.148589e-01
## [141,] 1.806920776 0.203576039 1.5733625684 4.536221e-01 2.686134e-01
## [142,] 4.382473466 0.737566630 0.1078389204 1.473534e-01 9.146038e-01
## [143,] 5.868266716 0.507429454 0.8337869712 6.791446e+00 1.071227e+00
## [144,] 0.464143903 0.552974269 0.2773880731 6.184088e-03 6.768881e-01
## [145,] 2.865244789 2.682818215 0.2124855416 5.417706e+00 1.938148e+00
## [146,] 0.048911374 0.088014378 0.2209015904 3.714180e-01 6.642261e-01
## [147,] 0.452659374 0.944849034 3.3612358841 1.530232e+00 2.313073e-01
## [148,] 0.256425330 0.603578568 0.5460151132 -1.247610e-01 4.573426e-01
## [149,] 0.857108644 1.138942695 0.8557647081 1.037399e+00 7.906824e-01
## [150,] 0.884272701 0.708678612 0.2678214000 7.731842e-01 1.687280e+00
## [151,] 0.320530152 0.167736519 0.5769245934 2.233370e+00 8.456132e-01
## [152,] 0.723460156 0.413906191 -0.0581330570 5.541136e+00 -4.816894e-02
## [153,] 0.139144598 1.284983759 3.0405194009 1.925511e-01 9.097931e-01
## [154,] 0.918064241 -0.083106757 1.4175627032 7.367462e-01 3.442348e-01
## [155,] 0.429944088 0.923178466 0.6691776803 4.065478e-01 3.001878e+00
## [156,] 1.188022956 -0.069424106 0.3009174717 6.388348e+00 3.820727e-01
## [157,] 0.944497515 7.071635734 -0.3593790551 2.917386e-01 1.825229e+00
## [158,] 1.455335444 0.427202606 1.1232747447 1.856484e+00 1.324670e+00

```

```

## [159,] -0.257263397 1.091317923 0.3828594078 2.761452e-01 7.199881e-01
## [160,] 0.254003511 0.956096827 4.4624627108 2.700136e+00 2.767903e-01
## [161,] -0.095090325 3.207737295 1.2143715196 7.031547e-01 2.858633e-01
## [162,] 0.428685474 -0.015003364 -0.0322481658 1.322601e+00 2.414750e-01
## [163,] 0.118447375 0.556982579 1.0127714769 1.702569e+00 7.594630e-01
## [164,] 0.011400381 0.325420636 1.4159937019 8.963784e-01 4.231073e-01
## [165,] 0.852737281 0.401953889 1.8150554682 3.013686e-01 -9.381699e-02
## [166,] 1.275725337 2.900562685 2.5982857348 -1.350962e-01 4.206221e-01
## [167,] 1.032638857 2.525581543 0.2541978988 1.927641e+00 -3.422889e-01
## [168,] 4.404282195 -0.301712289 0.4986240577 2.300491e+00 1.599711e+00
## [169,] 1.610063532 2.268199964 1.2543484953 2.088995e-01 1.599142e-01
## [170,] -0.002714557 0.463505477 1.5504819907 5.827167e-01 2.881865e-01
## [171,] 1.187002444 0.756370346 0.4593186117 1.326876e-01 6.229153e-02
## [172,] 1.344989841 1.239763640 1.6612355275 4.378787e-01 1.056144e+00
## [173,] 0.141521571 0.718762185 0.1789778408 2.719720e+00 6.043536e-01
## [174,] 3.058048900 0.861321642 0.4495370345 4.875268e-01 7.867951e-01
## [175,] 0.403999124 0.571825406 0.1304638151 -1.165230e-01 6.406418e-01
## [176,] -0.271629550 2.631130161 0.3215188805 1.991597e+00 2.727950e-02
## [177,] 0.962807376 2.009137076 0.9252406016 2.571360e+00 1.147242e+00
## [178,] 1.200373990 0.713413866 -0.2572940231 3.462160e-01 1.309479e+00
## [179,] 1.038530425 2.812173038 0.7728646803 2.541876e-01 4.960483e-01
## [180,] 0.200750260 0.154301683 0.3703617657 7.099180e-01 6.483874e-01
## [181,] 0.842528849 0.724966733 1.8996893149 1.015354e-01 1.280053e-01
## [182,] 0.632499192 -0.077451570 0.8644739544 3.533236e-01 9.341193e-01
## [183,] -0.064694915 1.128058182 2.5940638621 1.102495e+00 5.989050e-01
## [184,] 0.529643611 1.723008255 0.7790362925 3.910011e-01 3.524203e-02
## [185,] 1.013631858 0.239959053 -0.0527208595 9.536391e-01 1.355556e+00
## [186,] 0.251995412 0.160350805 -0.3430654244 -1.433321e-01 -2.060617e-01
## [187,] 0.167281881 0.792661946 1.0348244172 1.746194e+00 1.233655e+00
## [188,] -0.192400328 2.708024263 0.9288050733 1.082295e+00 7.271349e-01
## [189,] 0.859030508 0.173489967 1.5940778744 6.083662e-01 1.550764e+00
## [190,] 2.659001998 2.451142084 3.4468426196 8.306638e+00 7.865053e-01
## [191,] -0.094360641 0.552842361 0.5910792273 1.894014e+00 6.640208e-01
## [192,] 0.847687303 1.757305001 2.8050288427 1.062476e+00 -2.498997e-01
## [193,] 0.324388558 1.251519294 0.3171505144 2.086443e-01 -5.566218e-03
## [194,] 0.150306508 0.886934493 0.3562529135 1.163151e-01 3.587538e-01
## [195,] 2.769645399 -0.045805539 0.0009971093 2.313294e+00 1.083201e+00
## [196,] 1.921980435 1.249317736 0.4643125203 1.965549e+00 3.710290e-01
## [197,] 3.464006666 0.094276233 0.0752488905 -4.811241e-02 1.144429e+00
## [198,] 0.867605566 0.134391021 8.0284404469 1.774225e+00 5.185953e+00
## [199,] 0.127013344 3.932520451 1.5513879215 -2.926879e-02 4.179492e-01
## [200,] 0.400895407 0.416376542 1.7052036818 5.941066e-01 1.402234e+00
## [201,] 1.636502025 1.152381119 -0.0884749364 4.764068e-01 8.658565e-01
## [202,] 0.613328362 3.374292351 1.2930959399 6.262360e-02 7.827679e-01
## [203,] 1.867878826 3.234971895 2.5659455798 8.787719e-01 1.845342e-01
## [204,] 1.347533305 1.154510461 0.1685833383 1.172123e+00 2.230484e+00
## [205,] 0.543766580 1.941565684 0.9167264661 2.594057e-01 2.313419e-01
## [206,] 2.492620481 1.172714774 -0.0127508421 -3.929750e-02 7.173691e-01
## [207,] 0.584202598 1.025972690 0.1852634751 1.041976e-01 4.080286e-01
## [208,] 0.920761979 1.264839862 3.2138701193 9.452485e-01 1.153146e+00
## [209,] 1.339113503 0.145541292 0.7551770141 7.454326e-01 2.400156e-01
## [210,] 0.007017089 0.335075596 2.4025983217 3.926599e-01 2.113729e+00
## [211,] 0.517625999 0.737599742 1.1708848774 -1.140848e-01 8.026391e-01
## [212,] 0.714303180 0.030949692 0.1759720302 3.072461e+00 4.342104e-01

```

```

## [213,] 0.998102448 1.651909809 -0.3711530148 4.065663e-01 -1.618186e-01
## [214,] 0.881387708 0.286830905 0.9305104508 3.097860e-01 -8.900840e-02
## [215,] 2.556022049 0.028583694 0.0752676284 3.067776e-01 1.580876e-01
## [216,] 0.957164806 0.806309478 1.6479426448 7.771553e-01 2.418378e+00
## [217,] -0.408283079 0.336078284 0.9391679419 6.853732e-02 1.650926e+00
## [218,] 4.111138782 1.708360061 4.1344546350 2.134546e-01 5.299147e-01
## [219,] 1.523074174 1.580243227 0.9977708888 1.617054e+00 2.003961e+00
## [220,] 0.366475095 0.914965796 3.7887970183 9.893574e-01 4.291384e-01
## [221,] 1.608906287 2.711075626 1.0825089443 2.109955e+00 1.095619e+00
## [222,] 0.143189899 1.050194173 0.3185437662 -1.343478e-01 2.393344e-01
## [223,] 0.789270665 0.148226311 0.1659272815 1.175146e+00 5.512538e-01
## [224,] 0.037741967 0.460495566 1.1461725320 1.828903e+00 6.555341e-01
## [225,] 1.056020870 0.105944501 0.8677796177 -6.860646e-02 -1.210285e-01
## [226,] 0.251424723 0.073188382 0.8430464104 8.827455e-01 5.510420e-01
## [227,] 1.319417960 5.312139530 0.3589498297 5.869544e-01 -2.410950e-02
## [228,] 1.525794008 0.371893369 0.5729239569 1.617098e+00 9.475177e-01
## [229,] 1.304330735 0.060734659 1.0051148046 1.667609e+00 -1.919889e-01
## [230,] 1.126326441 0.038156740 0.1043586948 1.448265e+00 4.649616e-01
## [231,] 0.867307058 0.716249465 2.1553483229 8.096887e-01 1.556443e+00
## [232,] -0.132245537 1.092120034 0.0270079532 2.330165e+00 2.504684e-01
## [233,] 0.628853654 1.577304005 2.9055975766 1.332950e+00 2.497012e+00
## [234,] 1.437759763 2.168250297 3.1885921621 2.146776e+00 3.992244e-01
## [235,] 0.559823875 0.228861848 0.5434818144 4.279324e-01 2.298321e-01
## [236,] 2.020744710 0.862943375 0.7137067333 1.391872e+00 2.536289e-01
## [237,] 0.314053248 0.915447006 1.8148692700 6.579595e-01 -1.871690e-01
## [238,] 0.098720777 0.490696964 2.6535314207 5.609003e-01 2.426787e+00
## [239,] 5.192053956 0.701136792 0.5895868177 1.599852e+00 1.562772e+00
## [240,] -0.327460568 0.988336903 5.7812393530 7.208116e-01 3.891323e+00
## [241,] 0.499075362 2.807499228 0.7240394405 7.864864e-01 2.627898e-01
## [242,] -0.051074221 0.236254565 0.6561040260 1.243492e+00 -3.254977e-01
## [243,] 0.328650179 4.046874319 -0.4383855359 3.280939e+00 1.852252e+00
## [244,] 0.267050339 1.387171701 1.0365657052 4.413702e+00 2.662875e+00
## [245,] 2.156757347 1.325792533 2.0083985742 3.228006e+00 1.512438e-01
## [246,] 1.217571920 1.385976450 1.1277940379 5.095512e-02 2.274296e-03
## [247,] 0.968261461 -0.029672739 0.5572030073 2.821527e+00 1.149706e+00
## [248,] 1.003623800 0.160319584 0.8415700403 2.708842e-01 2.063465e-01
## [249,] 0.565959299 2.157477958 -0.1146754976 8.828126e-01 1.474936e+00
## [250,] 0.906440931 -0.110102762 1.3422832827 -4.710974e-03 9.070234e-01
## [251,] 0.287753303 -0.049422764 1.2773995156 3.151044e-01 1.224758e+00
## [252,] -0.116280068 -0.120325903 1.1441687361 3.696109e-01 4.395998e-01
## [253,] 0.069579464 0.517343409 0.2575750471 1.030174e+00 -1.543282e-01
## [254,] 0.758867148 0.579950480 1.0251992281 7.998330e-01 1.271441e+00
## [255,] 0.533269846 1.265740080 1.6516922278 2.445990e+00 -2.743935e-01
## [256,] -0.051247259 1.163777435 -0.0606100253 1.768103e+00 1.682900e+00
## [257,] -0.036286943 1.236838357 0.4032364642 1.134856e+00 6.496619e-01
## [258,] 0.089641819 1.434828170 0.8085380919 2.711460e-01 4.825806e-01
## [259,] 0.339587079 0.164359140 0.2553427250 1.783522e-01 4.095437e-01
## [260,] 0.432747180 1.273497358 2.5977386337 -1.109465e-01 1.055203e-01
## [261,] 0.073202701 0.144086563 3.3404222040 5.060495e-01 4.792126e-01
## [262,] -0.100292120 2.044961628 0.2914306796 1.846782e-02 1.142489e+00
## [263,] 0.865122453 0.012440304 -0.0001088824 1.156132e+00 4.397513e-01
## [264,] 0.106309899 0.160755591 0.8114638365 5.801029e-01 6.536679e-01
## [265,] 1.161012202 0.289687992 0.4386633757 4.056285e-01 7.157311e-01
## [266,] -0.033197746 0.098653518 0.0846828904 1.710494e-01 1.978035e+00

```

```

## [267,] 0.018201672 -0.131110456 1.8928840422 4.365937e+00 4.786996e-01
## [268,] 0.731862792  0.982976677 0.1434690801 3.376649e+00 5.749012e-01
## [269,] 1.261159815  0.191632280 3.3175643015 8.308962e-01 8.395534e-01
## [270,] 0.599809623  -0.127775930 0.8569787727 1.830880e+00 1.045616e+00
## [271,] 0.073794169  0.826141196 0.1813644424 6.604794e-01 4.451729e-01
## [272,] 2.761127828  -0.338186994 1.1913332757 1.534077e+00 1.008913e+00
## [273,] 0.401966338  1.326638518 1.3024740685 1.402794e+00 8.773460e-01
## [274,] 0.528607296  -0.170921163 0.1964581310 1.657721e+00 7.031630e-02
## [275,] 2.349023419  0.685199651 0.0039131075 6.125712e-01 2.119014e-01
## [276,] 0.311359182  0.383539264 0.6208473645 3.721769e+00 4.278003e-01
## [277,] 0.785767856  -0.298716291 0.3669438371 1.558835e+00 8.173094e-01
## [278,] 0.616635963  3.391001024 1.5256675817 4.723593e+00 3.641984e+00
## [279,] 0.075216075  0.847121046 0.1717586739 6.486800e-01 3.363375e+00
## [280,] 0.021002042  1.033731199 3.1342789500 6.862063e-02 5.487224e-01
## [281,] 1.880006115  1.839380633 0.7684058010 1.607438e+00 1.951682e-01
## [282,] 0.435500283  0.704041555 0.2954838993 4.696252e-01 2.351070e+00
## [283,] 0.447378129  1.566387441 0.5913952888 3.310180e-01 7.350678e-01
## [284,] 1.176593954  -0.024945811 -0.1300101462 2.467434e+00 7.246359e-01
## [285,] -0.015641752  1.274068764 1.5783212241 -2.902664e-01 1.363560e+00
## [286,] 0.678714193  1.858650429 1.7963346271 2.625993e+00 3.101523e+00
## [287,] 1.836814519  0.161703586 0.6040052761 2.067167e+00 -3.528157e-01
## [288,] 2.195115414  0.291590962 0.3999129615 5.778767e+00 2.546760e+00
## [289,] 0.227501700  0.058467722 1.6057156546 1.550352e+00 1.684514e+00
## [290,] 2.246599331  0.464787109 -0.3996719276 1.536691e+00 5.079510e+00
## [291,] 0.571114061  0.712341778 0.4717458679 -1.438357e-02 3.327337e-01
## [292,] 0.256118280  0.830446090 0.2560548312 5.298745e-01 2.187441e+00
## [293,] -0.109269558  0.202686877 1.6872717924 2.801263e+00 2.149974e-01
## [294,] 3.741273964  1.691705181 0.5242859456 7.611970e-01 1.522914e+00
## [295,] 0.646324573  2.144314808 3.1479364842 6.224941e-01 1.370037e+00
## [296,] 0.809853301  0.333110693 0.3208274476 2.041032e+00 7.165688e-02
## [297,] 1.252495801  3.080217963 5.2807682874 7.206363e-01 -3.755158e-02
## [298,] 0.427666285  1.778004995 1.1140468528 1.406937e+00 5.921959e-01
## [299,] 0.476275007  0.222392805 0.1474634760 7.290237e-01 8.170514e-01
## [300,] 0.908322002  0.119586021 0.0428898858 2.208329e+00 4.978894e-01
## [301,] 1.128313036 -0.432887080 0.2051972055 4.365638e-01 -3.025047e-01
## [302,] 1.112495253  1.355590686 1.2893599826 -4.125240e-01 -1.349095e-01
## [303,] 1.452832117 -0.082446126 3.8415196968 1.116087e+00 2.256324e+00
## [304,] 0.803631770  1.415688469 0.8438504070 8.178050e-01 1.337201e+00
## [305,] 0.346105654  1.802646762 0.4141637377 1.300455e+00 -1.285101e-01
## [306,] 4.063431145  3.187643891 0.8223530473 1.305896e+00 1.722398e+00
## [307,] -0.186351858  0.924927827 1.0723891387 3.374927e+00 2.097740e+00
## [308,] 0.533784190  0.170033846 0.8255734238 6.427736e-01 6.093501e-01
## [309,] -0.185107825  1.876703640 1.6654278433 3.272372e-02 1.786648e+00
## [310,] 0.199101211  0.186289342 0.1815895071 8.144805e-01 2.203732e-01
## [311,] 0.549864952  0.723025097 -0.1266675722 2.310612e+00 5.170747e-02
## [312,] 1.513639216  0.706314187 0.6716760474 -1.983685e-01 1.357839e-01
## [313,] 0.546783181 -0.008123084 0.9996505491 1.105478e-01 1.535366e+00
## [314,] 0.676932440  0.942124896 1.3238200313 1.491792e+00 6.579841e-01
## [315,] 0.437042408  0.182182461 0.4605472882 1.072001e+00 -5.187184e-02
## [316,] 0.024009243  0.357301128 1.4436038460 6.900603e-01 -3.012768e-01
## [317,] 1.009871087  1.082163666 -0.1566138008 2.271264e+00 6.867904e+00
## [318,] 0.529563001 -0.036902354 0.1058562556 2.550939e+00 2.841904e+00
## [319,] 2.378383082  5.181053172 1.4376810183 5.032260e+00 2.203390e+00
## [320,] 2.410495508  2.872683353 3.5515418902 3.541866e-01 5.287914e-01

```

```

## [321,] 0.635419182 -0.030335926 0.7390238703 5.678200e-01 1.590541e+00
## [322,] 0.847246426 -0.086713139 0.7120567177 1.632682e-01 1.567956e+00
## [323,] 1.764191731 1.612676967 1.9406492248 -2.157899e-01 4.363094e-01
## [324,] 0.733173720 -0.378707985 2.9869337597 5.337931e-01 -2.065264e-01
## [325,] 6.205578858 0.784435109 1.6001020354 6.504509e-02 9.507170e-01
## [326,] 0.954332744 0.927589501 0.8951913597 5.586745e-01 2.249608e-01
## [327,] 2.066138125 0.464169772 0.9416784023 1.154791e+00 2.474563e+00
## [328,] 0.691257027 2.167751373 0.7506412745 1.201852e+00 3.531816e-01
## [329,] 0.277603663 5.964865015 0.9217121757 1.821552e+00 2.019494e-01
## [330,] 0.821640428 0.502019294 2.8819880666 2.343815e+00 3.184656e-01
## [331,] 0.294755940 0.538749449 0.4934601776 1.298195e+00 3.532920e-01
## [332,] 0.963567228 0.062882932 0.4691816540 2.408197e-01 2.109345e+00
## [333,] 0.893232803 -0.007921319 2.9699558630 2.688788e+00 8.061202e-01
## [334,] 1.333937552 0.091028610 0.6560559837 1.101084e+00 1.281665e+00
## [335,] -0.236951663 1.602380952 0.1489744888 1.266369e+00 3.337955e+00
## [336,] 0.569764775 1.210875896 0.7371836076 1.132296e+00 1.370899e-01
## [337,] 1.543363662 1.381797859 0.9746783312 6.725532e-01 -1.252649e-01
## [338,] 2.894026204 0.840651768 1.2679066483 2.681980e-01 7.606892e-01
## [339,] 4.026266902 0.239745753 -0.5471594963 2.383828e-01 1.035019e+00
## [340,] 1.202488783 0.246183867 0.4846389670 1.577067e-02 2.554774e-02
## [341,] 0.415384631 0.083155552 0.4660661878 3.221394e+00 6.643002e-01
## [342,] 2.427549017 0.744310795 0.8445259182 1.782436e-01 1.417630e+00
## [343,] 1.467060493 1.128900018 0.0698138976 4.198777e-01 2.806421e+00
## [344,] 2.584418380 1.266992909 1.1426227289 2.726846e+00 5.605763e+00
## [345,] 1.278812567 0.120982749 0.9998805584 1.393680e-01 2.395620e+00
## [346,] 1.645722391 0.331991549 0.3113808330 1.697010e+00 -9.951245e-03
## [347,] 2.566042628 1.176499368 0.4859908442 -4.202953e-02 -6.852512e-02
## [348,] 3.314562073 2.960900697 1.2565476398 2.654390e+00 2.293563e+00
## [349,] 0.410673154 0.274134147 1.2025958656 9.483126e-01 8.449065e-01
## [350,] 0.316736785 1.031690197 3.6010924521 1.267968e-01 1.501526e-01
## [351,] 0.712048242 2.114741560 0.9716684048 1.704361e+00 1.294774e+00
## [352,] 0.465752069 0.239359264 0.1689217417 3.992373e-02 6.115053e-01
## [353,] 1.018658853 1.166262185 0.8373256448 1.357443e+00 3.451549e-01
## [354,] 0.430868151 8.196543530 1.5390345487 1.035342e+00 4.078968e-01
## [355,] 3.936533557 -0.167644156 0.9349045113 1.256041e+00 -2.097260e-01
## [356,] 2.267051512 0.217830510 0.7779857001 1.002167e-01 2.952231e+00
## [357,] 2.023407347 1.251569055 0.0530012315 8.910475e-01 2.231024e+00
## [358,] -0.274692949 0.644019584 0.5597053494 2.982320e-01 2.475239e+00
## [359,] 0.067549988 1.570535431 1.2125322975 1.230954e+00 -2.018560e-01
## [360,] 0.075710914 1.414220906 -0.1170594299 7.230517e-01 8.225822e-01
## [361,] 0.342834959 0.426058495 0.5037877752 1.026117e+00 3.010458e+00
## [362,] 0.545647783 0.273099173 0.1131273276 1.462854e+00 7.284991e-01
## [363,] 2.235221705 0.463024596 1.8552661442 4.861349e-01 1.268726e+00
## [364,] 0.179055593 0.418158010 0.0656631020 9.171757e-01 8.998310e-02
## [365,] -0.097418407 2.573239022 1.5902329698 -1.007498e-01 1.025360e+00
## [366,] 0.424143398 3.927156016 2.3680203233 1.201636e-01 3.675635e+00
## [367,] 1.023943858 0.480653231 0.4065027201 9.724830e-01 6.697056e-03
## [368,] 3.079478036 0.421620633 1.1099438514 2.626781e-01 8.323148e-01
## [369,] 0.512187049 0.389276486 0.0294735873 3.122411e+00 1.899558e+00
## [370,] 1.277710215 6.494856029 5.1856361948 9.045056e-01 1.339895e+00
## [371,] 1.235143471 0.480659266 0.6593326247 -7.588698e-02 3.196936e-01
## [372,] 0.598850357 0.071516390 2.0468232995 2.574278e+00 1.802758e+00
## [373,] 0.089059739 0.707927061 0.2328320166 8.339237e-02 8.660532e-01
## [374,] 1.226666715 4.052007060 2.9955985314 9.560355e-01 1.944638e-01

```

