Multinomial Regression

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I would like to study the factors that possibly are associated with party designations of voters.

Explore

```
d <- read_csv("nes96.csv") %>% select(-vote,-contains("LR")) %>% #reduce the data
  select(PID,everything())
```

```
## Parsed with column specification:
## cols(
##   popul = col_double(),
##   TVnews = col_double(),
##   selfLR = col_character(),
##   ClinLR = col_character(),
##   DoleLR = col_character(),
##   PID = col_character(),
##   age = col_double(),
##   educ = col_character(),
##   income = col_double(),
##   vote = col_character()
## )
```

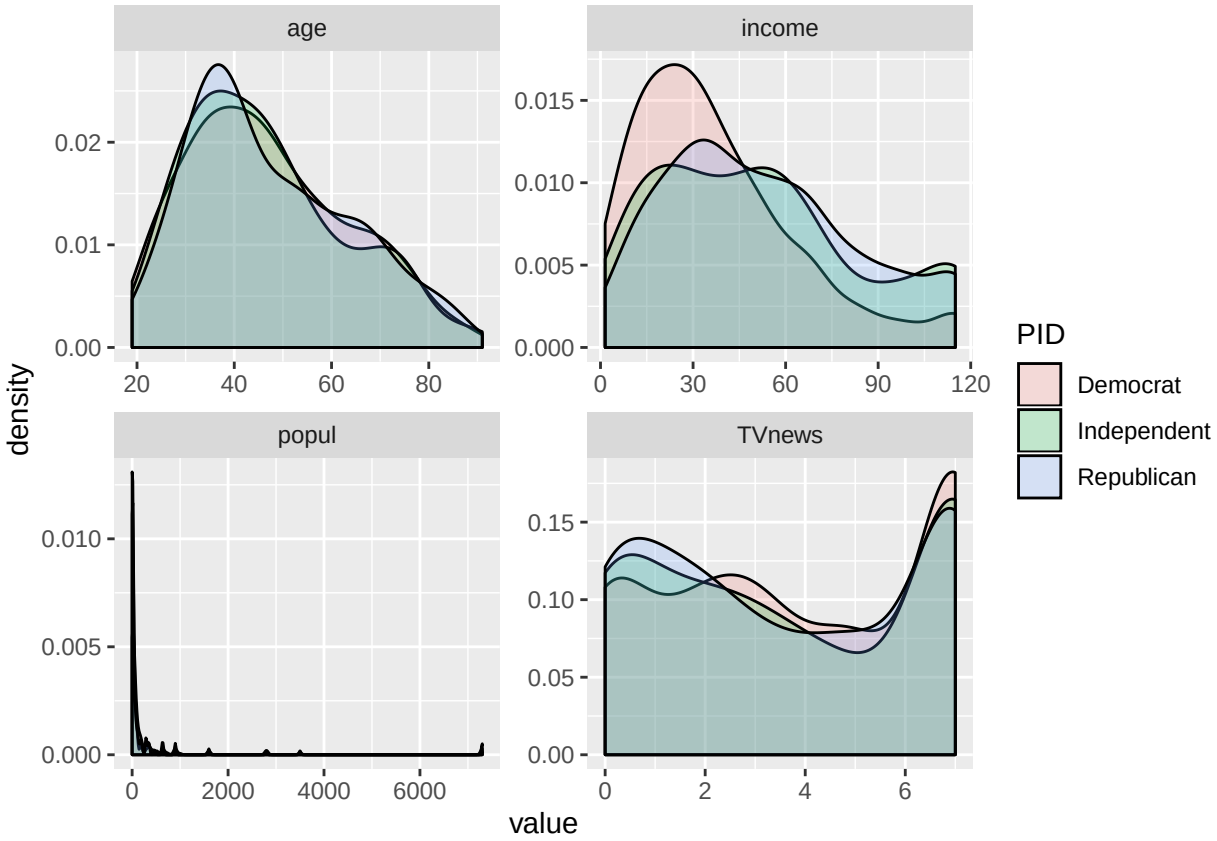
```
d <- d %>% mutate(PID=factor(PID))

dim(d)
```

```
## [1] 944   6
```

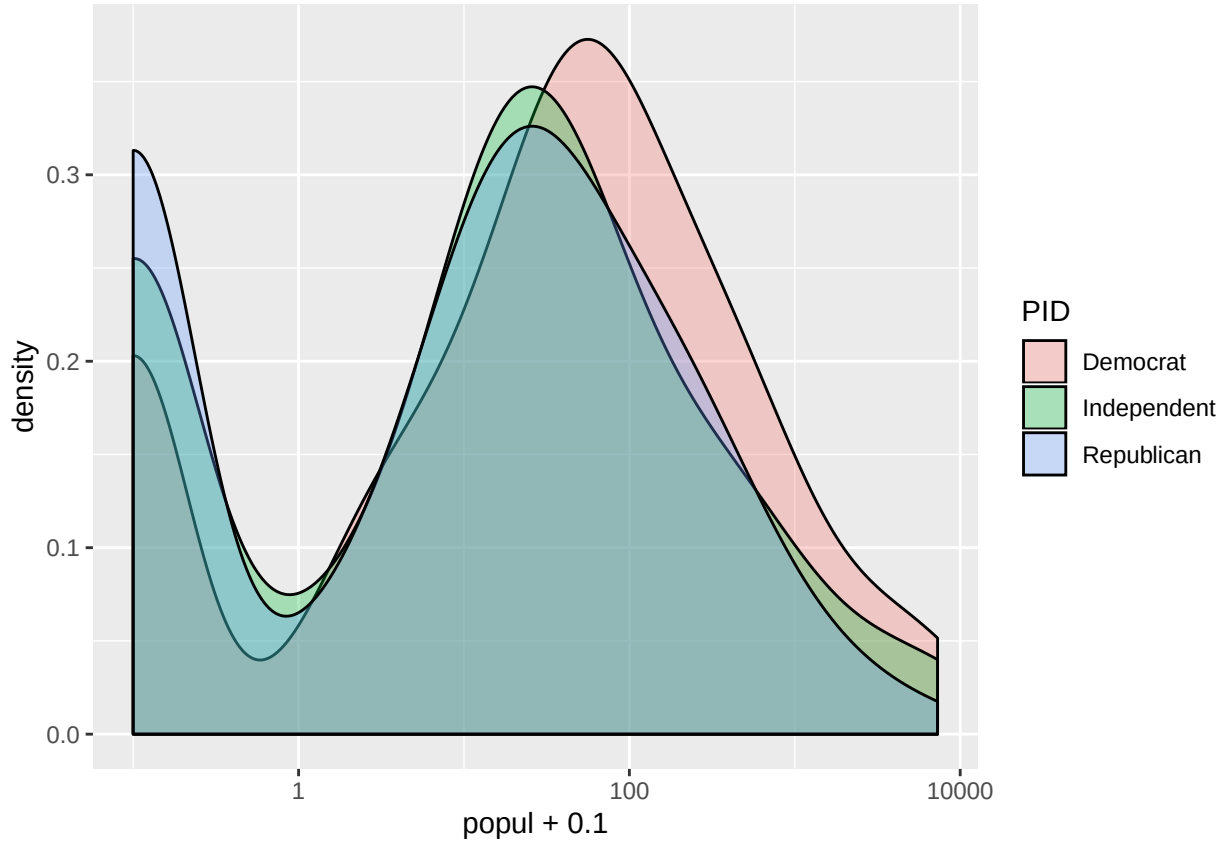
```
head(d) #Predict which party a person votes for
```

```
## # A tibble: 6 x 6
##   PID        popul TVnews   age educ  income
##   <fct>      <dbl>  <dbl> <dbl> <chr>  <dbl>
## 1 Republican     0      7    36 HS       1.5
## 2 Democrat     190      1    20 Coll     1.5
## 3 Democrat      31      7    24 BAdeg    1.5
## 4 Democrat      83      4    28 BAdeg    1.5
## 5 Democrat     640      7    68 BAdeg    1.5
## 6 Democrat     110      3    21 Coll     1.5
```

```
d %>% select_if(is.numeric) %>%
  bind_cols(select(d,PID)) %>%