```

## [375,] -0.018600408 1.276347719 1.1124057581 6.266407e-01 5.991890e-01
## [376,] 0.403836259 0.061274054 0.6399295142 1.249028e+00 1.259571e+00
## [377,] 0.543422426 0.225400488 1.8803297409 3.185689e-01 -3.215754e-01
## [378,] 0.702201609 0.935197725 0.1155858947 1.784581e+00 4.572910e-01
## [379,] 0.273407385 0.137849387 1.1379010401 2.314933e-01 -5.356805e-02
## [380,] 1.321562875 1.011608103 2.3448485550 1.331754e-01 6.391357e+00
## [381,] -0.128889680 1.810052879 -0.0504641966 1.618306e+00 5.795252e-01
## [382,] 0.194293140 0.097495985 0.3934409683 1.531979e+00 5.130737e-01
## [383,] 0.411751585 2.403942764 0.7490241556 8.017407e-01 6.466500e-01
## [384,] -0.119194989 -0.039529925 -0.0249132425 1.991141e+00 3.827641e-01
## [385,] 1.334336762 1.837450207 2.0607378611 1.951756e+00 -4.645451e-02
## [386,] 1.142665662 -0.105633225 3.4303300884 8.562451e-01 2.249760e-01
## [387,] 0.903081297 0.753507237 0.5610594448 9.326308e-02 4.417305e-01
## [388,] 0.978709318 0.212035369 3.9328899634 -7.431409e-02 -1.522450e-02
## [389,] -0.136963614 1.707515704 1.2966241801 5.459501e-01 5.838256e-01
## [390,] 0.505806695 1.448623800 1.3683963146 6.671620e-01 1.574140e-01
## [391,] 0.095096964 0.736323940 0.6346625685 7.868819e-01 1.793301e+00
## [392,] 0.148595508 0.466635784 0.5164939359 1.915761e+00 1.222844e+00
## [393,] -0.112870637 0.194081667 2.7082575080 2.312195e-01 1.641838e+00
## [394,] 0.469829191 0.691096578 -0.0494460815 3.485918e-01 -1.411575e-01
## [395,] 0.133804387 -0.087937266 0.0217948926 1.694719e-01 5.000865e-01
## [396,] 0.396742499 -0.135213953 0.4390833411 1.482502e+00 2.435070e+00
## [397,] 1.271484463 3.290150197 0.1329315547 8.415800e-01 1.016733e+00
## [398,] 0.779239855 0.986110525 0.2627727386 6.521381e-01 4.827016e-01
## [399,] 1.022792282 1.422318447 0.9240256956 8.135927e-01 -2.150383e-01
## [400,] 4.443141828 0.201398584 0.6641428246 7.975242e-01 5.501096e-01
## [401,] 0.652092477 2.608741882 0.2248629007 -3.464493e-02 1.327962e+00
## [402,] -0.110897530 0.845269620 0.5478401207 1.123179e+00 -2.515422e-02
## [403,] -0.157136658 0.122859458 -0.1047495553 5.918637e-01 1.275972e+00
## [404,] 1.712881460 1.960420125 0.3836399613 4.486082e-01 5.855972e-01
## [405,] 0.369591847 0.121093707 1.6137425680 8.633509e-01 5.963663e-01
## [406,] 0.117314029 1.836269872 1.4102849158 1.423141e+00 -2.468144e-01
## [407,] 0.7318180574 3.526732444 0.3470516472 3.157887e+00 2.365654e-01
## [408,] -0.052557483 0.450051906 0.7196969378 7.081652e-01 5.562441e-01
## [409,] 0.703844883 0.330337554 -0.0079167661 1.125335e-01 1.259466e+00
## [410,] 0.613888388 0.789852194 0.9892680064 1.119055e+00 1.404415e+00
## [411,] 0.245336315 0.395682846 0.0822919309 1.295623e+00 -7.297447e-02
## [412,] -0.088349140 1.066459592 1.2113924440 3.607687e+00 2.752585e-01
## [413,] 1.207198301 -0.134277605 -0.2253919294 5.866319e-01 5.366484e-01
## [414,] 0.366496109 0.442594810 -0.3560231056 -1.331825e-01 1.205004e+00
## [415,] 0.193442129 0.424708267 1.1596287967 4.132545e-01 1.793615e+00
## [416,] 1.524692799 -0.321843407 0.7784938543 9.369692e-01 2.263874e+00
## [417,] 1.232282916 0.153632560 -0.0966029074 2.398013e-01 4.101530e-01
## [418,] 0.983883773 0.253419908 0.0989536262 4.979179e-01 1.131048e-01
## [419,] -0.005069300 0.235540784 0.2292169316 -3.103323e-01 3.326332e-01
## [420,] -0.050604527 1.669631308 0.4910416964 9.973701e-01 8.941484e-01
## [421,] 0.345076200 0.898619454 0.2067909852 5.532366e-01 4.030101e+00
## [422,] 2.447959192 3.674324966 2.2758524538 4.663154e+00 3.016631e-01
## [423,] 1.269551923 -0.051862565 0.1310161490 2.431060e-01 2.442062e-01
## [424,] 1.359587003 0.236766013 1.2143937424 -3.050799e-01 9.884466e-01
## [425,] 1.958405663 1.946402314 0.1813415451 1.708607e+00 8.195136e-01
## [426,] -0.057994470 2.359432365 1.4320621594 2.689114e-01 6.932857e+00
## [427,] 0.172959841 0.953090710 0.3523774190 6.105119e-01 2.496311e-01
## [428,] 0.487038980 0.059763020 0.7994529736 1.431563e-01 9.043550e-01

```

```

## [429,] 1.219257427 0.485630782 2.1050741713 7.124780e-01 1.750369e+00
## [430,] 2.085771962 2.132376749 3.3395768328 1.347214e+00 -4.484099e-01
## [431,] 0.491965448 0.039212814 -0.1179964196 5.335625e-01 -6.116331e-02
## [432,] 0.310393744 0.495513321 4.2395634902 9.245604e-02 7.382116e-01
## [433,] 3.008523539 1.542085203 1.5712001889 -2.203137e-01 -2.616317e-01
## [434,] 0.805608882 1.113164608 2.2024547807 6.986739e-01 2.630968e+00
## [435,] 1.292336989 0.147880433 0.5720282088 1.807619e+00 2.643089e-01
## [436,] 0.992031362 0.718504928 0.5738201547 2.674554e-01 1.076681e+00
## [437,] 1.021902712 0.907369740 0.0205020253 4.314460e-01 -1.278572e-02
## [438,] 0.027086142 1.713721259 2.2462177543 2.717570e+00 1.598383e+00
## [439,] 0.368234705 1.071527482 0.3411390212 1.082708e-01 7.102563e-01
## [440,] 0.281228739 0.497243024 0.7116363849 3.080066e-01 -8.998913e-02
## [441,] 1.178852684 0.639884754 0.1581592286 3.110607e+00 1.772187e+00
## [442,] 2.135543453 0.348146405 0.8892577831 3.336440e+00 -2.149208e-01
## [443,] 1.850374044 -0.017119545 1.2473230522 8.734548e-01 5.802122e-01
## [444,] -0.095472433 -0.093785322 0.5424969196 4.378298e-01 6.597646e-01
## [445,] 0.098663174 1.638759284 0.2423543568 -1.256048e-02 1.204682e+00
## [446,] 0.817743181 -0.139548431 5.6916920253 -2.342011e-01 -7.197105e-02
## [447,] 7.277433542 1.060657337 0.9117726863 2.951977e+00 3.475916e-01
## [448,] 0.886736198 1.970171844 -0.2330812820 9.511662e-01 1.777880e+00
## [449,] 0.030687361 0.175171295 0.2293718771 -1.816059e-01 3.793067e-01
## [450,] 0.364909004 -0.086206688 2.5187638191 1.577069e+00 1.964086e-01
## [451,] 2.055797525 0.832265590 1.4891982395 6.741773e+00 -4.851594e-01
## [452,] 2.471950762 0.073715690 1.1624329929 1.862790e-01 5.914141e-01
## [453,] 4.493852460 0.743194052 0.1445797564 7.036511e-01 5.880811e-01
## [454,] 0.609514959 2.824177453 1.0297657888 6.703766e-01 3.031494e-01
## [455,] 1.373832921 0.345719141 0.3952299463 8.579355e-02 4.130272e-01
## [456,] -0.141076548 2.536018315 2.6842144712 1.232668e+00 5.613847e-01
## [457,] 0.312983646 0.117508361 4.2839496565 1.515145e+00 7.253462e-01
## [458,] -0.062628544 0.011479252 0.6641005037 1.414812e+00 2.058442e+00
## [459,] 0.916091662 1.223019506 0.3488302044 3.799727e-01 -2.010282e-01
## [460,] 0.314569186 0.516246197 0.3303894690 6.900486e-01 7.444943e-01
## [461,] -0.304750606 1.645359863 3.3531122683 9.501802e-01 2.423608e-01
## [462,] 0.227995513 0.422322382 0.5773161638 7.242191e-01 3.170336e-01
## [463,] 0.538227293 0.250234761 0.7234921110 3.146598e+00 1.675872e+00
## [464,] 1.773876608 0.244470303 1.2708775355 7.527514e-01 9.429232e-01
## [465,] 0.094341860 0.509001455 0.0583496112 7.151475e-01 8.399188e-01
## [466,] 0.740965446 0.152046004 1.4867032758 2.570790e-01 1.809602e+00
## [467,] 0.319272246 1.906356336 0.1628597755 9.021987e-01 -7.520034e-02
## [468,] 0.963842605 1.091243505 1.3950362831 5.555235e+00 2.346410e+00
## [469,] 1.020628308 1.840665159 1.2553122956 1.614000e+00 5.576416e-01
## [470,] -0.373553145 3.374337414 5.2039401345 3.012707e+00 1.064586e+00
## [471,] 0.994643840 0.672945855 0.8064537922 1.011053e-01 7.553475e-01
## [472,] 3.792609187 1.553855760 4.0962254804 8.742499e-01 1.166440e-02
## [473,] 2.784349325 6.927080181 1.3466666526 4.213817e+00 -3.401510e-03
## [474,] 1.607027786 0.258574401 2.2858338329 2.638275e+00 1.286538e+00
## [475,] 0.483396768 1.074478941 1.5046927836 1.372999e+00 8.625299e-01
## [476,] 1.011952143 1.301444588 0.5833719094 2.309508e+00 2.695332e-01
## [477,] 0.846884897 0.174303009 0.6513016959 1.727663e+00 1.401162e+00
## [478,] 0.411569118 1.719643849 1.2200202652 -2.116958e-01 3.528945e-01
## [479,] 1.313834198 0.273184938 0.3861305014 3.245565e-01 7.222749e-01
## [480,] 3.692396150 0.487729360 0.4965180231 6.399971e-02 3.305926e+00
## [481,] 0.260610621 0.984579750 0.9403236814 8.417335e-01 2.405183e+00
## [482,] 2.436845535 0.097112866 1.4031593087 3.100076e-02 7.725652e-02

```

```

## [483,] 1.503697661 -0.127764925 -0.0143893406 2.225262e+00 -1.513230e-01
## [484,] 0.187800164  0.301156211  0.7532842345 1.360245e+00  4.795664e-01
## [485,] 0.250391578  0.165352362  0.2392422159 3.710009e-01  7.387819e-01
## [486,] 0.742027286 -0.027127400  1.1513977373 1.220884e-01  7.730330e-01
## [487,] 1.911457936  0.041053034  0.4132058902 1.394895e+00  7.478512e+00
## [488,] -0.049270937  0.778665006  1.0308579186 2.142735e-01 -2.348354e-01
## [489,] 0.438411254  0.546580122  0.6371794239 2.926873e-01  7.143183e-01
## [490,] 2.767356755  3.646146316  0.1789577832 2.276456e+00  2.136506e+00
## [491,] 0.067088669  1.050516815  0.4074940336 2.038441e+00  1.282464e+00
## [492,] 4.661991496  1.297929449  2.5502363834 8.822472e-01  3.963699e+00
## [493,] 0.428535268  1.315454358  0.7893663217 1.936649e-01  9.347013e-01
## [494,] 0.435318383  1.590387289  2.4157561396 9.400117e-02 -2.546724e-02
## [495,] 4.880467599  1.003621754  0.2930516540 1.181976e+00  1.126044e+00
## [496,] 0.501029737  1.266310005 -0.0409004556 3.827657e-01  1.550623e+00
## [497,] 2.963081632  0.878575989  3.7031447033 3.939618e+00  6.722814e-01
## [498,] 0.397183193  1.006386642  0.7829811986 1.996433e+00  1.933798e-01
## [499,] 0.086398174  1.346873448  0.3888354940 1.400557e+00  2.911298e+00
## [500,] 2.614554791  1.255337330  0.4248194757 1.616825e+00  1.306216e+00
## [501,] 3.493877708  2.372817027  0.4963331103 1.933507e+00  4.873380e+00
## [502,] 0.853422570  0.792550251  0.3394849150 1.763369e+00  2.675262e-01
## [503,] 1.821052675  3.330112312  4.7527101895 5.555175e-01  1.848756e+00
## [504,] 2.924371697 -0.027823233 -0.1227665575 6.960492e+00  8.176206e-02
## [505,] 0.041693594 -0.003102077  0.4365323687 -1.539299e-01  1.221079e-01
## [506,] 0.575800210  0.298614310  0.3075259603 1.967495e-01  9.859526e-01
## [507,] -0.076345488  2.376939609  4.2590972133 3.136393e+00 -8.091622e-02
## [508,] 4.329414579  1.116569381 -0.1284794881 1.481892e+00  4.096757e-01
## [509,] 0.627955577  0.185900465  0.6107748702 1.169493e-01  1.430627e+00
## [510,] 1.290906158 -0.026030501  0.3038791472 7.006685e-01  1.839366e-01
## [511,] 0.403188780 -0.300820938  0.2506319057 8.590870e-01  1.297715e+00
## [512,] 0.355118361  0.009096201  1.3043650603 1.025103e-01  1.689901e+00
## [513,] 1.231066326  0.256187745  1.1898732054 1.206162e+00  7.401150e-01
## [514,] -0.187001539  0.035985329  0.2986700968 7.447778e-01  1.928722e+00
## [515,] 3.381529789  0.236688394  1.0117584856 8.576153e-01  5.202680e-01
## [516,] 0.744973996  1.258661940  1.2706314371 2.902684e-01  3.213605e+00
## [517,] 1.210282992  2.319506706  1.0064895412 7.737054e-01  4.756965e-01
## [518,] 1.220027875  0.268592664  0.7323266138 5.339209e-01  2.100951e+00
## [519,] -0.022877405  1.254914807  2.2327746062 5.766478e-01  3.762046e+00
## [520,] 2.444119827  2.351902832  2.9116446380 1.055859e+00  4.622851e-01
## [521,] 0.128602358  0.571813078  1.3792380008 2.747584e-01  3.674928e-01
## [522,] 2.114700196 -0.016982243  0.1370690542 1.398934e+00 -1.292312e-01
## [523,] 1.057245287  0.197572400  0.9761885527 1.311737e-01  5.583318e-01
## [524,] 0.420901453  0.363625362  0.0736783284 -1.805116e-01  3.515782e-01
## [525,] 0.454764173  0.778487560  3.8252570092 1.141658e+00  1.369546e+00
## [526,] 0.215497210  1.273828889  1.4556205906 3.490791e-01  8.564492e-01
## [527,] 3.152138537  0.361313039  0.5664483502 1.200206e-01  1.069021e+00
## [528,] 1.639025314  0.895353739  0.4455400943 1.620809e+00 -1.415531e-01
## [529,] 0.985860396  0.342458403  0.4486085333 2.191203e+00  4.603011e-01
## [530,] 0.517778136  1.094137305 -0.1280876861 5.623103e-01  1.839016e+00
## [531,] -0.103223085  6.089699336 -0.0485592420 2.038963e+00  1.387682e+00
## [532,] 0.440209739  1.030100521  0.4540260952 9.752489e-01  4.446630e-01
## [533,] 0.448209881 -0.041530009 -0.0254310381 1.694418e-01  1.856753e+00
## [534,] 2.010539133  0.355955049  6.0996240973 7.102405e-02  4.218887e-02
## [535,] 1.943710781  0.283632857  0.5170072615 4.364057e-01  2.411952e+00
## [536,] 2.029696514  2.142407396 -0.1211177913 1.162742e+00  6.014724e-01

```

```

## [537,] 3.017706637 0.816545567 0.6996138891 5.937640e-01 4.892309e-01
## [538,] 0.460577478 0.355505735 0.4771548034 1.069364e+00 2.573680e-01
## [539,] 2.228770471 0.467636699 0.8033663280 9.923489e-01 2.761209e-01
## [540,] 0.351601643 0.404659815 4.1872291675 1.005640e+00 -2.744656e-01
## [541,] 2.956676895 1.463332851 0.4304157679 3.761048e-01 2.201569e-01
## [542,] 0.889691720 1.076695222 0.6127890564 9.043484e-01 1.279734e+00
## [543,] -0.159548119 0.484766413 2.3611740143 -3.754026e-01 1.993287e-01
## [544,] -0.115676348 2.555555922 1.7461820082 1.477190e+00 5.949860e-02
## [545,] 0.264556270 0.640327235 4.4947154589 3.236524e+00 6.976643e-01
## [546,] 0.212570338 0.293730289 0.2534456115 6.046549e-01 8.680691e-02
## [547,] 0.252073038 0.695012592 0.0836277011 8.281647e-01 2.893202e+00
## [548,] 0.465992971 0.342763323 0.9472720385 5.844212e-02 1.410345e+00
## [549,] 3.636523899 0.222705320 0.6405890168 6.449171e-01 2.860564e+00
## [550,] 1.890900053 1.312218154 0.2030786895 -1.831472e-01 8.939279e-01
## [551,] 0.133039232 2.290410252 0.0213242948 1.673508e+00 6.851629e-01
## [552,] 1.154109672 -0.143778938 1.5563735762 -3.746276e-01 -3.647887e-01
## [553,] 1.054870595 0.099828969 1.3694104922 2.433812e-01 1.213645e+00
## [554,] 1.747551835 0.113710923 0.2526737367 1.095559e+00 8.066326e-01
## [555,] 0.127344379 0.824457199 0.5295503855 1.772446e+00 4.547623e-01
## [556,] 1.309706000 2.114016266 3.3488132014 1.439727e+00 6.706287e-01
## [557,] 1.721520769 1.555367526 0.2804946411 7.025586e-02 1.694897e+00
## [558,] 0.104773206 2.999357710 0.1004851012 -8.884113e-02 5.982228e-01
## [559,] 1.385209135 1.329254127 0.5626070168 1.662909e-01 1.835831e-01
## [560,] -0.039778152 0.395364980 0.3490522134 3.937063e+00 -1.755903e-01
## [561,] 1.785563461 1.350500612 0.4680344701 4.393150e-01 2.704543e-01
## [562,] -0.226215109 1.501696113 0.0760889444 9.930932e-01 2.636595e-01
## [563,] -0.403821090 0.508618674 0.9427430533 4.580655e-01 1.588739e+00
## [564,] 1.628691739 -0.224072810 0.3765351123 1.430601e+00 -6.805385e-02
## [565,] 2.623636194 0.928974754 1.6284602601 6.223015e+00 5.201248e-01
## [566,] 0.860331516 0.352309053 1.0618430835 2.109539e-01 1.775681e+00
## [567,] 0.311212540 0.824244972 1.1249821690 4.462936e-01 -1.009207e-01
## [568,] 1.441038887 0.593947964 0.2798794042 -1.267126e-01 1.142913e-01
## [569,] 2.459693397 0.452284792 4.1983977424 3.851550e-01 -3.006674e-01
## [570,] -0.046048798 0.204178659 0.1445550473 3.866933e-01 1.799827e-01
## [571,] -0.362351564 2.577616102 1.0612678814 2.561471e+00 1.663382e-01
## [572,] 2.414827274 0.305348302 0.5981484045 -1.305355e-01 3.216930e+00
## [573,] 2.160988497 1.812033092 0.2989829514 3.251799e+00 -1.187516e-01
## [574,] 0.506356360 0.367841600 0.8794365982 1.372097e+00 6.956246e-01
## [575,] 0.203373853 0.983409271 1.4913360038 3.140436e-01 1.252091e+00
## [576,] 0.619488899 -0.130881622 0.2227952440 3.632365e-01 4.002911e-01
## [577,] 1.256066996 0.061340877 0.2781076987 1.937808e-01 7.640451e-01
## [578,] 1.213863536 0.246294564 1.2656302107 4.791310e-01 1.907460e+00
## [579,] 0.548778336 0.278646997 0.9961565422 1.178775e+00 1.375386e+00
## [580,] 0.434355445 1.653367688 0.0929089846 -1.125781e-01 1.211004e+00
## [581,] 3.454297290 0.742730043 2.0875280515 6.436553e-01 1.921594e+00
## [582,] 1.777894223 -0.159474268 0.1761456241 2.402710e-01 1.116863e+00
## [583,] 1.786524251 -0.506607241 3.1424874150 9.225736e-01 9.950834e-01
## [584,] 1.468151240 0.510079844 0.4762508489 -5.270652e-02 3.061439e-01
## [585,] 1.418145945 3.437416573 -0.4074678621 2.281578e+00 -2.271408e-01
## [586,] 3.116953280 2.205373114 -0.0745808195 1.054220e+00 9.541928e-01
## [587,] 2.466028771 0.207337122 3.7506369185 3.104045e+00 5.604114e+00
## [588,] 1.022932844 1.091294697 3.6737107496 2.639546e+00 4.204619e+00
## [589,] 1.515217212 0.337923088 0.8727153401 -2.606943e-03 5.627008e+00
## [590,] 1.975116970 0.508029006 0.4358446747 2.822792e-01 2.161341e+00

```

```

## [591,] 5.438400639 2.468752769 2.2581276875 2.135066e-01 6.115914e-01
## [592,] 0.326329581 0.728308006 0.8611608911 3.325241e-01 1.764153e+00
## [593,] 2.335341916 4.856591972 6.6871624772 1.215057e+00 4.861132e+00
## [594,] -0.188164397 0.683245552 0.0840740648 1.151895e+00 3.152521e+00
## [595,] 2.065247435 0.613820642 0.8433088887 1.106401e-01 2.621829e-01
## [596,] -0.315438653 0.444401166 0.3901101418 2.676290e+00 2.773048e-01
## [597,] 1.216982041 -0.247335070 1.0757298485 4.263100e-01 1.931247e-01
## [598,] 0.373390508 4.688587827 2.9309406199 5.193912e-01 4.358254e+00
## [599,] 0.587635142 0.061872876 0.8090641881 3.275668e+00 5.040135e-01
## [600,] 0.113349179 0.038179953 0.0654675893 5.024363e-01 1.198675e+00
## [601,] 0.480562227 -0.036378157 0.1024482220 2.738116e+00 3.234612e-01
## [602,] 0.446625028 1.831383697 1.0537056998 4.154114e+00 1.893866e+00
## [603,] 0.546886532 0.764605873 2.9511213272 1.321113e+00 2.477987e-01
## [604,] -0.310758845 2.003044759 0.1242611891 3.886286e-01 8.171282e-01
## [605,] 2.591448249 0.461649446 3.1929573704 5.302293e-01 2.671918e+00
## [606,] 0.383016927 0.119516766 0.7988392110 3.317880e+00 5.363377e-01
## [607,] 0.419314039 1.875177771 0.6125175749 1.104824e+00 1.525217e+00
## [608,] 0.342259206 -0.145763207 0.3738127914 5.875959e-01 2.573224e+00
## [609,] 7.953007913 0.208438041 5.0647486971 -5.281096e-01 1.011336e-01
## [610,] 2.908632428 -0.249846429 3.2828611438 1.600417e+00 2.858350e-01
## [611,] 0.778197024 2.064769290 0.9649830026 -2.055709e-02 2.274319e+00
## [612,] 2.849574703 0.107676987 4.4836966153 3.883278e+00 1.312690e+00
## [613,] 3.883024288 1.293074543 4.4542418330 1.552250e+00 1.419162e-01
## [614,] 1.487850885 0.304999463 0.8718535404 4.399654e-01 -5.098649e-02
## [615,] 0.345982954 0.590442110 0.2927485957 6.690945e-01 9.466018e-01
## [616,] 0.667247200 2.035409549 2.2170101203 8.946760e-01 6.456868e-01
## [617,] 1.231906530 0.304079645 0.8994149207 1.647303e+00 8.649104e-01
## [618,] 0.470597667 1.436265629 0.0338840078 4.712258e-01 2.069273e+00
## [619,] 2.711800639 -0.079762654 0.5697021392 1.077598e+00 9.861567e-01
## [620,] 0.277652255 0.021514697 0.6883271131 3.841849e-01 1.023390e+00
## [621,] 1.089221302 0.304952861 2.4515604580 2.114548e-01 8.422163e-01
## [622,] 0.324828194 -0.022189852 0.9998079313 1.313743e+00 9.643834e-01
## [623,] 0.111069875 0.164749041 0.7260500918 4.533663e-01 3.459995e-01
## [624,] 2.006064236 1.162237764 0.8158318617 7.723317e+00 5.926236e-01
## [625,] 0.837748391 0.886120295 0.9144532734 5.859711e-01 -2.299854e-02
## [626,] 0.926948902 0.945409557 0.8685571275 6.156605e+00 1.561198e-01
## [627,] 0.336330116 0.409779588 0.2224032478 7.233987e-01 1.203460e+00
## [628,] 1.200282669 0.560135037 2.0709464754 1.458018e+00 1.314708e+00
## [629,] 0.085427340 -0.044234730 1.3499233073 1.919404e-01 2.129034e+00
## [630,] 1.870547055 -0.188648246 0.4453007117 4.492998e-01 -2.479097e-01
## [631,] 0.519422226 0.057270060 0.5451588838 -4.149264e-02 2.697541e+00
## [632,] 0.049836414 1.923582933 -0.2683460258 1.140639e+00 1.474435e+00
## [633,] 0.511846850 1.836080653 0.4078722534 -1.009395e-01 1.810686e+00
## [634,] 3.917356342 1.517740960 0.1711017512 9.869371e-01 -1.512402e-01
## [635,] 0.712287315 0.049783066 1.2760150798 6.633107e-01 2.088748e+00
## [636,] 0.697318445 0.030121146 0.5146014332 7.917822e-01 4.056297e-03
## [637,] 0.041068383 1.093575919 2.3361684688 3.160085e+00 2.470884e+00
## [638,] 0.454157801 -0.033748820 1.0975585057 -4.935789e-03 1.244928e+00
## [639,] 1.336795109 1.153530430 0.0089602229 3.473446e+00 -8.382494e-02
## [640,] 1.255334374 3.479105617 0.1207296733 1.265020e+00 1.016961e+00
## [641,] -0.301649250 2.651378091 0.8860091685 3.146932e-01 8.452804e-02
## [642,] 0.952526040 0.435293907 0.7587530568 1.197904e+00 2.364962e-01
## [643,] 1.662866454 0.295084972 2.1209615667 1.428479e+00 2.433950e+00
## [644,] 1.210529748 1.021631503 1.4693011987 7.030902e-02 2.786120e+00

```

```

## [645,] 0.268270450 0.331250997 1.2538308849 3.190828e+00 2.451334e-01
## [646,] 0.039560758 0.224911031 1.9372019460 3.869867e+00 3.419157e-01
## [647,] 0.341665603 0.298021971 0.8466119515 6.650671e-01 6.995432e-01
## [648,] 0.446102153 0.044949352 0.5658269548 4.271259e-01 2.667016e-01
## [649,] 0.355876035 0.182513122 1.5823077755 3.073551e+00 4.145423e-01
## [650,] 0.723945161 0.881960540 -0.1790924723 2.518314e-01 2.042421e+00
## [651,] 0.403696359 1.039170930 0.3701961673 2.367729e-01 4.429225e-02
## [652,] 0.219631294 -0.213640529 0.6137179490 8.513086e-02 2.938868e-01
## [653,] 0.630404525 0.091802309 0.4513434018 1.472472e+00 1.331286e-01
## [654,] 0.051098629 1.693179387 0.5384552100 9.807351e-01 2.153153e-01
## [655,] 0.023703558 0.943236344 2.0324484644 1.502937e+00 7.447781e-01
## [656,] 0.818832094 1.516468203 1.1895517677 2.481595e+00 8.947471e-02
## [657,] 0.840712782 0.418824724 1.3569996949 1.789322e+00 -5.914967e-02
## [658,] 0.311865409 0.154838677 1.7209413830 4.128792e-01 1.447833e-01
## [659,] 1.849237083 1.499683880 0.6882529320 1.938062e+00 6.843130e-01
## [660,] 0.520572869 0.177672252 -0.1058839409 6.906139e-01 2.907671e+00
## [661,] -0.082729113 0.839498810 2.2175874160 1.471946e+00 1.082726e+00
## [662,] 1.488615714 0.375113041 1.4242960863 1.685619e-01 2.043663e+00
## [663,] 0.652348742 0.060592372 0.3034001303 8.330816e-01 6.923802e-01
## [664,] 0.641961916 0.402598042 -0.2193853736 1.811023e+00 2.913226e-01
## [665,] 0.105696368 1.140977394 1.6595423512 3.685143e-01 7.434885e-01
## [666,] 5.552210600 0.724897278 2.3959289041 7.403287e-01 1.209536e+00
## [667,] -0.079802929 2.866208021 1.3152414577 1.441397e+00 1.310843e+00
## [668,] 0.171200570 1.111239321 0.9327360193 4.542099e+00 -1.094061e-02
## [669,] 0.142514837 2.386765248 1.3397920959 -1.856836e-01 2.510256e+00
## [670,] 1.053998220 -0.030128099 2.1778412264 6.595204e-01 3.531921e-01
## [671,] 0.217289878 0.516032686 0.4502311634 3.472262e+00 6.184551e-01
## [672,] 2.630723453 0.978520569 0.9542337675 3.132819e+00 3.730851e-01
## [673,] 1.141014402 2.273807622 1.1170535806 2.115028e+00 1.137751e-01
## [674,] 0.107362598 1.218178407 -0.1938547586 5.238818e-01 5.125770e-02
## [675,] -0.430284011 0.002579928 0.5136355533 2.744159e-01 9.753897e-01
## [676,] 0.961056763 0.692245255 1.1690191877 2.998313e+00 5.802606e-01
## [677,] 0.696197275 4.106227626 1.3585707266 9.431959e-01 8.343863e-01
## [678,] 0.998831708 -0.094485690 5.0972042923 7.743026e-01 1.360567e+00
## [679,] 1.015447196 3.252906016 0.9729556716 2.175164e+00 1.415373e+00
## [680,] 0.190519794 0.873574536 0.9367637117 -1.126926e-02 3.517608e+00
## [681,] 0.305289430 0.584727111 -0.4061697566 4.909411e-01 3.057037e-01
## [682,] 0.908154733 0.693579938 2.8380011674 1.254222e+00 -1.561987e-01
## [683,] 0.109949622 0.452282235 1.2376741133 1.794206e+00 3.369129e-02
## [684,] -0.029677366 2.845187700 1.5118258242 5.373023e+00 1.112294e+00
## [685,] -0.219840583 3.277701944 0.3317141348 7.167223e-01 7.266661e-02
## [686,] 5.946249962 3.337549815 1.6489198365 1.538069e+00 -5.153139e-01
## [687,] 2.138288964 0.734562938 1.0597216377 1.569505e+00 4.069026e-01
## [688,] 0.718403591 -0.159388682 0.4580163748 4.868923e-01 1.805536e+00
## [689,] 0.350928286 0.088150937 -0.0530304582 1.672720e+00 2.400614e-01
## [690,] 0.753959756 0.605520129 1.2265759674 6.246712e-01 1.043387e+00
## [691,] 0.290701974 0.177801469 0.9446724209 2.588815e-02 -9.152640e-03
## [692,] -0.057962783 0.948266763 1.2216535791 3.236246e-01 1.585388e+00
## [693,] 0.386470935 -0.099316588 0.1753052797 -3.463969e-01 3.112240e-01
## [694,] 0.094337370 0.565830769 1.1172846734 2.197206e+00 1.239062e+00
## [695,] 3.690037963 1.291115016 0.0355169208 2.113358e-01 3.927635e-02
## [696,] 0.716389244 1.677224650 -0.0862155751 5.978404e-01 9.854918e-01
## [697,] 1.802549674 1.186297075 0.9829171978 4.547846e-01 1.652028e+00
## [698,] 2.636474497 1.043725101 2.2879956506 1.178149e+00 1.930415e+00

```

```

## [699,] -0.032384822 1.085473471 -0.0383420053 5.549987e-01 1.848691e-04
## [700,] 1.668617249 1.603894917 2.0365114829 2.389507e+00 2.470983e+00
## [701,] 1.347209797 1.305278032 0.3772352303 -8.581477e-02 7.321762e-01
## [702,] 0.277494163 0.106352250 0.4703791756 6.453093e-01 9.960126e-01
## [703,] 0.071516227 0.791179779 0.8354676810 1.199283e+00 4.620318e-01
## [704,] 0.567603631 0.287281851 0.4829580754 3.386572e-01 1.652158e+00
## [705,] 3.595414808 0.331653541 0.6470685712 3.740251e-01 1.948317e-01
## [706,] -0.233774319 0.040224154 0.1588244531 7.236613e-02 -4.424636e-01
## [707,] 1.203516248 0.200823992 1.8172479030 2.103283e+00 -1.647515e-01
## [708,] 0.451424721 -0.046890096 1.7585460965 4.171583e-02 6.782361e-01
## [709,] 0.376486579 2.749671441 2.8874193683 4.985232e-01 5.072332e-01
## [710,] 0.967721488 5.579629416 2.5114492875 2.043350e+00 6.752792e-01
## [711,] 1.255552169 4.031533129 4.8238478246 4.473762e-01 8.325871e-01
## [712,] 1.017223993 2.037456030 0.9389411173 3.064594e-01 1.670863e+00
## [713,] -0.277533667 2.739670987 0.6930654858 2.041541e-01 7.359419e-01
## [714,] 0.961582673 0.260044269 3.2794207933 6.180181e-01 3.506724e-01
## [715,] 0.750392222 0.408952975 0.8580767925 1.223804e+00 2.271339e+00
## [716,] -0.102656715 -0.002068248 0.5802042278 6.686629e+00 2.928325e+00
## [717,] 4.095878233 0.844084148 4.1066939160 3.760178e+00 2.114398e+00
## [718,] 0.688512192 0.577847476 0.6265643901 8.064644e-01 1.467804e+00
## [719,] 0.915851721 2.133050208 0.8317948399 -3.832483e-02 6.280368e+00
## [720,] 1.128415624 0.295496267 1.9996858764 -1.447738e-01 -1.397844e-01
## [721,] 0.087578293 -0.328916482 -0.2475100543 1.946869e+00 9.435347e-01
## [722,] 1.587977754 1.636000688 0.9167738675 1.666080e+00 5.036794e-01
## [723,] 4.355448219 0.301114364 0.1397783459 1.121665e+00 8.881629e-02
## [724,] 2.191582420 -0.115583578 0.1176239644 5.585141e-01 1.866022e+00
## [725,] 1.116488286 0.896209270 0.7732413229 1.162551e+00 9.004260e-01
## [726,] 0.703186348 3.547326063 1.5094291855 9.108625e-01 1.139669e+00
## [727,] 1.524009276 -0.171261577 0.8180529638 7.753001e-01 3.352070e+00
## [728,] 0.924401308 -0.297772747 1.3687578846 6.420076e-01 7.083483e-01
## [729,] 0.122134898 0.060117463 0.2015978221 1.390889e+00 1.904935e-01
## [730,] -0.065358564 0.476789226 0.3485866520 6.831368e-01 5.200384e-01
## [731,] 0.939998303 0.961048039 0.4150937255 7.906426e-01 5.157507e-01
## [732,] 0.379358630 0.876897254 -0.1005739265 1.748556e-01 1.968577e+00
## [733,] 0.259281435 0.702898652 2.0811431128 1.517710e+00 2.848054e-01
## [734,] 2.356002261 1.358808409 0.0527457922 2.965619e-02 3.085391e+00
## [735,] -0.104024914 0.410203448 0.4998242542 1.171989e+00 8.379932e-01
## [736,] 6.714646210 1.294319206 1.1161846034 1.332721e+00 6.117611e-01
## [737,] 0.102390957 1.175397199 4.1757347237 2.722504e+00 1.457013e+00
## [738,] 1.203880482 0.034751911 1.8668756818 8.625512e-02 8.975547e-01
## [739,] -0.002694250 0.239690745 0.1533138947 1.688655e+00 3.620317e-01
## [740,] 4.799425197 1.952051208 2.6064276074 8.880497e-01 7.226702e-01
## [741,] 0.154779824 1.596654380 0.2763303341 1.487061e+00 5.308278e-01
## [742,] -0.500496000 2.606650700 5.4953541158 1.853738e+00 8.860307e-01
## [743,] 0.958956140 1.708854874 0.6906727403 3.388737e-01 -8.185603e-02
## [744,] 1.110950334 0.908979859 -0.0170724234 5.338021e-01 4.951747e-01
## [745,] 2.775561248 1.992238773 0.3587944453 2.827454e-01 1.805142e+00
## [746,] 0.969154490 1.297170622 0.3217889496 1.228461e+00 3.179921e+00
## [747,] 1.102241025 0.182440239 0.6829878234 5.923425e-01 9.614771e-01
## [748,] 1.391683531 0.598118699 -0.0720216894 7.124955e-01 -4.108537e-02
## [749,] 0.264296091 0.860232191 -0.2890145061 4.804234e-01 2.561370e-01
## [750,] 0.446324263 0.863474180 0.2181323617 6.399307e-01 4.284861e-01
## [751,] -0.025562524 -0.085149649 2.7947786974 1.397843e+00 1.158274e+00
## [752,] -0.071260867 2.957444328 0.9966471866 4.766848e-01 2.867415e-01

```