  gather(key=varname,val=value,-PID) %>%
  ggplot(aes(value))+
  geom_density(aes(fill=PID),alpha=0.2)+
  facet_wrap(~varname,scales="free")
```

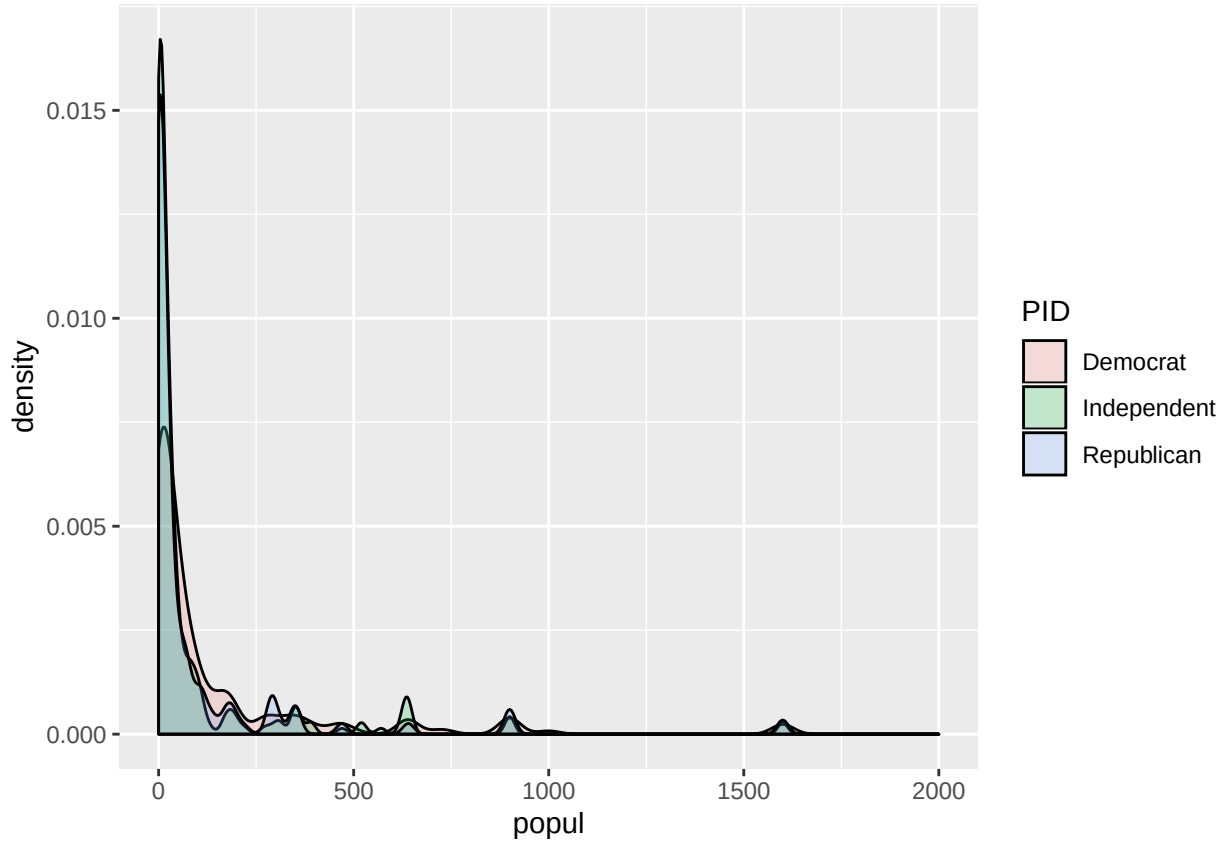



```
d %>%
  ggplot(aes(popul+0.1))+
  geom_density(aes(fill=PID),alpha=0.3)+
  scale_x_log10() #log transformation
```

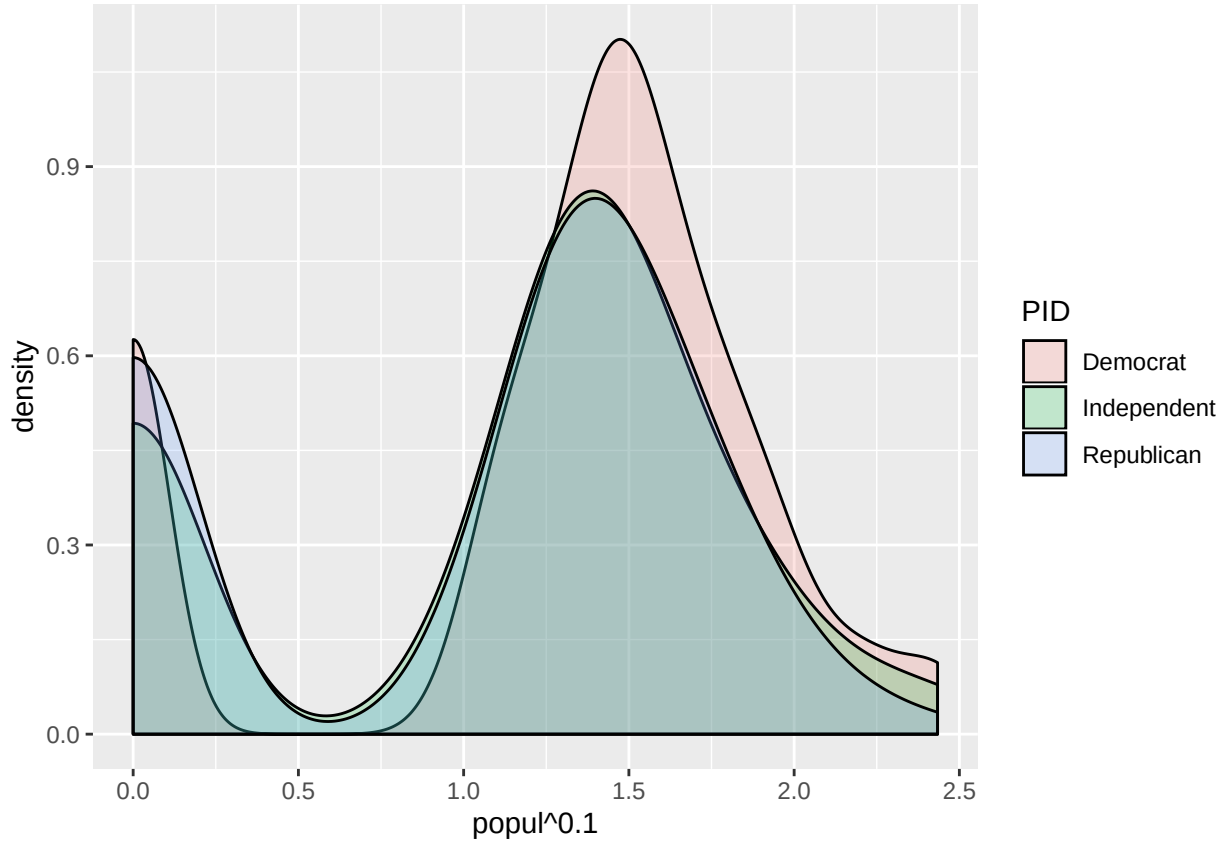



```
#People who favor democrat party tend to live in more crowded places

d %>%
  ggplot(aes(popul))+
  geom_density(aes(fill=PID),alpha=0.2)+
  lims(x=c(0,2000))  #not clear, try boxplot
```

```
## Warning: Removed 35 rows containing non-finite values (stat_density).
```




```
d %>%
  ggplot(aes(popul^0.1))+
  geom_density(aes(fill=PID),alpha=0.2)
```




```
#More or less the same pic we get by log transformation. Independent and republican are close to each o

#res <- MASS::boxcox(I(d$popul+.01)~1,plotit=FALSE)
#res


#Income ve population seems significant
```

```
#d2 <- d  %>% mutate(educ=factor(educ,labels=c("HSdrop","HS","CCdeg","Coll","BAdeg","MAdeg","MS"),order


  d %>%  count(educ)  #check education
```

```
## # A tibble: 7 x 2
##   educ       n
##   <chr>  <int>
## 1 BAdeg    227
## 2 CCdeg     90
## 3 Coll     187
## 4 HS       248
## 5 HSdrop    52
## 6 MAdeg    127
## 7 MS        13
```

```
  d <- d %>% mutate(educ=