```

## [753,] -0.247284729 2.934140607 1.8472136272 -3.218726e-01 5.189708e-01
## [754,] 3.498814046 0.584449246 1.3921792373 1.190067e+00 -2.382172e-01
## [755,] -0.029275778 1.652051903 -0.2755007511 1.924063e+00 1.554722e+00
## [756,] 0.933692765 0.407159573 0.2149405433 5.771106e-01 3.185560e+00
## [757,] 2.681347177 2.394172784 0.4942907112 3.656414e+00 2.424419e+00
## [758,] 1.411026236 0.076203657 2.9240472830 3.013087e+00 2.624460e-01
## [759,] 0.616710245 0.262109629 -0.0139899727 2.378028e+00 -1.709514e-01
## [760,] 0.408803375 1.089210174 2.0662657593 2.176272e+00 6.059791e-02
## [761,] -0.107899529 1.249571348 0.9656167154 2.065542e+00 1.057022e+00
## [762,] -0.224247763 0.844111809 3.0977974019 9.524848e-01 1.694391e+00
## [763,] 1.819744044 0.228607495 0.2878448015 1.374360e+00 7.004582e-01
## [764,] -0.190106261 0.354118048 3.9642775127 5.286797e-01 1.464464e+00
## [765,] 0.777401947 1.221880940 0.1773503659 8.451874e-02 4.010722e-02
## [766,] 0.560306713 0.396394396 0.0398950490 9.085769e-02 -2.511486e-02
## [767,] 0.448885112 1.457957667 0.4043308539 -9.854256e-02 3.957070e-01
## [768,] 0.758330800 -0.126559347 -0.0214370132 2.534664e+00 9.194735e-01
## [769,] 0.004723277 0.822990782 0.9862863811 1.075033e+00 1.661541e-01
## [770,] 1.643117981 1.732869426 3.8329764994 3.703548e-01 1.918625e+00
## [771,] 0.076547115 1.934020361 -0.3412580369 4.320146e+00 2.357251e+00
## [772,] 0.209839477 0.137784852 3.4837517934 1.383441e+00 9.892245e-02
## [773,] 0.451018184 0.622011660 0.2872357996 2.144023e+00 1.188411e+00
## [774,] -0.124909395 0.071911356 0.3105262466 1.159074e-02 2.182256e-01
## [775,] -0.121150171 2.124287576 2.0731583292 -8.978908e-02 1.148115e+00
## [776,] 0.717289126 0.453275105 0.6663152760 1.517654e+00 1.905022e+00
## [777,] 2.027376771 0.648764033 2.9493339214 4.671368e-01 3.615971e-01
## [778,] 4.053031371 0.324196573 0.2210007910 3.706189e-01 1.182390e+00
## [779,] 0.176472682 0.142580112 0.7296653995 4.099984e-01 7.346634e-02
## [780,] 0.580908731 8.506186109 0.5504025937 -4.400758e-02 -2.611647e-01
## [781,] 0.515056710 1.141855862 1.2271654873 7.046554e+00 1.580896e+00
## [782,] 0.992507846 0.343618836 -0.0468716390 -2.423865e-02 1.038843e+00
## [783,] 0.057984837 0.583536997 0.5404946244 1.837376e+00 2.189643e-01
## [784,] 0.376336751 -0.074157871 1.1418261338 4.082690e-01 1.350922e+00
## [785,] 0.051846954 0.351700272 2.5440082649 1.001231e+00 1.062447e-01
## [786,] 1.021704764 0.144377667 0.0273895453 9.994932e-01 3.416325e+00
## [787,] 1.076647241 0.177074141 -0.0647927666 6.650339e-01 1.750306e+00
## [788,] 2.890228245 0.427488613 -0.2487194814 2.385480e+00 1.962202e-01
## [789,] 0.284641773 1.557614547 2.7213209370 2.442509e+00 -9.504529e-02
## [790,] 0.228825689 2.290947373 1.0224668248 5.500332e+00 1.470500e+00
## [791,] 0.388238331 0.372520942 1.3403744316 1.216941e+00 2.533089e+00
## [792,] 0.322515042 0.724645227 0.2110537692 7.512539e-01 2.256309e+00
## [793,] 2.901952998 0.087389746 0.8007149811 2.258227e-01 3.878788e-01
## [794,] 0.415975004 1.083344597 -0.0202343331 3.381712e+00 9.384111e-02
## [795,] 0.371014116 0.441472789 1.7318992358 4.058455e-01 -3.059640e-02
## [796,] 1.546411250 8.979673113 0.0408873845 9.967817e-01 4.007035e-01
## [797,] 0.009654621 0.232612205 -0.2598153794 1.000910e+00 3.001734e-01
## [798,] 1.007833830 1.040972457 0.0647004877 1.123306e+00 7.940259e-01
## [799,] 0.209831487 0.600415562 -0.3901234228 1.318387e-01 -2.137887e-01
## [800,] 0.081748754 1.509974346 0.5913460332 7.300090e-01 2.130016e-01
## [801,] 1.719345392 1.951378206 0.5587771608 1.565466e+00 -7.730739e-02
## [802,] 1.182484657 1.218953250 0.4138492638 1.860819e+00 3.418434e-01
## [803,] 0.205436932 -0.095085482 1.2729664854 4.355230e-01 1.678931e+00
## [804,] 0.311071837 0.534197720 0.0375354384 -1.326040e-01 8.742916e-02
## [805,] 0.081445081 2.215118590 1.1139294466 2.270719e+00 6.560164e-01
## [806,] 4.269205140 0.159566099 1.5199036482 1.087564e+00 1.148276e+00

```

```

## [807,] 1.233345831 0.068912265 0.2113612051 1.115844e-01 -1.131039e-01
## [808,] 0.155874939 1.367672613 0.4098711123 1.986164e+00 1.157236e+00
## [809,] 0.613543066 0.627634651 0.2089500875 6.420675e-01 1.027008e+00
## [810,] 0.826722712 4.962906244 1.2318113910 2.329164e+00 9.481891e-01
## [811,] 0.733950012 1.116062990 0.2160319162 2.601458e+00 1.318187e+00
## [812,] 0.467541183 1.436866610 1.8992213658 6.796413e-01 1.875066e+00
## [813,] 1.087141507 2.935121895 0.3263568766 2.609336e-01 4.109967e-02
## [814,] 0.272669735 1.543413040 -0.2594466208 6.633432e-01 -9.714354e-02
## [815,] 2.236423954 1.645478263 0.0431855872 2.395600e+00 2.294488e+00
## [816,] 0.002045925 2.205201886 1.1982709517 1.783498e+00 5.335730e+00
## [817,] 1.428514681 2.793437135 0.0915761081 2.537295e+00 1.760419e+00
## [818,] 2.487954658 1.476903473 0.1739626051 8.011774e-01 2.929216e+00
## [819,] 0.291082493 0.018939664 -0.1481866667 9.570731e-01 4.077849e-01
## [820,] 2.127884226 0.124022775 3.3489158129 3.643803e-01 4.411697e+00
## [821,] 0.193446938 2.649791757 0.3389229470 4.798640e-02 2.183320e+00
## [822,] 3.692345985 2.810757256 0.4265752718 7.481162e-01 4.433645e-01
## [823,] 6.346603696 1.546429207 2.3641411198 6.013818e-01 -5.201396e-02
## [824,] 0.217891023 1.570215070 0.9664244096 6.611097e-01 1.115021e+00
## [825,] 0.182207521 1.285440985 2.5864316712 -1.126243e-01 9.892538e-01
## [826,] 0.770393036 0.499529288 0.2799248366 9.460490e-01 2.627990e-01
## [827,] 0.549907387 0.075612894 0.2992776455 1.712182e+00 1.596731e+00
## [828,] 1.580162034 0.905412667 1.4241244289 -1.951818e-01 5.754667e-01
## [829,] 0.175677470 0.663729789 0.8635584397 3.545806e+00 2.268926e-01
## [830,] 0.593743102 0.072041772 0.0063702276 1.794152e+00 1.364576e+00
## [831,] 1.622804599 0.250537150 1.3995891848 5.953862e-01 1.958190e+00
## [832,] 0.818271769 0.048577536 5.1626626515 3.322300e-01 1.094048e-01
## [833,] 0.592616127 1.692253456 0.1876185484 1.221250e+00 1.357678e+00
## [834,] 0.857813725 1.520783066 0.2576395951 9.001093e-01 1.168026e+00
## [835,] 0.216081595 0.367912458 2.8920337151 8.617640e-02 2.105002e+00
## [836,] 0.946074053 0.065429155 2.5223531754 1.828633e-01 1.522706e+00
## [837,] 0.785726394 1.436098323 1.9153833509 1.171974e+00 -9.899055e-02
## [838,] 5.392833561 0.048760861 4.8700081576 1.048018e-01 1.271862e+00
## [839,] 1.579091320 0.674121897 0.7784360600 6.326988e-01 -1.133525e-01
## [840,] 1.017366394 0.255426521 0.6960016954 8.231037e-01 2.539247e+00
## [841,] 0.711088099 1.676263586 1.7732671082 1.748741e-01 8.393378e-02
## [842,] 0.764640111 0.643164751 1.1606149156 1.503257e+00 -1.716568e-01
## [843,] 1.548866303 2.728999912 -0.0100737819 7.495331e-01 -1.013164e-01
## [844,] 1.134530264 -0.087415543 0.2507073767 8.568826e-01 1.889266e-01
## [845,] 0.481563542 0.672184916 0.4926916826 -3.312277e-02 5.583270e-01
## [846,] 0.213347318 0.407023579 1.5618972172 -1.521253e-01 5.912675e-01
## [847,] 1.100719974 1.573045048 3.8130125496 1.303161e-01 3.119132e+00
## [848,] 1.099560212 4.707495531 1.6044869804 2.602409e+00 6.109496e+00
## [849,] 0.053837931 3.681693746 3.2385537292 1.323309e+00 3.989542e-02
## [850,] 1.240721345 0.656923390 0.4018805892 3.304554e-01 1.454391e+00
## [851,] -0.148971579 1.277213427 1.3789276657 7.353914e-01 1.141437e+00
## [852,] 0.604283890 1.232893072 0.3897511694 6.168299e-01 1.287791e+00
## [853,] 0.883593084 0.336037616 3.8808767225 1.737336e-01 2.486012e+00
## [854,] 1.761587450 -0.009472455 -0.1002832939 8.230650e-01 -2.276451e-01
## [855,] 0.493971530 0.347677964 0.2888695100 2.218757e-01 -2.026751e-01
## [856,] 4.628739675 0.254129543 0.8421904560 8.363903e-01 4.567713e-01
## [857,] -0.115084878 1.582469199 3.8179193904 8.596956e-01 1.536360e+00
## [858,] 0.167930979 2.540917435 0.7044136356 1.498961e+00 5.472000e-01
## [859,] 1.563708688 0.054175409 -0.0319391890 8.103013e-01 4.872217e+00
## [860,] 0.340573554 0.399550141 0.2305279154 -1.741015e-01 1.174932e+00

```

```

## [861,] 1.152646664 4.662844296 0.9416812999 1.952904e+00 1.287052e+00
## [862,] 1.710395005 0.700630048 0.4076276357 1.880925e+00 -4.830614e-02
## [863,] 1.323308549 -0.064056732 0.6107086608 -5.202449e-02 3.154687e+00
## [864,] 2.000457476 3.406249439 1.9911150446 4.212244e-01 8.967765e-01
## [865,] 0.916124207 4.478785916 1.6214323890 3.006039e-01 3.178733e+00
## [866,] 0.408666070 1.419230600 0.4122716802 -2.997187e-01 -8.692164e-02
## [867,] 0.479424284 1.100974733 0.0496625736 5.595275e-01 3.806459e+00
## [868,] 0.318913640 0.611741681 -0.3308748644 8.984085e-01 3.380665e-01
## [869,] 0.136741615 0.936669285 0.6340755281 4.432624e-01 -1.303333e-01
## [870,] 2.207578396 0.828926039 1.0778637227 6.876200e-01 9.572336e-02
## [871,] -0.223054206 0.783709651 0.4501017501 2.166168e-01 4.069547e-01
## [872,] -0.309463977 -0.142741170 0.3161161956 3.556111e-01 3.229847e-01
## [873,] 0.239256315 0.639667491 0.8478147747 1.945977e-01 4.307941e-01
## [874,] 0.221413778 -0.013193355 0.4971899999 9.736695e-02 2.898222e-01
## [875,] 0.362532511 5.755717878 0.6215850987 2.959889e+00 7.407755e-01
## [876,] 0.535170344 1.702459020 0.1509260252 6.465730e-01 3.039365e+00
## [877,] -0.210292787 -0.194508455 0.3220270950 1.597945e-02 -1.813798e-01
## [878,] 0.006898822 0.674771522 0.6152817658 4.677141e-01 -2.328060e-01
## [879,] 0.787077068 2.593240973 -0.2083397975 6.095151e-01 5.611765e-01
## [880,] 1.044375797 1.123067346 0.3479367667 1.718399e-01 5.491425e-01
## [881,] 2.888915064 0.114171108 0.1680629549 1.097532e-01 -1.731879e-01
## [882,] 1.813488649 5.103656699 0.5008947003 3.745265e-01 -2.098327e-02
## [883,] 0.635281625 1.535498330 0.6570654189 2.271662e+00 1.638354e+00
## [884,] 1.396632380 1.772428115 0.3530741709 -6.177261e-06 1.029086e+00
## [885,] 0.721153284 6.396206920 1.1576386343 1.671268e+00 3.320348e-01
## [886,] 0.616503957 0.150084424 0.5256785509 3.819467e-01 2.259812e-01
## [887,] 0.079135585 0.792204138 1.2479861544 5.533035e-01 7.442397e-01
## [888,] 1.465658042 0.520851230 0.9858527073 1.540648e+00 1.000528e+00
## [889,] 1.443278989 0.439305872 0.5795636788 2.675382e-01 5.398926e-01
## [890,] 1.905019996 3.360174381 1.1747752395 5.034319e-01 1.886491e-01
## [891,] 0.517283848 1.300054592 2.0307353739 1.041300e+00 6.530582e-01
## [892,] 0.494115821 1.129692128 -0.2154163434 8.524110e-01 -1.926815e-01
## [893,] 2.795966654 2.644355454 0.2037939501 4.073958e+00 1.338466e+00
## [894,] 0.856974235 1.120851661 2.7945827264 -1.403068e-01 7.566905e-01
## [895,] 0.513873376 2.315726371 2.7894898120 7.049994e-01 3.012782e+00
## [896,] 0.879641721 0.945783406 1.1424117348 2.709717e+00 -2.934527e-02
## [897,] 0.211132724 -0.019241225 1.5980858794 6.579752e-01 2.001822e+00
## [898,] 0.651751337 1.331474846 0.1882901081 4.068145e+00 2.869187e+00
## [899,] 3.470903355 2.336385641 0.4623134324 2.894296e+00 -6.229038e-03
## [900,] 0.122919374 0.521331703 1.9560534815 2.635261e+00 5.926718e-01
## [901,] 1.128126860 1.232188900 0.3632263494 5.388051e-01 1.730084e-02
## [902,] 0.739599201 0.350959017 3.4703115483 3.287101e+00 -5.145179e-01
## [903,] 0.093738529 1.677905361 0.2176181799 1.693457e+00 2.077223e-01
## [904,] 2.153051538 0.242404015 1.1844867630 4.158008e-01 1.807621e+00
## [905,] 3.609214664 3.127251123 3.9904713534 -1.796414e-02 2.103192e+00
## [906,] 1.127264183 0.981451536 0.5752253626 7.063373e-01 1.464313e+00
## [907,] 0.791194817 1.788927698 0.0280517781 -2.801627e-01 7.616646e-01
## [908,] -0.129723537 0.107535783 5.4457177344 1.097289e+00 4.658250e+00
## [909,] 0.355270762 0.551914395 0.4090805155 1.611803e-01 2.016404e+00
## [910,] 0.986895931 0.767356138 0.1560942123 4.552776e-01 1.460046e+00
## [911,] 2.547181039 0.362577977 1.8719429641 -2.391962e-01 1.747243e+00
## [912,] 0.482565443 2.230728558 0.8693783417 1.866110e+00 4.074745e-01
## [913,] 1.768743868 -0.124476783 0.0169389857 6.018987e-02 1.772170e+00
## [914,] -0.169184363 0.156470510 -0.0390758969 -7.698736e-02 9.867170e-01

```

```

## [915,] 1.247033595 -0.134922629 0.5226864558 3.087736e+00 7.093354e-01
## [916,] 0.078545099 0.926536241 1.0933019501 7.780069e-01 3.013580e+00
## [917,] 0.297605562 1.659633523 5.7922837285 1.238091e+00 1.518864e+00
## [918,] 0.104025388 0.157015590 0.6705050255 1.238444e+00 8.909112e-01
## [919,] 0.474515553 -0.054397229 1.5355220458 5.876693e-01 4.490820e-01
## [920,] -0.166230655 2.252773084 0.6738317415 5.096116e+00 3.568525e-01
## [921,] 0.867741930 1.989600838 0.9610432040 6.760908e-01 2.901505e+00
## [922,] 0.367684181 2.164270063 0.4807093200 5.190254e-02 1.194027e+00
## [923,] 0.361872045 0.309504718 1.9171912491 1.918503e+00 2.998689e+00
## [924,] 1.157668568 3.672022243 2.3617654605 1.672357e+00 3.286152e+00
## [925,] 0.731716890 0.794259844 0.5050794513 2.208693e+00 3.806906e-01
## [926,] 2.089647121 1.052918431 0.9649685318 5.238262e-01 -1.211020e-01
## [927,] -0.074911740 0.283135910 -0.2795565273 1.643042e+00 2.372426e+00
## [928,] -0.095565069 0.193835283 1.5032745893 7.635667e-01 -8.509908e-02
## [929,] 0.531535137 0.111531879 0.8221986695 1.133271e-01 5.825635e-01
## [930,] 1.240170496 1.245040015 0.0545343922 2.977999e-01 4.155819e-01
## [931,] 1.413114286 0.385224763 1.1983272361 2.861161e+00 2.490982e-01
## [932,] 4.939990132 -0.017423143 1.2469412479 2.441989e-01 2.608405e-01
## [933,] -0.142865431 0.900503928 4.2541118188 9.876673e-01 4.347262e+00
## [934,] 0.958275844 0.683348573 0.2890867932 5.093140e-01 5.980467e-01
## [935,] 1.057832565 0.073438724 0.4832767638 4.090558e+00 4.821082e-01
## [936,] 2.345726205 0.120035103 0.8130943170 1.398303e+00 1.122160e+00
## [937,] 0.327890488 0.706268966 2.8302271990 1.614156e+00 1.172495e-01
## [938,] -0.017758733 0.099769385 0.2097031430 1.248206e-02 2.092664e+00
## [939,] 4.538103506 1.106573613 1.1072668869 1.736736e+00 6.252032e-01
## [940,] 0.769655875 1.070123055 2.0365566441 1.175576e+00 5.966030e-01
## [941,] 0.146993204 1.277886890 0.1522445326 1.540870e+00 1.932407e+00
## [942,] -0.017766706 -0.108531462 -0.1759841357 2.916325e+00 4.232333e-02
## [943,] 0.155142965 1.354540219 0.6978136804 9.074787e-01 2.039109e+00
## [944,] 1.737271115 0.813683883 1.0768021924 5.890115e-01 3.535190e-01
## [945,] 1.502592724 0.481298415 0.3366939908 1.623489e+00 3.603543e+00
## [946,] 0.746219161 0.810218888 0.4709986677 1.896544e+00 9.571550e-01
## [947,] 0.017031855 0.102946983 0.3880087112 4.443357e-01 2.890437e+00
## [948,] 2.867152965 0.475207175 1.0024897124 1.527771e+00 1.471077e-02
## [949,] 1.453758550 0.928923531 1.9086809224 1.450721e+00 1.178519e+00
## [950,] 1.311872529 -0.007367077 1.7336253803 6.443989e-02 5.114316e-01
## [951,] 0.179491041 1.028747353 0.7285014232 1.597629e-03 1.658532e+00
## [952,] 0.521024956 1.178731097 0.4492201771 1.044761e+00 8.069675e-01
## [953,] 0.345864013 2.927202181 0.4920217828 1.636804e-01 1.596710e+00
## [954,] 0.357737102 0.377349439 0.0201349926 7.810600e-01 8.114803e-01
## [955,] 1.349763635 -0.224717483 1.5696703073 1.122409e+00 1.955790e-01
## [956,] 4.436439609 -0.069794243 0.2435395339 3.735716e+00 1.450052e+00
## [957,] 0.168370805 0.096659314 0.6350572999 9.260907e-01 5.462145e-01
## [958,] -0.141906978 0.641722319 0.0713267383 9.150928e-01 2.467050e+00
## [959,] 2.014079674 -0.184277488 0.3574594004 2.732762e-01 8.823656e-01
## [960,] 0.624857557 1.095668778 0.5494812400 1.615410e+00 2.259219e+00
## [961,] -0.257469466 0.364508196 0.2364808855 8.496009e-01 9.285711e-01
## [962,] 0.988526735 1.175780756 1.6257222959 3.054240e+00 1.426402e-01
## [963,] 6.368461832 0.147594973 -0.1035748245 7.245857e+00 2.226875e+00
## [964,] 1.773781279 0.888133175 1.1320113544 -1.786499e-02 5.311028e-01
## [965,] 1.139855578 0.341415180 2.6762887819 7.709626e-02 6.006744e-01
## [966,] 2.256990714 1.340547072 1.4953511424 2.024881e+00 -1.420355e-05
## [967,] 0.364499161 -0.057423513 -0.0858821821 9.973819e-02 1.143745e-01
## [968,] 0.472470914 1.211657969 0.2281700580 1.563674e-01 8.003042e-01

```