                forcats::fct_collapse(educ, MS=c("MAdeg","MS")))
```

```r
d %>% count(PID,educ) %>%
   group_by(educ,PID) %>%  #Conditional probability
   summarize(n=mean(n))
```

```
## # A tibble: 18 x 3
## # Groups:   educ [6]
##    educ   PID             n
##    <fct>  <fct>       <dbl>
##  1 BAdeg  Democrat       81
##  2 BAdeg  Independent    55
##  3 BAdeg  Republican     91
##  4 CCdeg  Democrat       34
##  5 CCdeg  Independent    24
##  6 CCdeg  Republican     32
##  7 Coll   Democrat       74
##  8 Coll   Independent    40
##  9 Coll   Republican     73
## 10 HS     Democrat      108
## 11 HS     Independent    63
## 12 HS     Republican     77
## 13 HSdrop Democrat       29
## 14 HSdrop Independent    14
## 15 HSdrop Republican      9
## 16 MS     Democrat       54
## 17 MS     Independent    43
## 18 MS     Republican     43
```

```r
d %>% select(PID,educ) %>% table() %>% prop.table(1) %>% round(2) #in proportions
```

```
##              educ
## PID           BAdeg CCdeg Coll   HS HSdrop   MS
##   Democrat     0.21  0.09 0.19 0.28   0.08 0.14
##   Independent  0.23  0.10 0.17 0.26   0.06 0.18
##   Republican   0.28  0.10 0.22 0.24   0.03 0.13
```

```r
d %>% select(educ,PID) %>% table()
```

```
##         PID
## educ     Democrat Independent Republican
##   BAdeg        81          55         91
##   CCdeg        34          24         32
##   Coll         74          40         73
##   HS          108          63         77
##   HSdrop       29          14          9
##   MS           54          43         43
```

```r
d %>% select(educ,PID) %>% table() %>% prop.table(1) %>% round(2) #in proportions
```

```
##         PID
## educ     Democrat Independent Republican
##   BAdeg      0.36        0.24       0.40
##   CCdeg      0.38        0.27       0.36
##   Coll       0.40        0.21       0.39
##   HS         0.44        0.25       0.31
##   HSdrop     0.56        0.27       0.17
##   MS         0.39        0.31       0.31
```

Model

```
#Democrat is the first category, zero by default. Everything is relative to democrat.

#contrasts(d$PID)
#levels(d$PID)

mmod <- nnet::multinom(PID ~., d,maxit=200)
```

```
## # weights:  33 (20 variable)
## initial  value 1037.090001
## iter  10 value 996.915691
## iter  20 value 979.849738
## final  value 979.650978
## converged
```

```
summary(mmod)
```

```
## Call:
## nnet::multinom(formula = PID ~ ., data = d, maxit = 200)
##
## Coefficients:
##             (Intercept)         popul      TVnews          age  educCCdeg
## Independent   -1.221106 -5.179798e-05 -0.02036463 0.0009988248 0.21958836
## Republican    -1.061830 -2.591444e-04 -0.04424802 0.0099137574 0.01064922
##                  educColl     