```

## [969,] -0.261817515 0.701174855 2.7793166007 1.024348e+01 2.785996e+00
## [970,] 2.214227933 2.299161151 0.0090249098 2.152531e-02 3.477612e-01
## [971,] -0.253852889 3.490553595 -0.1650460365 3.654204e-01 3.109079e-01
## [972,] 0.522815221 1.327158632 0.0019522667 7.634216e-01 9.602052e-01
## [973,] -0.061902380 0.915663807 4.8161329473 1.969703e-01 2.180063e-01
## [974,] 2.763506794 1.355431371 -0.3642970845 1.450273e+00 2.208090e+00
## [975,] 1.301692954 -0.206268461 2.8644349426 9.529018e-01 1.249540e-01
## [976,] 0.144492851 -0.266757594 0.1962388147 3.281607e-01 2.112228e-01
## [977,] 0.648900478 1.867459617 1.4268988404 4.349577e-03 2.902496e+00
## [978,] 0.923350315 0.472423230 1.7964043785 3.165801e+00 1.339729e+00
## [979,] 1.030755416 3.734385436 4.3195411683 -3.419998e-01 2.560434e+00
## [980,] 3.757959848 1.058917540 2.8019543412 1.349730e+00 5.056302e+00
## [981,] 0.616655232 2.868335233 1.8968992073 3.002173e+00 3.096416e+00
## [982,] 1.053930692 1.920099621 3.5817187731 1.401189e+00 2.911638e+00
## [983,] -0.088165194 0.091396847 1.7468714950 3.386404e-02 -6.029191e-02
## [984,] 0.323844037 7.201449407 1.1640307942 1.508671e+00 7.622756e-01
## [985,] 0.595090301 0.465076587 0.0560894766 1.106647e+00 6.644729e-02
## [986,] 2.114493280 1.811151638 0.8208413821 8.611091e-01 2.900337e-01
## [987,] -0.001029639 0.411528280 0.1170778072 1.207646e+00 3.250169e-01
## [988,] 1.907313131 0.250909573 1.8110294038 2.754794e-01 7.184259e-01
## [989,] -0.002985164 1.131843632 0.9326948236 2.345695e+00 2.112320e-01
## [990,] 0.028549398 0.283695845 0.7318246183 1.707934e-01 4.273275e-01
## [991,] 0.541622009 0.510603125 0.2204632683 1.820065e+00 7.728611e-02
## [992,] 3.407073186 2.913824122 2.6957587938 2.802186e+00 1.645367e+00
## [993,] 1.799056969 6.224145023 3.0848035197 7.619023e-01 5.904557e-01
## [994,] -0.083064689 1.010651986 1.0920730454 3.525352e-01 1.200623e-01
## [995,] 0.535724491 0.336665869 1.0845150875 8.763568e-01 1.022294e+00
## [996,] 2.137467764 1.820193996 0.8623868590 5.508827e-01 7.516022e-01
## [997,] 4.111207288 -0.002510445 1.7391054013 1.088799e+00 8.311606e-02
## [998,] 1.417997804 0.712010950 -0.0083882011 9.772184e-01 5.965991e-01
## [999,] 0.685562782 0.533764033 2.0168288367 8.993244e-02 3.840638e-01
## [,11] [,12]
## [1,] 0.0483114279 0.3000627356
## [2,] 0.9281272117 2.6926034076
## [3,] 1.0514403060 0.0982008928
## [4,] 0.0691378760 0.2902980921
## [5,] 1.8290714589 0.2272396924
## [6,] 0.0383415235 0.5938297217
## [7,] 0.9569841390 0.4651917299
## [8,] 2.8967139911 0.9353347742
## [9,] 0.8232081401 2.1133757146
## [10,] 0.3523110368 1.6944676493
## [11,] 0.7719234337 0.0697731343
## [12,] 0.2924627615 0.4390515283
## [13,] -0.1275467666 1.5061393768
## [14,] 0.4319923146 2.0834012360
## [15,] 0.4684502353 0.6221802290
## [16,] -0.0377171253 1.6067151890
## [17,] 0.6655121475 0.0162341354
## [18,] 1.5838941659 1.5230644520
## [19,] 0.8535842764 -0.1805484749
## [20,] 2.8814255020 -0.2838219478
## [21,] 0.8896435482 0.2804063341
## [22,] 0.1575575239 -0.1066780270

```

```

## [23,] 0.0766470599 2.0675328118
## [24,] 3.7425621817 0.6648624096
## [25,] 5.1186601938 0.8252993039
## [26,] 0.8969443338 0.1767791693
## [27,] 1.5234725299 1.1649253910
## [28,] 0.8167497887 1.3512300867
## [29,] 1.2794017474 0.9796032280
## [30,] 0.4284242848 0.1563331013
## [31,] 0.2692454530 0.2287428297
## [32,] 0.8046638793 1.5420983642
## [33,] 0.5649986090 1.0956629407
## [34,] 1.2854646932 2.1282749607
## [35,] 0.3313372809 1.3154677409
## [36,] 3.1212131852 3.3870797650
## [37,] 1.2227672604 0.8066411239
## [38,] -0.3095302615 4.0475276365
## [39,] 1.8419318083 0.1866950450
## [40,] 1.0084288499 1.7681362440
## [41,] -0.0423592750 0.3330871093
## [42,] 0.9037458974 0.5062204068
## [43,] 0.0810787564 2.1164061995
## [44,] 2.0561367316 1.3148040141
## [45,] 1.3296369603 0.7828814419
## [46,] 1.8443621837 0.9684488054
## [47,] 2.2745252316 0.4823423449
## [48,] -0.0275140609 0.5271611348
## [49,] 1.2424516465 0.1002541487
## [50,] 2.5650743174 0.6767709107
## [51,] 0.9040674701 0.0353361650
## [52,] 1.1695716240 2.1916940317
## [53,] -0.0883954400 0.8450604247
## [54,] 1.2341547903 0.5388273195
## [55,] 0.3169782710 2.7778757468
## [56,] 0.6043388264 0.3416635808
## [57,] 0.3077495431 0.8701784742
## [58,] 0.9836684589 0.4365373196
## [59,] 0.5192609958 1.3054355405
## [60,] 1.0391762988 0.4024005106
## [61,] 0.4710288328 2.6910868141
## [62,] -0.1209459327 0.2144162417
## [63,] 1.1289986855 0.5420212990
## [64,] 0.8928051688 -0.1310112911
## [65,] 0.7327038903 0.4208999412
## [66,] 2.5909743182 0.6637221670
## [67,] 1.5392041361 1.3125126839
## [68,] 0.8160646214 6.9847302481
## [69,] 0.9265127350 0.4745724713
## [70,] 0.9938346721 -0.0731892233
## [71,] 1.4751293950 0.3780817657
## [72,] 0.0776017423 0.9222956783
## [73,] 0.0195965462 0.6142724145
## [74,] 0.8768241964 0.7616502544
## [75,] 0.1658535465 -0.0276952841
## [76,] 0.7090002625 1.1312931043

```

```

## [77,] 0.3079533591 0.8588486894
## [78,] 0.2491598633 0.8722807626
## [79,] 0.8904845707 0.7563119175
## [80,] 0.1130885981 0.0699727845
## [81,] 2.8271826898 1.4565060578
## [82,] 0.7874481770 0.1009681442
## [83,] 0.7210232151 2.1415848614
## [84,] 1.4579857126 0.9204281586
## [85,] 0.1066044541 3.1442535532
## [86,] 2.1335235874 0.9915207088
## [87,] 0.6363542759 0.0706461701
## [88,] 0.5941330514 1.0173659072
## [89,] 3.9775351154 1.0936736869
## [90,] 0.3316532374 2.2773058288
## [91,] 0.4974294190 0.4768554611
## [92,] 0.8082295537 0.4740304746
## [93,] 1.1413696948 0.0277927379
## [94,] -0.0253863311 -0.4425184810
## [95,] 0.1363953780 0.1958044976
## [96,] 0.2018123953 -0.0306712354
## [97,] 0.4687523985 1.4810161788
## [98,] 4.1794546016 1.8869383308
## [99,] 1.9020517248 1.1426514876
## [100,] 0.1954023617 0.4335307182
## [101,] 1.0458141741 1.8124147498
## [102,] 1.0308406230 -0.0661199200
## [103,] 2.3139360751 0.4575066134
## [104,] 0.3252829426 0.3162737666
## [105,] 1.1899559109 1.9235006472
## [106,] -0.4427277303 -0.1295886976
## [107,] 0.4446463462 2.0451077735
## [108,] 2.5820004920 -0.0615522590
## [109,] 0.3129595213 6.0900014710
## [110,] 1.5158469694 0.1338730100
## [111,] 0.3574956811 0.3249923899
## [112,] 5.3201636171 1.1588817052
## [113,] 2.2347509418 0.1883545462
## [114,] 1.6459348273 2.0052491923
## [115,] 0.1269578951 0.4399553285
## [116,] 1.0156131750 0.5717978504
## [117,] 0.4770148629 0.3093254291
## [118,] 0.0409538790 3.0086505790
## [119,] 0.2053203384 -0.0335532502
## [120,] 2.3078385087 2.0254251174
## [121,] 1.2859084312 0.5108478732
## [122,] -0.2984792721 0.9471168810
## [123,] 2.4762801408 0.6147055368
## [124,] 1.1246736962 1.2456282241
## [125,] 1.8234886146 1.1866418569
## [126,] 0.1592614043 0.1360400029
## [127,] 1.9539635528 1.8876617587
## [128,] 0.6005150536 0.1979517011
## [129,] 1.2496669796 0.3480652028
## [130,] 0.1567694467 0.9895975624

```

```

## [131,] -0.2407725682 0.4314055167
## [132,] 0.7513628227 0.2384909894
## [133,] 0.8937651946 0.5533804411
## [134,] 0.2398659970 1.0919819864
## [135,] 0.1814103893 6.0312441132
## [136,] 2.4939103770 0.8197085103
## [137,] 0.9077274021 0.0477253142
## [138,] 0.7901713471 0.2953554124
## [139,] 0.7198158241 4.0987207259
## [140,] 1.5108777914 0.9571909936
## [141,] 1.8650965917 0.3669559372
## [142,] 1.1024316403 0.3092338431
## [143,] 1.5114885110 2.3802598447
## [144,] 0.1924123091 0.2052458349
## [145,] 3.4336396957 0.2880294386
## [146,] 1.6838578525 1.1785280682
## [147,] 0.3876525253 -0.1545295984
## [148,] 0.0186536331 -0.1928258729
## [149,] 0.0042455789 0.6170012655
## [150,] 1.2486505591 2.5497557270
## [151,] -0.0204329806 -0.2361207541
## [152,] -0.3666227814 0.6918809366
## [153,] 3.5423551352 1.1615431997
## [154,] 0.4070793672 0.8931045468
## [155,] 0.1388316872 0.8560129747
## [156,] 0.0919067977 0.9193424132
## [157,] 0.0912542785 0.1922762026
## [158,] 3.0418300818 -0.1458220551
## [159,] 3.6921847773 0.2640920750
## [160,] 1.5592640967 2.1118005301
## [161,] 1.2154206918 0.8949774343
## [162,] -0.1128113573 0.4097532771
## [163,] 0.0855086755 0.6166205577
## [164,] 2.1325654050 5.4998419172
## [165,] 0.5776861148 0.8878801963
## [166,] -0.1109102651 -0.3626948125
## [167,] 0.6044351693 1.1019446633
## [168,] 0.0798656348 1.3752536837
## [169,] 0.2581467587 3.2148251528
## [170,] 0.8754440427 1.0174923238
## [171,] 0.0760142839 0.9521444641
## [172,] 1.5666525519 -0.1477726048
## [173,] 1.0614790533 1.7334902772
## [174,] 0.3050644249 0.4292055358
## [175,] 0.8307057213 0.6041332637
## [176,] -0.0565266224 0.6700411462
## [177,] 1.6661483248 0.0959720002
## [178,] 1.5148762537 0.0838768536
## [179,] 1.0242952619 1.0472231984
## [180,] 0.4332119230 0.8650404024
## [181,] 0.6895309090 2.3721389746
## [182,] 0.4797673875 0.1522931558
## [183,] 0.4359065693 0.7087342089
## [184,] 0.9604223530 1.3409757062

```

```

## [185,] 0.6667283283 1.7352285794
## [186,] 0.1231038899 2.1972296163
## [187,] 0.6037871607 0.2499826815
## [188,] 5.2071078645 0.0808253521
## [189,] 0.1138656615 0.5258182907
## [190,] 1.9625822338 0.3898039261
## [191,] -0.0550258902 0.1554802577
## [192,] 2.6554318252 0.1599421468
## [193,] 0.0111290360 0.7021276403
## [194,] 0.3704529423 1.0555372589
## [195,] 0.3449827872 -0.2307325644
## [196,] 0.4664088319 0.5763251972
## [197,] 3.4214744892 0.0355335619
## [198,] 2.4403956003 1.6964784710
## [199,] 3.7814539421 -0.0944603099
## [200,] 0.4791669702 1.6646994977
## [201,] 0.2504470966 0.3641618529
## [202,] 3.7396226417 1.2746776026
## [203,] 0.3245218055 3.7356172622
## [204,] 0.3587838744 0.6358558856
## [205,] 0.4009568575 2.7926910555
## [206,] 0.7324998381 0.2493131800
## [207,] 0.4913579975 0.1451472477
## [208,] 0.2040509639 0.0672162726
## [209,] 1.3181621835 0.3906619211
## [210,] 2.9639712256 0.4397010889
## [211,] 0.6861943457 1.2707161421
## [212,] 0.1693422201 0.2210834842
## [213,] 0.4315685577 1.0478689369
## [214,] 0.6877386334 2.1786846371
## [215,] 0.2259725069 1.4929244811
## [216,] 0.8035349865 1.7550118825
## [217,] 1.8063933452 2.4403103206
## [218,] 1.2906087681 0.1578459473
## [219,] -0.1503239687 1.6361086532
## [220,] -0.2170947699 0.5506625845
## [221,] 3.6508411881 1.1556497883
## [222,] -0.1304627512 1.5405099579
## [223,] -0.2116980279 1.0057183791
## [224,] 0.1123873803 0.2758583408
## [225,] 1.6804957592 0.3579536440
## [226,] 0.3976440955 1.4653961737
## [227,] 0.6927091634 0.1998906846
## [228,] 1.0964197764 0.3292546260
## [229,] 0.4228489472 1.0791226156
## [230,] 0.8361690328 0.5170397355
## [231,] 0.1967373227 0.6094403035
## [232,] 2.3950092483 1.3523512638
## [233,] 2.1667642310 0.7270804397
## [234,] 0.4658135527 0.6410672804
## [235,] 0.9068442677 0.7158362478
## [236,] 0.0140227853 1.0029024707
## [237,] 1.6806081184 0.3169524904
## [238,] 0.6555561601 0.9220375831

```

```

## [239,] 3.6444207882 -0.2266508080
## [240,] -0.3808521731 4.2910124731
## [241,] 3.0609990367 1.1460731149
## [242,] 0.2560987750 2.2632038553
## [243,] -0.0474682568 0.1437278545
## [244,] 2.5001352884 0.2734503527
## [245,] 0.7410003289 0.2125697578
## [246,] 1.0271562149 0.0645059328
## [247,] 1.1768895846 0.4882204744
## [248,] 3.1632714673 1.7540346443
## [249,] 2.4205777275 1.0144126331
## [250,] 0.9407088807 0.5830939925
## [251,] 0.6793767710 0.3510618426
## [252,] 0.4408743237 1.2523870781
## [253,] 0.6239111789 0.5295076217
## [254,] 0.0592695328 2.7011470306
## [255,] 1.1177674290 0.3406709031
## [256,] 0.2210870634 0.5771497479
## [257,] 0.2103651057 2.4776148709
## [258,] 0.1671440213 1.9259777342
## [259,] 0.4169954786 1.0472100899
## [260,] 0.3962758993 0.8680450436
## [261,] 0.2668736730 1.6082230567
## [262,] 4.4852746957 1.0170990317
## [263,] 0.4799617940 0.7988973589
## [264,] 0.4241122099 0.6474433891
## [265,] 0.6917245962 2.2217019167
## [266,] 0.8591947493 1.8917065491
## [267,] 5.9113192913 1.2471933370
## [268,] 1.1255765625 1.7985907881
## [269,] -0.3157086739 1.8941568571
## [270,] 2.7784544918 0.3102226027
## [271,] 1.2063325198 0.6126373582
## [272,] 1.4399171142 0.1349168437
## [273,] -0.2730895806 0.0156819660
## [274,] 0.5343203283 0.4539120960
## [275,] 0.3077090709 2.3919024204
## [276,] 0.4326787517 0.2200733458
## [277,] 1.2006578131 0.0402321974
## [278,] -0.0019677211 0.7765914377
## [279,] -0.2141810425 1.7360617603
## [280,] 0.0524634323 1.5614545106
## [281,] 0.7247896683 -0.0182979891
## [282,] 0.1508135045 -0.1670179228
## [283,] 0.4513130911 0.8629660813
## [284,] 0.1315137442 0.2026400995
## [285,] 0.4444881369 0.5892671446
## [286,] 2.6027980485 1.7295445163
## [287,] 2.4676489504 1.2933967820
## [288,] 0.6443407371 0.8931803676
## [289,] 2.7532926036 0.4497557968
## [290,] 2.9361634578 2.1002687047
## [291,] 0.1792880439 0.7354189957
## [292,] 0.6355277180 1.3108979171

```

```

## [293,] 4.0807984164 0.2820396260
## [294,] 0.6419030249 0.9747147110
## [295,] 5.3479917594 0.0117491896
## [296,] 0.2483976283 1.4615138254
## [297,] 1.0608150474 0.4399911501
## [298,] 0.2232347612 5.9911775081
## [299,] 0.6115206775 0.2240117863
## [300,] -0.0330652704 -0.2390011243
## [301,] 0.7338869228 -0.0726059375
## [302,] -0.0135798338 0.3987529867
## [303,] 0.3230613193 0.6423020202
## [304,] -0.1105057288 1.1570131827
## [305,] 8.6969878415 1.6025729629
## [306,] -0.2151057269 0.6818754883
## [307,] 1.5155050416 0.8639335916
## [308,] 0.4660926269 3.5039813610
## [309,] -0.1498976021 1.2458723044
## [310,] 1.4797903392 0.5526737104
## [311,] 1.7177415556 1.3147956031
## [312,] 0.4950069140 0.5557001206
## [313,] 1.4431666129 0.4964318402
## [314,] 0.1744047821 1.6239414044
## [315,] 1.0125045390 1.0762809544
## [316,] 0.7062755012 -0.0838168903
## [317,] 0.4350853291 0.6076718451
## [318,] 1.9395623508 0.8360707850
## [319,] -0.2935495924 1.4017626396
## [320,] 0.1113165657 2.2927138296
## [321,] 0.3321844803 0.0005376131
## [322,] 2.9696300736 1.5794039238
## [323,] -0.2973833886 1.3746549727
## [324,] 1.4942055642 0.4361908827
## [325,] 0.1170545610 2.2907024186
## [326,] 1.3372850878 0.8766646084
## [327,] 0.3698369256 2.0853779713
## [328,] 0.7025458578 0.7867410495
## [329,] 0.8221148112 1.4890276590
## [330,] 1.5592092489 1.1121825385
## [331,] 0.3773456241 0.1078367386
## [332,] 0.2637890781 0.3337840761
## [333,] 0.4999254268 1.0021468328
## [334,] 0.2299655719 2.0227957087
## [335,] -0.0591069781 0.3990987804
## [336,] 0.0718026346 0.3541165285
## [337,] -0.0843266637 0.3334308206
## [338,] -0.1904807642 0.5771460686
## [339,] -0.0338850089 1.4622552185
## [340,] 0.3885654967 0.5215614967
## [341,] 0.8019414308 0.1735458660
## [342,] 0.7274708433 -0.0063543982
## [343,] -0.0533566051 1.0025166644
## [344,] 4.4595778467 0.4272030937
## [345,] 0.1555066483 0.1535834298
## [346,] 0.7039418437 0.7000253132

```

```

## [347,] 0.1890631378 3.5281681379
## [348,] 0.4962242819 1.9971262675
## [349,] -0.0201536097 0.5469192527
## [350,] 0.0762522803 0.0321813770
## [351,] 0.2668871370 0.3913679770
## [352,] -0.1269988964 0.1766890042
## [353,] 1.4648334737 2.4001831700
## [354,] 0.1865314035 1.5439813826
## [355,] 0.9237245004 0.3167656143
## [356,] 1.0650261799 1.0626648581
## [357,] 0.7739111351 1.8621563095
## [358,] 0.0122124881 1.0805158719
## [359,] 0.4027729861 -0.1351761553
## [360,] 0.2592378035 -0.0707988652
## [361,] 2.8488316062 0.0560793687
## [362,] 0.4663847269 2.5026791312
## [363,] 0.3095378363 1.0235991301
## [364,] 0.7031619127 0.3844017571
## [365,] 2.6421272124 0.5026570328
## [366,] 0.9190350369 -0.2187226801
## [367,] 1.2267337532 2.5630561436
## [368,] 0.3729789433 1.3241324866
## [369,] -0.0303635477 1.5499409569
## [370,] 1.1286443331 2.5136931071
## [371,] -0.0212617749 -0.0952935284
## [372,] 0.3251693867 0.8196515041
## [373,] 0.0221308373 1.1688189432
## [374,] 1.7982571233 0.8540477371
## [375,] 0.7402366778 0.2343305865
## [376,] 0.4192742288 1.6541587919
## [377,] 0.2407404724 -0.0472162378
## [378,] 0.9880477763 1.3121503801
## [379,] 0.2207841546 1.6866830333
## [380,] 0.5700393153 1.1947622797
## [381,] 0.1006215376 0.7957139959
## [382,] 0.2376436965 1.9996450187
## [383,] 1.1334772734 0.7936972605
## [384,] 1.0552842348 0.7678837062
## [385,] 5.3010530890 3.6343273346
## [386,] 0.5176512274 0.5550947234
## [387,] -0.1673919183 0.0332050018
## [388,] 2.9605248642 1.4513985704
## [389,] 1.2497662070 0.1841298827
## [390,] 2.6017903174 1.8712518928
## [391,] 0.1060618988 2.5404867826
## [392,] 1.0296984893 0.0403561262
## [393,] 0.4406431058 0.0555912804
## [394,] 0.0899285198 1.5830537648
## [395,] 0.6739547332 -0.1408562992
## [396,] 0.9132069187 0.0287757299
## [397,] 1.1168749471 -0.1237579487
## [398,] 1.1689181280 0.2459713294
## [399,] 2.5086847108 0.2101944516
## [400,] 0.6409351059 0.3306379224

```

```

## [401,] -0.0578426844 0.6207266691
## [402,] 0.1362304334 0.8913940375
## [403,] 2.9562831744 1.0062481621
## [404,] 2.3836402261 0.2235505515
## [405,] 1.7113661396 0.4192635255
## [406,] -0.1925512506 -0.1199721719
## [407,] 2.0605114909 -0.1938335774
## [408,] 0.0567100379 0.9263328711
## [409,] 0.8769535704 -0.1434537616
## [410,] 0.0901444114 1.4117941652
## [411,] 1.1907485938 0.6470136246
## [412,] 1.9023594175 0.2568758891
## [413,] 0.1764710754 1.3937851203
## [414,] 0.33612220300 0.3818444557
## [415,] 1.5697434765 6.2066255828
## [416,] 0.0291389810 0.5398662246
## [417,] 0.2045069729 -0.3404894479
## [418,] 3.6449391173 1.5983355822
## [419,] -0.0027384374 -0.0513946476
## [420,] 1.9273971084 0.3848345624
## [421,] 0.1021127102 0.0729860312
## [422,] 1.0284256757 1.1940348360
## [423,] -0.1865778832 0.4549548104
## [424,] 1.2689192944 0.2063119103
## [425,] 0.5974152833 1.8347897920
## [426,] 1.8282692889 2.1144628205
## [427,] 0.3388205316 0.9340583315
## [428,] 0.5029935883 0.5674062341
## [429,] 5.2929757399 -0.0939843604
## [430,] 0.2809146112 -0.0604491899
## [431,] 0.3445282704 1.7205434374
## [432,] 2.7544921153 0.7366312261
## [433,] 0.3178557433 0.2472646273
## [434,] 0.1712092450 0.5762744800
## [435,] 0.7999349988 0.7363655336
## [436,] 0.5700839755 0.5138998903
## [437,] 0.6116802871 0.1621859806
## [438,] 1.4545561365 1.0481308397
## [439,] 0.2845999219 1.1122365224
## [440,] 1.1756998551 0.0318192098
## [441,] 2.6177023728 -0.0942628227
## [442,] -0.0066313935 0.1092023780
## [443,] 0.2750676704 1.0311574562
## [444,] 0.8951215790 1.1567612595
## [445,] 4.1468501518 1.1483958325
## [446,] 1.5283339287 2.2403606862
## [447,] 0.0321094750 0.3406540481
## [448,] 4.7801548179 -0.0527598010
## [449,] 0.8629895828 1.0065519679
## [450,] 2.2472975504 0.4280993247
## [451,] 1.2609593749 1.3519228485
## [452,] 0.6641899681 0.9874826468
## [453,] -0.0737281396 0.4058187269
## [454,] -0.0958696352 0.9574503959

```

```

## [455,] 1.4308424800 0.4237619162
## [456,] 1.1017532294 0.5170440421
## [457,] 0.7927140596 0.1327859827
## [458,] 0.7033358604 1.7473087430
## [459,] 2.3911521736 2.5300932750
## [460,] 1.9846302029 0.7696522243
## [461,] -0.2386920478 -0.2641612038
## [462,] 0.9784035296 1.2286089583
## [463,] 1.1599253324 0.3111454836
## [464,] 0.5893832359 0.2907394490
## [465,] 0.5551923476 2.0315248495
## [466,] 0.3323766209 0.4199307548
## [467,] -0.0955876810 0.6448459274
## [468,] 0.5170400703 1.1800228792
## [469,] 1.4174687214 2.0537102107
## [470,] 0.1557836293 0.6922386915
## [471,] 0.6115021381 1.5865767652
## [472,] 6.1485507404 1.1593569997
## [473,] 2.5500665922 0.9790239899
## [474,] 0.2014062490 0.3455404901
## [475,] 0.3562179620 1.6769714051
## [476,] 1.7120762852 -0.1602924596
## [477,] 0.0916839113 -0.3870586103
## [478,] 0.3616205519 1.2064702846
## [479,] -0.0776989413 -0.2435596368
## [480,] -0.3972312821 -0.2759156812
## [481,] 1.2297628461 0.7272910290
## [482,] 3.2512984900 0.9896951836
## [483,] 0.8225763029 0.9279660236
## [484,] 1.1013217714 0.2253178960
## [485,] 0.5001972838 -0.2182103100
## [486,] 0.6776495516 0.8555075225
## [487,] 0.2575048895 1.5744225505
## [488,] 0.0679679533 2.5822467470
## [489,] 0.6729828109 0.0497345569
## [490,] -0.2080074105 4.3256363785
## [491,] 0.4777274426 0.3878872367
## [492,] 0.1054073832 0.0721463775
## [493,] 0.4359063374 1.0951255075
## [494,] 1.5678419275 1.2800703869
## [495,] 1.0781490325 0.6575700738
## [496,] 0.3744344560 1.3092215067
## [497,] 0.5115033332 0.0314110268
## [498,] 0.2274299298 0.2517019798
## [499,] 0.2250982913 0.0500206839
## [500,] 2.2036331086 -0.0124878044
## [501,] 1.1568008488 0.3424346175
## [502,] 0.5627543395 0.3496866665
## [503,] 0.2031174035 -0.0099877746
## [504,] 3.1048925654 0.1571913000
## [505,] 0.2466964737 0.8176263074
## [506,] 1.6513226562 1.8277772599
## [507,] -0.0438572129 0.6034192179
## [508,] 0.3297379004 0.1819200588

```

```

## [509,] 0.7311106796 0.2542143713
## [510,] 0.4747589401 0.3343559385
## [511,] 0.9379642447 0.1308517945
## [512,] 2.1876688682 0.0551752206
## [513,] 0.1803038829 0.7314313770
## [514,] 0.0772461649 1.6940871224
## [515,] 0.8487481427 1.3636125403
## [516,] 0.1865924726 1.2851311543
## [517,] -0.0037414152 0.1589005423
## [518,] 0.3711313906 0.3147246161
## [519,] 0.9801058374 2.9538326922
## [520,] 1.1338103127 0.9053149966
## [521,] 0.3240114219 -0.0777554931
## [522,] -0.0768952494 0.8375407623
## [523,] 0.1107895069 0.0735667399
## [524,] 2.4667578593 -0.0718873082
## [525,] 0.9806811830 -0.1194919001
## [526,] 2.3639665071 1.4483334997
## [527,] -0.0465168877 0.2415515608
## [528,] 0.0251102054 0.8500162517
## [529,] 0.9518685103 0.9066477704
## [530,] 0.2183595116 0.4843306450
## [531,] 0.0941863218 0.1665555606
## [532,] 1.8109321053 0.4063914152
## [533,] 0.4455981062 -0.0177485526
## [534,] 0.3264772453 0.4328919426
## [535,] 0.3077034997 0.0644416523
## [536,] -0.0688221683 0.6075125487
## [537,] 3.5355257250 2.8585750123
## [538,] 0.8582946986 0.3377851678
## [539,] 0.6261533485 0.4110181481
## [540,] 1.5055628479 2.7456281702
## [541,] 1.0694634388 1.3021022528
## [542,] 0.1380202169 2.4926049705
## [543,] 0.5222271352 0.8809823762
## [544,] 1.1134567867 0.5705556769
## [545,] 4.7996937150 -0.2077963304
## [546,] 1.9827982253 0.8722827550
## [547,] 2.4136865446 0.4685467552
## [548,] 0.0519965375 0.6594748346
## [549,] 1.3227742419 0.1179455708
## [550,] 0.7454208216 1.8218545164
## [551,] 2.3406480612 0.5125164012
## [552,] 1.8393758946 0.5196372942
## [553,] 2.2829015134 1.5130495468
## [554,] 0.1959534631 0.6174285634
## [555,] 0.3545317119 0.6147794461
## [556,] 0.9972408560 2.1852305600
## [557,] 0.7604149252 0.2461243577
## [558,] 0.7589704357 0.0394642962
## [559,] 0.4146427428 0.8834818669
## [560,] 3.1087792387 -0.1276141160
## [561,] 0.1653797225 0.0577036042
## [562,] 1.3851719887 0.8130254610

```

```

## [563,] 0.2625944212 0.5068868620
## [564,] 0.2705890140 1.2067295157
## [565,] 0.1658394282 0.8597788350
## [566,] 0.7922887215 0.4323627704
## [567,] 4.5247921355 0.8620504285
## [568,] 0.8862013063 0.3205520242
## [569,] 0.0364490944 1.1370444690
## [570,] 0.0676679904 -0.0960225288
## [571,] 1.9712784400 0.8948683330
## [572,] 1.7139904474 2.1113911971
## [573,] 0.0168895820 -0.1619550296
## [574,] 0.3573036000 0.4407337261
## [575,] 1.5836238843 0.1934340271
## [576,] 0.3946539253 0.5791664100
## [577,] -0.0172048576 0.0850299961
## [578,] -0.2290609066 1.3471373558
## [579,] 0.6463610242 1.3793608926
## [580,] 0.1403042575 0.5733346338
## [581,] 0.8605377684 0.0388022267
## [582,] 0.1078301863 1.1468219477
## [583,] -0.0929140344 0.9970161788
## [584,] 0.0885206797 0.9052805412
## [585,] 0.4399234565 1.6693345101
## [586,] 1.3124964701 0.5132451831
## [587,] 0.2839194026 0.4453892174
## [588,] 0.8675723981 0.9335966380
## [589,] 0.3977068057 1.3354068468
## [590,] 2.3186282648 -0.2467945961
## [591,] 1.2481351676 1.0608988109
## [592,] 0.7677432084 0.7589755133
## [593,] 0.6717932094 0.9368674170
## [594,] 0.2166307064 0.8926084857
## [595,] 2.3366218604 1.1241008486
## [596,] 0.6732839363 0.7596100031
## [597,] 0.2294644029 1.2880913788
## [598,] 0.2713457362 1.3778262569
## [599,] 2.0987281496 4.5961130356
## [600,] 2.7797702974 0.1399586866
## [601,] 0.1101344623 2.2044467354
## [602,] 2.3967429266 1.6571849312
## [603,] 0.0266293322 0.2961372058
## [604,] 0.2602882568 0.9443086668
## [605,] 0.2124999603 0.3970192673
## [606,] 0.6463753948 1.1373860079
## [607,] 0.0266689769 0.1345446508
## [608,] 1.1827618752 0.0231499566
## [609,] 1.0696795456 0.5840738432
## [610,] 1.8172174258 2.0389732959
## [611,] 0.2764405566 2.3159959620
## [612,] -0.1785106967 0.3178408815
## [613,] 0.6571034602 1.5663069473
## [614,] 0.1949250336 2.5307471826
## [615,] 1.2799778016 1.0460875566
## [616,] 1.1322949170 1.0318744374

```

```

## [617,] 0.1882506740 0.5441353589
## [618,] 0.1911643683 0.2756697316
## [619,] 1.0134631505 2.4216000108
## [620,] 0.5211614397 0.7932546788
## [621,] 2.0930358640 2.7133506633
## [622,] 0.4935670622 0.0488777943
## [623,] 1.5603900201 0.3847147510
## [624,] 1.8225303179 1.0894841042
## [625,] 1.3791856647 1.0614148993
## [626,] 1.6769487057 0.8120630927
## [627,] 1.9140435523 1.0031501825
## [628,] 0.0071696014 1.2961676407
## [629,] 0.3289915109 0.5920536941
## [630,] 0.2793368925 0.4085651825
## [631,] 0.0785848203 0.8371622978
## [632,] 0.1844240110 1.3349467877
## [633,] 0.2991347499 0.2479551902
## [634,] 0.5713244471 1.8097477835
## [635,] 0.2676499044 -0.3776361502
## [636,] 0.6795743456 0.0056801969
## [637,] 3.7202029190 0.5767440835
## [638,] 0.0314561386 1.4746433851
## [639,] -0.2903938975 0.3229736488
## [640,] 2.4178224782 1.5586375459
## [641,] 0.1317730423 0.1065256900
## [642,] -0.3750550785 1.3948625182
## [643,] 0.2965608256 0.2606011524
## [644,] 6.6245793281 2.3629328959
## [645,] 0.9033182551 2.7673051548
## [646,] 0.1368649719 0.0788974979
## [647,] 2.3999280557 0.7953503646
## [648,] 0.0010452977 0.4572379746
## [649,] 0.4010135181 -0.0372768870
## [650,] 0.3950881366 0.2542247307
## [651,] 0.4916879407 -0.0111072185
## [652,] 1.0642961345 0.6753969721
## [653,] 0.2903521342 0.2953008179
## [654,] 0.3180041161 2.7023875943
## [655,] 0.3590690859 1.1301227342
## [656,] 1.7166184771 0.5478630321
## [657,] 1.0502976007 0.7465875204
## [658,] 1.1629428267 1.0253411262
## [659,] 3.5950459163 0.3690275047
## [660,] 1.9468584992 2.2666671906
## [661,] 0.5634263294 0.8175130202
## [662,] 1.1752715315 0.3220477289
## [663,] 0.1242360654 0.4023725680
## [664,] -0.0569879325 3.9712678659
## [665,] 0.2494507958 1.7605380656
## [666,] 0.7949912947 4.0813187307
## [667,] 3.8715164531 -0.1430395044
## [668,] 0.5753068948 1.7368123190
## [669,] 1.5478342478 0.7763785349
## [670,] 2.9893885475 0.1129912705

```

```

## [671,] 0.3629847380 -0.0771921501
## [672,] 4.5653585047  0.6358006734
## [673,] 0.6981979410  0.8262173327
## [674,] 0.5453016396  0.6309554245
## [675,] -0.1452472163 -0.0371787605
## [676,] 0.1332270348  0.4062730165
## [677,] 0.0247023345  3.9152559687
## [678,] 2.5744720686  1.9250197252
## [679,] -0.1835112040 3.4987127108
## [680,] 1.2149589387  0.1889220442
## [681,] 3.8268222954  0.2230907044
## [682,] 0.2873396616  0.1100738599
## [683,] 0.5331421351  0.1398947574
## [684,] 1.6249448189  3.9772513018
## [685,] 1.5374347229  0.7059802701
## [686,] 2.0579333628 -0.2291199386
## [687,] 0.3502818325  0.2418241188
## [688,] 0.3929788484  0.1724535424
## [689,] -0.1616699061 0.2515026242
## [690,] -0.2822339128 0.6410380774
## [691,] 0.6273329794  0.7735798478
## [692,] 2.3008032086  0.5811865725
## [693,] 0.6046163923  0.4114775671
## [694,] 0.3008335636  0.4566640939
## [695,] 1.6319715099  0.6224254073
## [696,] 0.7522669660  0.0043074982
## [697,] 0.1852270186  1.0650155618
## [698,] 0.3625445148  5.0042638421
## [699,] 0.1139868566 -0.1657997571
## [700,] 3.9281484212  0.2255257120
## [701,] 2.2897247488  2.3015424130
## [702,] 0.8450809740  0.5041646826
## [703,] 0.0160703803  0.7832854865
## [704,] 1.7400499186  0.8375862753
## [705,] 1.4039648699  2.3175507358
## [706,] 0.7579464744  0.6697553070
## [707,] 0.2572674628 -0.1503714781
## [708,] 0.4683679334  0.8702513936
## [709,] 0.5187495248 -0.1597870110
## [710,] 1.3550237618  1.4059775437
## [711,] 0.8198853172  1.3943656806
## [712,] 0.7597942883 -0.3192589262
## [713,] 0.9187246141 -0.1515415601
## [714,] 2.1645609605  0.3312275690
## [715,] 0.2137460718  2.6929602731
## [716,] 0.0745203842  1.8938129936
## [717,] 0.1537318700  0.3382114360
## [718,] 2.5199634857  5.9554888310
## [719,] 0.6912647652  2.8532335062
## [720,] 0.2471032480  2.0730368952
## [721,] 0.9980330648  4.6099522736
## [722,] 5.1134780449  0.1108686762
## [723,] 1.4737493445  2.2529851304
## [724,] 0.1213178735  0.5873099244

```

```

## [725,] 1.7387266209 0.7598362511
## [726,] 0.7249291482 0.1488957900
## [727,] 4.4936004237 -0.1809240598
## [728,] 5.6735725569 -0.0311763648
## [729,] 1.7155044244 0.5464332754
## [730,] 0.3867160892 0.2287102036
## [731,] 1.1962286813 1.7893842211
## [732,] 1.3920299141 0.4305666815
## [733,] 0.4677792572 0.9367591977
## [734,] 1.9714110652 3.6038977156
## [735,] 2.6003436669 0.1851730194
## [736,] 0.5184082063 2.6543100641
## [737,] -0.3648207849 4.0700872249
## [738,] -0.1216231523 0.8325239236
## [739,] 2.7339942556 1.5532659331
## [740,] 0.5172498067 1.7330449641
## [741,] -0.0003376775 0.7482564185
## [742,] 0.8011616452 1.4825944833
## [743,] 7.8357682263 0.8436420391
## [744,] -0.2256085829 0.3116667056
## [745,] -0.1062348793 1.9664456486
## [746,] 0.1599692004 0.0988048256
## [747,] 1.3942931041 1.1067428246
## [748,] 0.7385026274 0.9309186240
## [749,] 1.6609447034 1.9487453155
## [750,] 0.7758565579 0.1513335696
## [751,] 0.1609016356 1.1179604410
## [752,] 0.5594622914 0.6609639483
## [753,] 1.6684280817 0.0667401751
## [754,] 0.2300436156 0.2849570582
## [755,] 2.7983391865 -0.1407938964
## [756,] -0.0201695284 0.3410272407
## [757,] 5.5500799762 7.8787584810
## [758,] 1.3934495691 0.4641558898
## [759,] 1.0104413663 0.7312670602
## [760,] 0.4004005205 0.0476844565
## [761,] 0.5804646275 -0.0368435731
## [762,] 0.7882250737 4.1142344323
## [763,] 0.7412341394 1.1262409054
## [764,] 1.2603495823 0.9584728153
## [765,] 1.7765847749 0.2478243914
## [766,] 2.0466185101 1.0834750907
## [767,] 1.5839966670 1.1116067585
## [768,] 0.5904385235 1.3367648273
## [769,] 0.1430518769 0.5097724352
## [770,] 1.1460350009 1.4939889571
## [771,] 2.3356048644 3.2669510300
## [772,] 0.1697862469 3.7087591447
## [773,] 2.5194884820 0.5115456610
## [774,] 0.5043874485 1.7769986930
## [775,] 0.6942194224 1.2119685770
## [776,] 4.3868993774 2.7149996858
## [777,] -0.1146588517 0.5850555507
## [778,] 0.6906289198 0.6662917460

```

```

## [779,] 0.1912873338 -0.1386950921
## [780,] 0.6828616317 -0.0981459010
## [781,] 2.1545199995 2.4433499994
## [782,] 0.7488409157 -0.0043126207
## [783,] 0.3692088310 -0.0446186675
## [784,] 0.8887828271 1.0494857932
## [785,] 0.4843853750 0.9729544076
## [786,] 0.2072145290 0.0002243728
## [787,] 0.1184750004 1.2533360684
## [788,] 1.4495403037 1.9700902401
## [789,] 3.7083834844 0.6809169561
## [790,] 0.2101106801 4.8119220444
## [791,] -0.5495556541 0.6792072815
## [792,] 0.1515994626 0.1195106940
## [793,] 0.5024463397 -0.0930420871
## [794,] 0.5883033591 -0.0679608372
## [795,] 0.5476885508 1.4207152307
## [796,] 2.0198225568 0.7778500811
## [797,] 0.7529105090 3.1391582789
## [798,] 0.1337430805 4.3483400687
## [799,] 0.6930093079 1.2845687032
## [800,] 0.4165549220 -0.1714415770
## [801,] 2.5526500908 6.2681246250
## [802,] 1.2554137691 0.0688057390
## [803,] 3.6921153767 0.8085458603
## [804,] 1.5621003197 0.8153525063
## [805,] -0.3642386877 2.2347343350
## [806,] 2.8840789260 1.1670935575
## [807,] -0.1088884273 2.5827802416
## [808,] 0.9518327289 0.4126690368
## [809,] 2.2249510344 -0.0431192294
## [810,] 0.3582156386 1.5285015849
## [811,] 0.4228420602 0.4984376218
## [812,] 0.4655318736 1.5962481041
## [813,] 0.4512975209 -0.0167855810
## [814,] 0.7159502870 6.3769239289
## [815,] 0.6132769989 0.9555113992
## [816,] 0.1720965968 0.5193339134
## [817,] -0.0551795511 0.5771470536
## [818,] 0.2431407728 1.7854977138
## [819,] 2.8668396181 0.4560537748
## [820,] 3.0918504602 1.3578182109
## [821,] 0.2379796713 0.7234666514
## [822,] 2.9232858634 0.2660200030
## [823,] -0.0033866007 0.1402083996
## [824,] 0.5448602217 1.5267018623
## [825,] 1.1880803622 1.5749235884
## [826,] 0.4736263905 1.0888293340
## [827,] 2.8147957238 0.1417323328
## [828,] 1.2280908297 4.1910021600
## [829,] 0.6774240199 0.0137994236
## [830,] 0.8157577032 3.1111852473
## [831,] 0.9203440518 0.2426481674
## [832,] 1.1872726245 1.4740046426

```

```

## [833,] 2.5968644831 1.4106942272
## [834,] 0.9042953961 2.3105416487
## [835,] 2.4350829022 2.4900622612
## [836,] 1.2843975490 1.3811558193
## [837,] 2.2652710043 1.6275806412
## [838,] 1.8563670937 0.6405276773
## [839,] -0.4232175742 -0.0830064166
## [840,] 1.3315802241 1.7454616551
## [841,] 0.7857661733 0.4040103936
## [842,] 2.0987861989 0.0451438600
## [843,] 4.1140851862 0.2409123357
## [844,] 1.9563767477 0.3576859800
## [845,] 0.6018839523 2.8241755521
## [846,] 0.4334801066 1.4951933301
## [847,] 2.3115800447 1.6694747417
## [848,] -0.3348680893 1.0789207928
## [849,] -0.2137767533 0.3038440598
## [850,] 0.5820566530 0.1438098887
## [851,] -0.0717572370 0.0591003536
## [852,] 0.4678731282 0.7060614423
## [853,] 0.2339836184 3.1264622145
## [854,] 0.1899817013 1.9635414639
## [855,] 0.2791050347 -0.2643921719
## [856,] 2.8163381290 4.4449135143
## [857,] 6.9277869903 0.1881722783
## [858,] 0.8392095699 0.1318342478
## [859,] 0.9225951942 0.6183226084
## [860,] 1.8573681225 1.0198318197
## [861,] 0.0874798733 3.5717851062
## [862,] 0.1668554037 5.9730789499
## [863,] -0.1215657037 0.1773018711
## [864,] 1.7518234688 0.6865323434
## [865,] -0.1342819183 0.9411054616
## [866,] 0.2433050029 1.0042359314
## [867,] -0.1785358663 0.3839728301
## [868,] 0.3366616737 1.3976239585
## [869,] 0.9858872807 2.3030092380
## [870,] 1.6203346974 0.1697183450
## [871,] 0.2866851021 0.3932586761
## [872,] 0.2374497695 0.0771598494
## [873,] 0.3882708827 -0.3012221327
## [874,] 1.9178782397 1.6367319400
## [875,] 0.6327687039 3.8183180156
## [876,] 0.4061527062 1.1496686551
## [877,] 1.5916047506 1.0733642741
## [878,] 4.1951740249 1.8737447556
## [879,] -0.0070984454 0.8576267876
## [880,] 1.8534366274 -0.2069620009
## [881,] 0.1955047092 0.2208145118
## [882,] 1.8375121970 -0.3732737137
## [883,] 0.9070099236 0.7417938232
## [884,] 0.8328324726 0.7915029234
## [885,] 0.7760763827 0.2874212387
## [886,] -0.0024996618 1.2880019676

```

```

## [887,] -0.1862930757 0.4173424965
## [888,] 1.3965799160 0.0438827909
## [889,] 1.9640195083 0.6494387811
## [890,] 3.7924016802 0.0680494980
## [891,] 0.0603567307 -0.0046258604
## [892,] 1.0604762774 0.4503681190
## [893,] 2.2142447766 1.4426482227
## [894,] 0.0675805659 0.5260774076
## [895,] 1.5390354823 -0.1157364516
## [896,] -0.1057935712 0.0207100142
## [897,] 0.5931437008 -0.1537186487
## [898,] 0.0002096311 0.6248299318
## [899,] 0.2842339556 1.9417446687
## [900,] 1.8637032008 0.9752740883
## [901,] 0.0067698127 -0.3371099452
## [902,] 1.5006155088 0.9293687705
## [903,] 2.9589659186 1.2163120408
## [904,] 0.5013863382 2.7056586488
## [905,] 0.8238953942 1.2611911587
## [906,] 3.5145321702 -0.2258091631
## [907,] 0.7263835996 0.7902281635
## [908,] 0.2236849254 3.1690445699
## [909,] 1.2835129236 2.0071443182
## [910,] 0.6917973616 0.8108571759
## [911,] 1.9182321361 1.8290396951
## [912,] 2.8544128997 1.1583529171
## [913,] 0.0297216488 0.6383109127
## [914,] 0.9222160087 1.0055139803
## [915,] 1.9223263051 5.5766796613
## [916,] 0.2312632900 0.0693503517
## [917,] 1.0428190254 1.8436476618
## [918,] 0.2269889700 0.3022813909
## [919,] 2.3433671888 0.1671304750
## [920,] 1.8098442114 0.5305250750
## [921,] 6.9195411539 4.2780629297
## [922,] 0.8731111498 1.5692571316
## [923,] 3.5335681409 0.7410198157
## [924,] 1.0303509560 3.9349682178
## [925,] 3.2454617288 0.8659436772
## [926,] 7.3553100974 0.9607930677
## [927,] 0.3001208267 1.2675039856
## [928,] -0.0668656544 0.5443620330
## [929,] 0.6504754400 0.4739297901
## [930,] 0.4809514294 0.3198208570
## [931,] 0.8800451217 0.0867914185
## [932,] 2.2913916361 1.4472495601
## [933,] 0.1805504333 -0.4725472990
## [934,] 2.3495058573 0.4653249307
## [935,] 1.3892671023 1.3148407500
## [936,] 0.2788890675 1.0820305228
## [937,] 1.8033983348 0.1883833830
## [938,] 0.0079497760 1.6642325733
## [939,] 0.5511736704 1.0468941090
## [940,] 1.4376079876 1.3939092289

```

```

## [941,] 2.9493374946 0.3492696050
## [942,] 0.9993973857 0.6748301981
## [943,] 1.5166762436 1.8864150943
## [944,] 0.6490804232 0.2656213521
## [945,] 1.0032541020 0.2677740596
## [946,] -0.1353965089 0.2857317859
## [947,] 0.8706028812 0.0577610756
## [948,] 1.1738915726 0.9085548299
## [949,] 1.8713057288 0.0893793784
## [950,] 1.8667935572 -0.0991048057
## [951,] 1.2548242144 0.2684425510
## [952,] 0.9713044765 1.2480070366
## [953,] 4.2393405961 2.5027119971
## [954,] 1.9170965307 0.6791965685
## [955,] -0.3590090757 0.4652266675
## [956,] 1.7080753189 1.7730108596
## [957,] 2.4342045300 1.5288030815
## [958,] 1.8251030552 0.6058460056
## [959,] 0.3384721472 0.2314507889
## [960,] 1.0481031805 1.0466156215
## [961,] -0.3658383250 1.2129115215
## [962,] 0.9873396013 1.5211494807
## [963,] 0.6473909207 1.3106326778
## [964,] 0.7016239401 1.3735706484
## [965,] 0.9872989577 0.3894999034
## [966,] 1.5484615657 0.4099288717
## [967,] 0.4502865976 0.8046797286
## [968,] 2.0168638223 0.8845153292
## [969,] 0.0901030067 0.8333548698
## [970,] 1.4053201142 0.3212008682
## [971,] 0.1822862653 0.1572326314
## [972,] 2.6939358239 1.5415717245
## [973,] 0.1918812322 1.7760762807
## [974,] 1.4358316196 1.8734611074
## [975,] 0.1670973430 1.0715367325
## [976,] 0.1839362888 0.4538172181
## [977,] -0.0145387437 1.4410911859
## [978,] 2.0196129330 1.0150130051
## [979,] 0.9400518776 1.5802535840
## [980,] 0.9366258437 0.7319810499
## [981,] 5.3419854392 0.6696570057
## [982,] 1.0790489904 -0.2707122798
## [983,] 0.4145218409 0.6202894789
## [984,] 8.8778032103 1.6128650542
## [985,] 0.2565013597 1.9068512397
## [986,] 0.7892864791 0.7879884305
## [987,] 2.2111125187 1.3751906328
## [988,] 0.0454942532 0.7388394754
## [989,] 0.0799471643 4.8737951994
## [990,] 1.6262233471 1.3093783308
## [991,] 1.3281727009 0.8331530439
## [992,] 9.5808232331 3.7953715303
## [993,] 1.2656896978 0.9903900759
## [994,] 1.7795851030 1.3842533867

```

```

## [995,] 0.7394181605 -0.1563796618
## [996,] 0.7541343388  0.6783942408
## [997,] 0.7223155833  1.4101979594
## [998,] 1.0414178697  3.1160648591
## [999,] 2.0477416975  0.4397119648
##
## $model.matrix
##   (Intercept) avlength avcondition   T_av  O2_sat_av    Con_av COD_av NH4._av
## 1           1 46.26316  0.7032430 11.114   81.286 740.7140 13.333  0.158
## 2           1 38.30000  0.6196317 10.440   65.400 609.6000 1.400  0.774
## 3           1 47.20000  0.7209293 12.858   75.333 434.7500 25.917  2.251
## 4           1 33.60000  0.7279046 13.086   72.857 949.0000 25.000  5.000
## 5           1 33.30769  0.6910252 11.750   96.833 896.1670 14.000  0.303
## 6           1 35.05263  0.7161573 13.557   84.571 340.7140 29.000  0.252
## 7           1 35.53333  0.7532778 11.750   88.417 716.3330 16.583  0.393
## 9           1 41.66667  0.8590551 12.008   87.000 800.3330 21.917  0.468
## 11          1 39.89474  0.6943120 13.550   63.167 527.6670 45.500  3.233
## 12          1 32.90909  0.6629259 14.957   65.857 1089.8570 50.500  5.365
## 13          1 39.88235  0.7324076 14.486   90.429 771.7143 11.333  0.668
## 14          1 38.42857  0.7578120 11.983   77.667 472.3330 37.167  2.367
## 15          1 34.23077  0.7642545 11.577   85.308 591.4620 24.667  0.260
## 16          1 43.61111  0.6500428 12.443   87.857 462.5710 37.167  0.210
## 17          1 40.16667  0.7486984 11.425   73.250 470.3330 20.000  2.589
## 18          1 37.43750  0.9549238 16.214   61.000 422.4290 35.833  2.417
## 19          1 41.47059  0.6295888  9.317   94.900 812.8330 7.500  0.103
## 20          1 28.00000  0.7382850 12.957   85.571 851.2860 15.833  0.170
## 21          1 37.84211  0.7477438 15.000   85.333 673.1670 19.500  0.635
## 22          1 42.00000  0.6865490 10.475   73.833 255.8330 24.727  0.527
## 23          1 36.50000  0.7425513 10.050   80.000 138.6670 37.167  0.290
## 24          1 43.58333  0.8243429 11.773   66.091 593.0910 34.727  0.806
## 26          1 31.72222  0.8809334 12.167   80.333 897.4170 16.417  0.409
## 28          1 40.31579  0.7644699 13.433   99.667 801.0000 20.909  0.354
## 29          1 39.25000  0.8383703 14.133   87.667 669.6670 14.000  0.227
## 30          1 42.37500  0.7907723 13.542   48.833 542.4170 42.333  2.261
## 31          1 42.00000  0.8148913 12.867   70.333 447.3330 29.333  0.680
## 32          1 38.87500  0.6351264 13.186   91.857 617.5710 19.333  0.362
## 33          1 37.31579  0.7512399 15.233   84.000 539.3330 13.667  0.325
## 34          1 38.73684  0.6217274 12.050   92.583 659.8330 14.750  0.336
## 35          1 37.85714  0.8194431 11.175   91.375 687.3750 26.000  0.395
## 36          1 32.88889  0.6862546 13.700   88.833 755.5000 26.167  1.260
## 38          1 34.65000  0.6616806 13.633   77.500 667.0000 20.333  0.695
## 39          1 33.25000  0.7554143 11.333   43.750 848.3330 35.750  2.542
## 40          1 36.75000  0.6487052 12.900   71.400 635.0000 16.400  2.208
## 41          1 36.35000  0.8265861 15.100   94.000 716.3330 15.167  0.165
## 42          1 35.15789  0.7600249 13.786   89.571 705.7140 18.167  0.880
##
##   Nt_av pool_riffle1 meander1 netcen updist
## 1 8.917000          -1      -1 65212.97 67745.125
## 2 4.780000           1       1 50877.11 52437.119
## 3 8.925000           1      -1 38651.53 32574.449
## 4 9.067000          -1      -1 63911.70 65226.644
## 5 5.167000           1      -1 64168.17 67952.655
## 6 1.617000           1       1 45262.05 45780.074
## 7 2.775000           1       1 72386.11 76509.324
## 9 6.083000           1      -1 47724.46 49932.683

```

```

## 11 5.750000      1      1 49875.30 52217.733
## 12 16.100000     -1     -1 61880.37 26695.488
## 13 6.533000      1      1 60618.70 25511.682
## 14 7.000000      1      1 56056.62 15064.968
## 15 2.608000     -1      1 63687.75 67470.687
## 16 1.730000     -1     -1 68548.11 72561.660
## 17 10.617000     -1     -1 45271.82 39387.485
## 18 5.450000      1     -1 44142.92 15837.759
## 19 5.358361     -1     -1 64632.42 67396.486
## 20 4.583000      1     -1 72865.43 76898.411
## 21 5.067000     -1      1 58440.64 21751.460
## 22 2.164000      1      1 47879.02 44196.470
## 23 1.372000      1      1 53511.26 49989.625
## 24 4.891000      1     -1 37413.39 35027.425
## 26 5.242000      1      1 59347.24 62693.461
## 28 4.636000      1     -1 45740.16 46890.918
## 29 7.550000     -1     -1 73590.70 39137.994
## 30 3.317000      1      1 45131.08 29684.138
## 31 3.283000      1      1 43713.21 2368.891
## 32 4.767000     -1     -1 55885.32 18797.654
## 33 3.683000      1      1 63398.00 26850.462
## 34 8.050000     -1      1 65158.98 30465.362
## 35 4.317000     -1     -1 59901.23 62281.614
## 36 5.567000     -1      1 63856.37 66416.408
## 38 7.033000      1      1 53189.12 16286.394
## 39 5.017000      1      1 63663.04 23736.389
## 40 3.243000      1      1 60384.21 20784.664
## 41 2.550000     -1     -1 60481.19 20943.659
## 42 3.450000      1      1 64836.74 25423.656
##
## $terms
## meandist_bray ~ avlength + avcondition + T_av + O2_sat_av + Con_av +
## COD_av + NH4._av + Nt_av + pool_riffle + meander + netcen +
## updist
## attr(,"variables")
## list(meandist_bray, avlength, avcondition, T_av, O2_sat_av, Con_av,
## COD_av, NH4._av, Nt_av, pool_riffle, meander, netcen, updist)
## attr(,"factors")
##          avlength avcondition T_av O2_sat_av Con_av COD_av NH4._av Nt_av
## meandist_bray      0        0    0        0    0        0    0        0
## avlength         1        0    0        0    0        0    0        0
## avcondition       0        1    0        0    0        0    0        0
## T_av             0        0    1        0    0        0    0        0
## O2_sat_av        0        0    0        1    0        0    0        0
## Con_av           0        0    0        0    1        0    0        0
## COD_av           0        0    0        0    0        1    0        0
## NH4._av          0        0    0        0    0        0    1        0
## Nt_av            0        0    0        0    0        0    0        1
## pool_riffle      0        0    0        0    0        0    0        0
## meander          0        0    0        0    0        0    0        0
## netcen           0        0    0        0    0        0    0        0
## updist           0        0    0        0    0        0    0        0
##          pool_riffle meander netcen updist
## meandist_bray      0        0    0        0

```

```

## avlength          0      0      0      0
## avcondition      0      0      0      0
## T_av             0      0      0      0
## O2_sat_av        0      0      0      0
## Con_av           0      0      0      0
## COD_av           0      0      0      0
## NH4._av          0      0      0      0
## Nt_av            0      0      0      0
## pool_riffle      1      0      0      0
## meander          0      1      0      0
## netcen           0      0      1      0
## updist           0      0      0      1
## attr("term.labels")
## [1] "avlength"     "avcondition"   "T_av"       "O2_sat_av"    "Con_av"
## [6] "COD_av"        "NH4._av"       "Nt_av"      "pool_riffle"   "meander"
## [11] "netcen"        "updist"
## attr("order")
## [1] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
## attr("intercept")
## [1] 1
## attr("response")
## [1] 1
## attr(".Environment")
## <environment: R_GlobalEnv>
##
## attr("class")
## [1] "adonis"

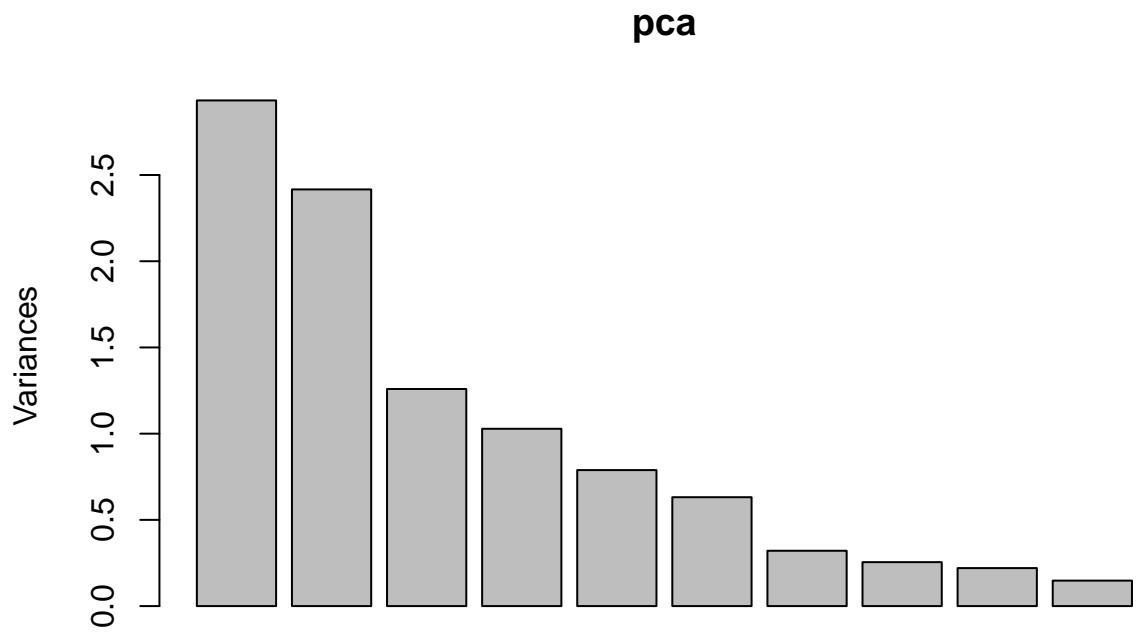
# environmental variables
env_select <- environment2[,c("T_av", "O2_sat_av", "Con_av", "COD_av", "NH4._av", "Nt_av", "pool_riffle")]
env_select$pool_riffle <- as.numeric(env_select$pool_riffle)
env_select$meander <- as.numeric(env_select$meander)

pca <- prcomp(env_select, scale.=T)
summary(pca)

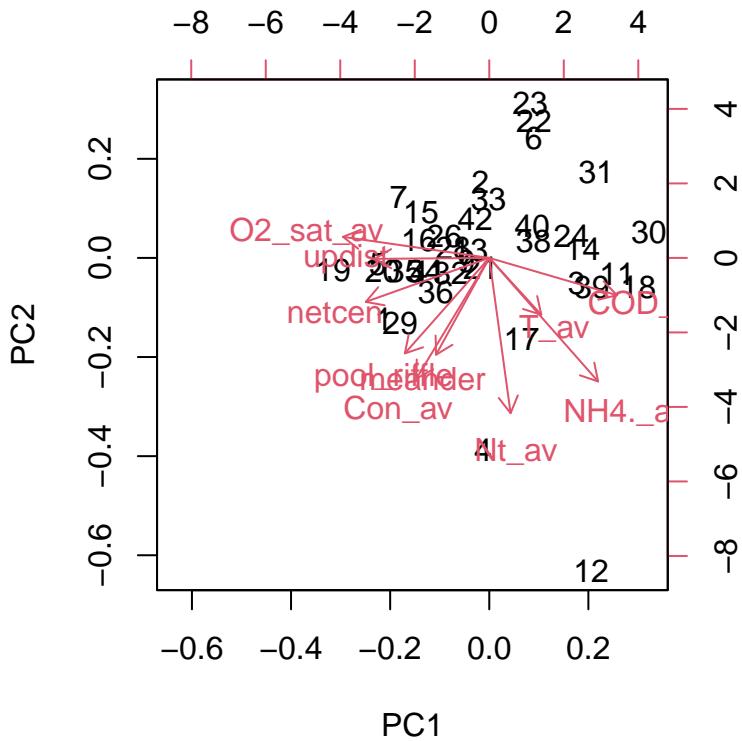
## Importance of components:
##              PC1      PC2      PC3      PC4      PC5      PC6      PC7
## Standard deviation 1.7124 1.5545 1.1221 1.0140 0.88807 0.79463 0.56647
## Proportion of Variance 0.2933 0.2416 0.1259 0.1028 0.07887 0.06314 0.03209
## Cumulative Proportion 0.2933 0.5349 0.6608 0.7636 0.84248 0.90563 0.93771
##                  PC8      PC9      PC10
## Standard deviation 0.50483 0.46939 0.38429
## Proportion of Variance 0.02549 0.02203 0.01477
## Cumulative Proportion 0.96320 0.98523 1.00000

plot(pca)

```



```
biplot(pca)
```



```

mod0 <- dbrda(meandist_bray ~ 1, env_select) # Model with intercept only #edit_PH
mod1 <- dbrda(meandist_bray ~ ., env_select) # Model with all explanatory variables #edit_PH
step.res <- ordiR2step(mod0, mod1, direction = "both", perm.max = 200)

```

```

## Step: R2.adj= 0
## Call: meandist_bray ~ 1
##
##          R2.adjusted
## <All variables> 0.0898822750
## + Con_av         0.0492715387
## + NH4._av        0.0376899022
## + Nt_av          0.0353578268
## + COD_av         0.0097867139
## + updist         0.0092890919
## + pool_riffle   0.0070398050
## + netcen         0.0034499960
## + O2_sat_av     0.0031240320
## <none>          0.0000000000
## + T_av           -0.0005031246
## + meander        -0.0037253892
##
##          Df      AIC      F Pr(>F)
## + Con_av    1 17.228 2.8657  0.004 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Step: R2.adj= 0.04927154
## Call: meandist_bray ~ Con_av
##
##          R2.adjusted
## <All variables> 0.08988227
## + COD_av         0.08426096
## + NH4._av        0.07058808
## + updist         0.06800179
## + O2_sat_av     0.06266812
## + netcen         0.05455352
## + meander        0.05428744
## + Nt_av          0.05273614
## <none>          0.04927154
## + pool_riffle   0.04923534
## + T_av           0.04694754
##
##          Df      AIC      F Pr(>F)
## + COD_av    1 16.768 2.3373  0.002 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Step: R2.adj= 0.08426096
## Call: meandist_bray ~ Con_av + COD_av
##
##          R2.adjusted
## + updist         0.09961037
## + meander        0.09248673

```

```

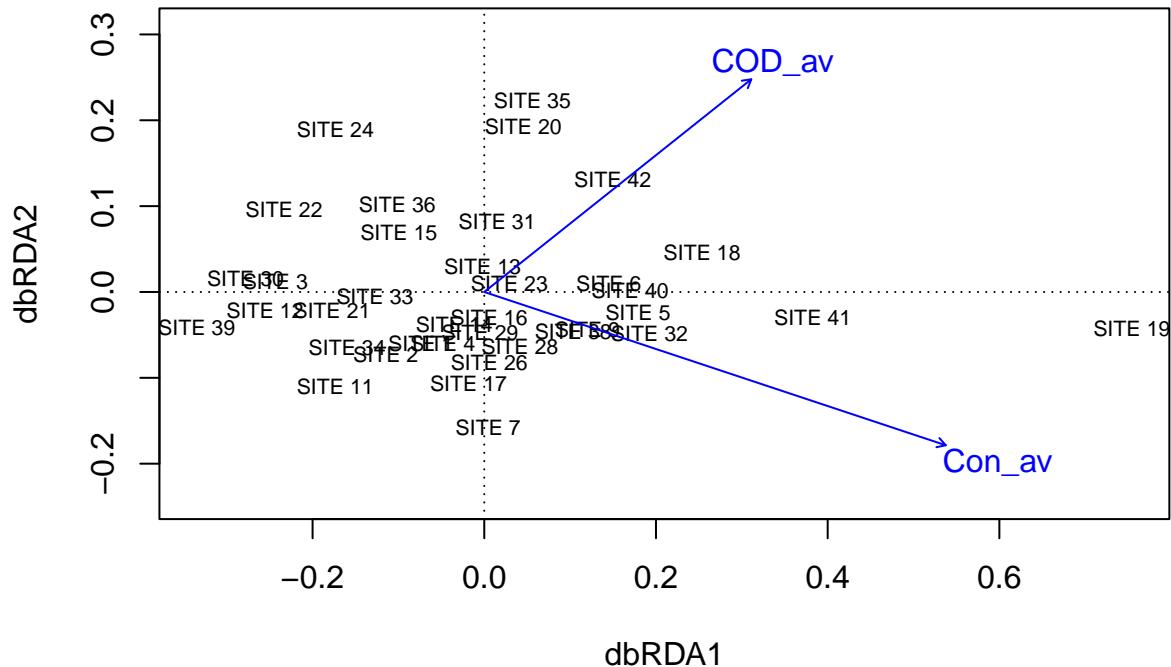
## <All variables> 0.08988227
## + netcen          0.08626581
## + pool_riffle    0.08559576
## <none>           0.08426096
## + T_av            0.08115910
## + O2_sat_av      0.08092067
## + Nt_av           0.07979657
## + NH4._av         0.07591794

step.res$anova # Summary table

##              R2.adj Df     AIC      F Pr(>F)
## + Con_av      0.049272 1 17.228 2.8657  0.004 **
## + COD_av      0.084261 1 16.768 2.3373  0.002 **
## <All variables> 0.089882
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

spe.rda <- dbrda(meandist_bray ~ Con_av + COD_av, env_select)
plot(spe.rda, scaling = 1) # it is for technical reasons not possible to plot both site and species scores

```



```
summary(spe.rda)
```

```
##
```

```

## Call:
## dbrda(formula = meandist_bray ~ Con_av + COD_av, data = env_select)
##
## Partitioning of squared Unknown distance:
##           Inertia Proportion
## Total      1.5898    1.0000
## Constrained 0.2148    0.1351
## Unconstrained 1.3750    0.8649
##
## Eigenvalues, and their contribution to the squared Unknown distance
##
## Importance of components:
##          dbRDA1   dbRDA2     MDS1     MDS2     MDS3     MDS4     MDS5
## Eigenvalue      0.1863  0.02858  0.1972  0.15873  0.1207  0.08661  0.07076
## Proportion Explained 0.1172  0.01798  0.1240  0.09984  0.0759  0.05447  0.04451
## Cumulative Proportion     NA      NA      NA      NA      NA      NA      NA
##                           MDS6     MDS7     MDS8     MDS9     MDS10    MDS11    MDS12
## Eigenvalue      0.06231  0.04802  0.04613  0.04387  0.04231  0.03826  0.03703
## Proportion Explained 0.03919  0.03021  0.02901  0.02760  0.02661  0.02406  0.02329
## Cumulative Proportion     NA      NA      NA      NA      NA      NA      NA
##                           MDS13    MDS14    MDS15    MDS16    MDS17    MDS18    MDS19
## Eigenvalue      0.03557  0.03355  0.03200  0.02808  0.02797  0.02575  0.02487
## Proportion Explained 0.02237  0.02110  0.02013  0.01766  0.01759  0.01620  0.01564
## Cumulative Proportion     NA      NA      NA      NA      NA      NA      NA
##                           MDS20    MDS21    MDS22    MDS23    MDS24    MDS25    MDS26
## Eigenvalue      0.02377  0.02238  0.02182  0.02104  0.01990  0.01880  0.01782
## Proportion Explained 0.01495  0.01408  0.01372  0.01323  0.01252  0.01183  0.01121
## Cumulative Proportion     NA      NA      NA      NA      NA      NA      NA
##                           MDS27    MDS28    MDS29    MDS30    MDS31    MDS32
## Eigenvalue      0.01719  0.01622  0.011778 0.010499 0.007903 0.006958
## Proportion Explained 0.01081  0.01020  0.007408 0.006604 0.004971 0.004376
## Cumulative Proportion     NA      NA      NA      NA      NA      NA
##                           MDS33    iMDS1
## Eigenvalue      0.005670 -0.006426
## Proportion Explained 0.003566  0.004042
## Cumulative Proportion     NA      NA
##
## Accumulated constrained eigenvalues
## Importance of components:
##          dbRDA1   dbRDA2
## Eigenvalue      0.1863  0.02858
## Proportion Explained 0.8670  0.13304
## Cumulative Proportion 0.8670  1.00000
##
## Scaling 2 for species and site scores
## * Species are scaled proportional to eigenvalues
## * Sites are unscaled: weighted dispersion equal on all dimensions
## * General scaling constant of scores: 2.750505
##
## Site scores (weighted sums of species scores)
##
##          dbRDA1   dbRDA2     MDS1     MDS2     MDS3     MDS4
## SITE 1 -0.215744 -0.44381  0.01302  0.31819 -0.28116 -0.178171

```

```

## SITE 11 -0.507248 -0.82144 -0.09719 -0.28198 -0.04679 0.342258
## SITE 12 -0.746029 -0.15775 0.31672 0.25334 -0.08234 -0.151368
## SITE 13 -0.005847 0.21986 -0.02027 0.91847 -0.12233 -0.332031
## SITE 14 -0.101987 -0.28502 0.01314 0.55873 -0.09066 -0.223950
## SITE 15 -0.290401 0.51714 -0.23614 -0.10408 -0.36670 -0.263022
## SITE 16 0.016467 -0.22318 0.14693 -0.09879 -0.21010 0.156923
## SITE 17 -0.053594 -0.78979 0.68552 0.22623 0.55763 0.068555
## SITE 18 0.741297 0.34140 0.34156 -0.78781 -0.33039 0.372025
## SITE 19 2.204147 -0.31903 0.07576 -0.77176 -0.32619 0.237586
## SITE 2 -0.334822 -0.53901 0.20181 0.23760 0.25255 0.460075
## SITE 20 0.132501 1.43824 -0.36307 -0.15683 0.91526 0.652586
## SITE 21 -0.518164 -0.15765 0.51672 0.22690 -0.05180 0.071838
## SITE 22 -0.681351 0.71637 0.44536 0.61813 0.24285 -0.440713
## SITE 23 0.085803 0.07384 -0.18742 -0.58764 -0.50280 0.146049
## SITE 24 -0.506368 1.41199 -0.02580 0.53865 0.25884 0.040947
## SITE 26 0.017028 -0.61108 0.37526 -0.36715 -0.10492 0.425754
## SITE 28 0.121498 -0.47609 0.59944 -0.22080 -0.07107 0.465237
## SITE 29 -0.014961 -0.35365 0.04914 -0.10076 -0.08378 0.641604
## SITE 3 -0.711132 0.09645 0.08469 -0.08718 -0.21517 0.038217
## SITE 30 -0.812113 0.12175 0.55582 -0.16918 -0.25866 0.087617
## SITE 31 0.043616 0.61571 -0.31459 0.47663 -0.16031 -0.651535
## SITE 32 0.562390 -0.35603 -0.38737 0.06837 -0.20621 -0.072343
## SITE 33 -0.372173 -0.03501 0.10319 0.85337 -0.01445 -0.328696
## SITE 34 -0.466651 -0.48378 0.50738 0.02349 -0.08407 0.306511
## SITE 35 0.163917 1.66724 -0.04520 0.22652 0.57157 0.198776
## SITE 36 -0.296043 0.76361 -0.59812 0.40106 -0.04152 -0.249681
## SITE 38 0.302702 -0.34509 -0.16274 -0.49724 -0.25040 -0.005416
## SITE 39 -0.978171 -0.31142 0.36167 0.40699 0.02355 0.020399
## SITE 4 -0.141634 -0.44343 -0.02774 -0.11080 -0.07834 0.180628
## SITE 40 0.496377 0.01681 -0.38350 -0.04028 -0.50240 -0.167352
## SITE 41 1.117637 -0.21808 -0.82799 -0.60061 -0.49878 -0.637014
## SITE 42 0.437517 0.97421 -1.46550 0.08641 1.33505 0.880493
## SITE 5 0.522987 -0.17736 0.27513 0.18757 -0.04206 0.152978
## SITE 6 0.423826 0.07352 -0.91744 -0.10155 -0.42928 -0.789691
## SITE 7 0.013170 -1.17661 0.57227 -1.15454 1.52741 -1.616432
## SITE 9 0.351552 -0.32386 -0.18044 -0.38769 -0.23204 0.160360
##
##
## Site constraints (linear combinations of constraining variables)
##
##          dbRDA1   dbRDA2      MDS1      MDS2      MDS3      MDS4
## SITE 1  -0.079483 -0.44275  0.01302  0.31819 -0.28116 -0.178171
## SITE 11 -0.692558 -0.69501 -0.09719 -0.28198 -0.04679  0.342258
## SITE 12 -0.387516  0.29270  0.31672  0.25334 -0.08234 -0.151368
## SITE 13  0.692033 -0.28074 -0.02027  0.91847 -0.12233 -0.332031
## SITE 14  0.273072 -0.58517  0.01314  0.55873 -0.09066 -0.223950
## SITE 15 -0.503973  0.49304 -0.23614 -0.10408 -0.36670 -0.263022
## SITE 16 -0.041630 -0.31054  0.14693 -0.09879 -0.21010  0.156923
## SITE 17  0.286975 -0.22462  0.68552  0.22623  0.55763  0.068555
## SITE 18  0.355899  0.83587  0.34156 -0.78781 -0.33039  0.372025
## SITE 19  1.702755  0.40556  0.07576 -0.77176 -0.32619  0.237586
## SITE 2  -0.068404 -0.54101  0.20181  0.23760  0.25255  0.460075
## SITE 20  0.005618  0.62143 -0.36307 -0.15683  0.91526  0.652586
## SITE 21 -0.085484  0.08616  0.51672  0.22690 -0.05180  0.071838

```

```

## SITE 22 -0.015359  0.63175  0.44536  0.61813  0.24285 -0.440713
## SITE 23 -0.475351  0.06131 -0.18742 -0.58764 -0.50280  0.146049
## SITE 24 -0.138656  0.63048 -0.02580  0.53865  0.25884  0.040947
## SITE 26 -0.086478 -0.70999  0.37526 -0.36715 -0.10492  0.425754
## SITE 28  0.227529 -0.47771  0.59944 -0.22080 -0.07107  0.465237
## SITE 29 -0.053389 -0.16940  0.04914 -0.10076 -0.08378  0.641604
## SITE 3   -0.805011  0.44279  0.08469 -0.08718 -0.21517  0.038217
## SITE 30 -0.711357  0.97402  0.55582 -0.16918 -0.25866  0.087617
## SITE 31  0.197349  0.41392 -0.31459  0.47663 -0.16031 -0.651535
## SITE 32  0.342870 -0.50733 -0.38737  0.06837 -0.20621 -0.072343
## SITE 33  0.260419 -0.25833  0.10319  0.85337 -0.01445 -0.328696
## SITE 34 -0.213627 -0.34583  0.50738  0.02349 -0.08407  0.306511
## SITE 35  0.299656  0.71657 -0.04520  0.22652  0.57157  0.198776
## SITE 36 -0.265626  0.39128 -0.59812  0.40106 -0.04152 -0.249681
## SITE 38 -0.177490 -0.11612 -0.16274 -0.49724 -0.25040 -0.005416
## SITE 39 -0.502932 -0.21901  0.36167  0.40699  0.02355  0.020399
## SITE 4   -0.213933 -0.31087 -0.02774 -0.11080 -0.07834  0.180628
## SITE 40  0.157625  0.02847 -0.38350 -0.04028 -0.50240 -0.167352
## SITE 41  0.308647 -0.03805 -0.82799 -0.60061 -0.49878 -0.637014
## SITE 42 -0.043511 -0.13560 -1.46550  0.08641  1.33505  0.880493
## SITE 5   0.774214  0.17770  0.27513  0.18757 -0.04206  0.152978
## SITE 6   -0.221478 -0.23059 -0.91744 -0.10155 -0.42928 -0.789691
## SITE 7   -0.080948 -0.35692  0.57227 -1.15454  1.52741 -1.616432
## SITE 9   -0.020466 -0.24745 -0.18044 -0.38769 -0.23204  0.160360
##
##
## Biplot scores for constraining variables
##
##      dbRDA1  dbRDA2 MDS1 MDS2 MDS3 MDS4
## Con_av 0.7628 -0.6467    0    0    0    0
## COD_av 0.4413  0.8974    0    0    0    0

anova(spe.rda)

## Permutation test for dbrda under reduced model
## Permutation: free
## Number of permutations: 999
##
## Model: dbrda(formula = meandist_bray ~ Con_av + COD_av, data = env_select)
##      Df SumOfSqs      F Pr(>F)
## Model     2  0.21484 2.6563  0.001 ***
## Residual 34  1.37498
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

anova(spe.rda, by="term")

## Permutation test for dbrda under reduced model
## Terms added sequentially (first to last)
## Permutation: free
## Number of permutations: 999
##
## Model: dbrda(formula = meandist_bray ~ Con_av + COD_av, data = env_select)

```

```

##          Df SumOfSqs      F Pr(>F)
## Con_av     1  0.12032 2.9752  0.002 **
## COD_av     1  0.09452 2.3373  0.002 **
## Residual  34  1.37498
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

8.2.2 Effect of space on infracommunity structure

```

spe.rda <- dbrda(meandist_bray ~ netcen + updist, data = env_select)
anova(spe.rda)

## Permutation test for dbrda under reduced model
## Permutation: free
## Number of permutations: 999
##
## Model: dbrda(formula = meandist_bray ~ netcen + updist, data = env_select)
##          Df SumOfSqs      F Pr(>F)
## Model      2  0.10742 1.2319  0.138
## Residual  34  1.48240

RsquareAdj(spe.rda)$adj.r.squared

## [1] 0.01271734

anova.cca(spe.rda, step=1000);

## Permutation test for dbrda under reduced model
## Permutation: free
## Number of permutations: 999
##
## Model: dbrda(formula = meandist_bray ~ netcen + updist, data = env_select)
##          Df SumOfSqs      F Pr(>F)
## Model      2  0.10742 1.2319  0.155
## Residual  34  1.48240

anova.cca(spe.rda, step=1000, by="term");

## Permutation test for dbrda under reduced model
## Terms added sequentially (first to last)
## Permutation: free
## Number of permutations: 999
##
## Model: dbrda(formula = meandist_bray ~ netcen + updist, data = env_select)
##          Df SumOfSqs      F Pr(>F)
## netcen     1  0.04949 1.1352  0.236
## updist     1  0.05792 1.3285  0.137
## Residual  34  1.48240

```

```
RsquareAdj(spe.rda)$adj.r.squared;
```

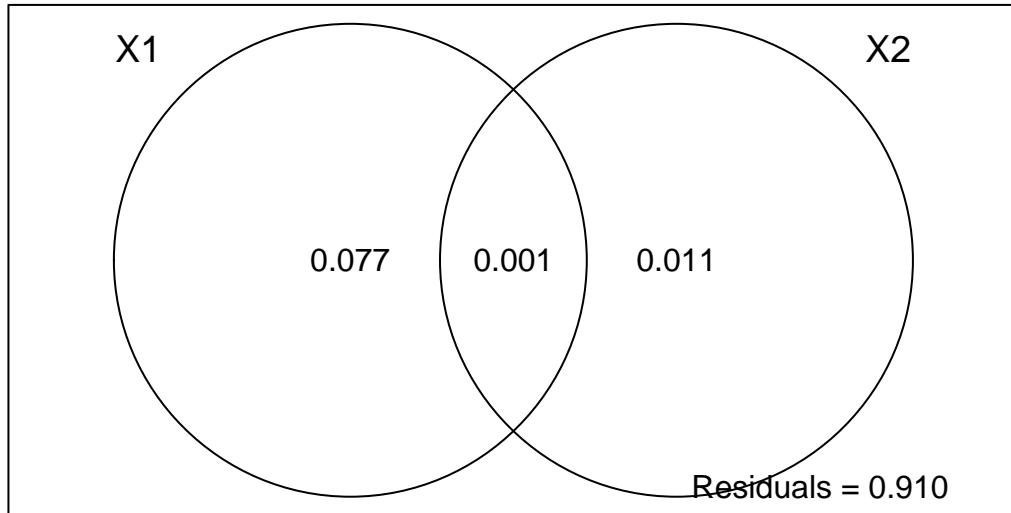
```
## [1] 0.01271734
```

```
RsquareAdj(spe.rda)$r.squared
```

```
## [1] 0.06756637
```

8.2.3 Variation partitioning

```
#Variation partitioning  
spe.varpart1 <- varpart(meandist_bray, env_select[,1:8], env_select[,9:10])  
plot(spe.varpart1,digits=2)
```



```
spe.varpart1
```

```
##  
## Partition of squared Unknown user-supplied distance in dbRDA  
##  
## Call: varpart(Y = meandist_bray, X = env_select[, 1:8], env_select[,  
## 9:10])
```

```

## 
## Explanatory tables:
## X1: env_select[, 1:8]
## X2: env_select[, 9:10]
##
## No. of explanatory tables: 2
## Total variation (SS): 1.5898
## No. of observations: 37
##
## Partition table:
##                               Df R.squared Adj.R.squared Testable
## [a+c] = X1                 8   0.28328     0.07850      TRUE
## [b+c] = X2                 2   0.06757     0.01272      TRUE
## [a+b+c] = X1+X2            10  0.34269     0.08988      TRUE
## Individual fractions
## [a] = X1|X2                8           0.07716      TRUE
## [b] = X2|X1                2           0.01138      TRUE
## [c]                         0           0.00134     FALSE
## [d] = Residuals             0           0.91012     FALSE
## ---
## Use function 'dbrda' to test significance of fractions of interest

anova.cca(dbRDA(meandist_bray ~ T_av + O2_sat_av + Con_av + COD_av
                  + NH4_av + Nt_av + pool_riffle + meander + Condition(netcen + updist),
                  data=env_select), step=1000)

## Permutation test for dbRDA under reduced model
## Permutation: free
## Number of permutations: 999
##
## Model: dbRDA(formula = meandist_bray ~ T_av + O2_sat_av + Con_av + COD_av + NH4_av + Nt_av + pool_riffle + meander + Condition(T_av + O2_sat_av + Con_av + COD_av + NH4_av + Nt_av + pool_riffle + meander), data=env_select)
## Df SumOfSqs      F Pr(>F)
## Model      8   0.4374 1.3603  0.011 *
## Residual  26   1.0450
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

anova.cca(dbRDA(meandist_bray ~ netcen + updist +
                  Condition(T_av + O2_sat_av + Con_av + COD_av
                  + NH4_av + Nt_av + pool_riffle + meander), data=env_select), step=1000)

## Permutation test for dbRDA under reduced model
## Permutation: free
## Number of permutations: 999
##
## Model: dbRDA(formula = meandist_bray ~ netcen + updist + Condition(T_av + O2_sat_av + Con_av + COD_av + NH4_av + Nt_av + pool_riffle + meander), data=env_select)
## Df SumOfSqs      F Pr(>F)
## Model      2   0.09446 1.1751  0.174
## Residual  26   1.04500

```