educHS educHSdrop      educMS     income
## Independent -0.0002392317  0.1375205  0.1768412  0.04258506 0.01648970
## Republican   0.1216682012 -0.1778995 -0.8462687 -0.51208756 0.01782431
##
## Std. Errors:
##             (Intercept)        popul     TVnews         age educCCdeg
## Independent   0.2882392 7.129916e-05 0.03440613 0.005780792 0.2637033
## Republican    0.2805644 9.854945e-05 0.03233816 0.005370267 0.2554582
##              educColl    educHS educHSdrop    educMS      income
## Independent 0.2154492 0.1894819  0.3039836 0.2355921 0.002937789
## Republican  0.1965322 0.1859990  0.3543111 0.2365964 0.002774103
##
## Residual Deviance: 1959.302
## AIC: 1999.302
```

```
anova(update(mmod,.~.-TVnews),mmod) #Test ho that this is zero
```

```
## # weights:  30 (18 variable)
## initial  value 1037.090001
## iter  10 value 988.758048
## iter  20 value 980.612711
## final  value 980.589239
## converged
```

```
##                                 Model Resid. df Resid. Dev   Test    Df
## 1          popul + age + educ + income      1870   1961.178           NA
## 2 popul + TVnews + age + educ + income      1868   1959.302 1 vs 2     2
##   LR stat.   Pr(Chi)
## 1       NA        NA
## 2 1.876522 0.3913078
```

```
#We are unable to reject because of P value of 0.39

anova(update(mmod,.~.-income),mmod) #Test ho that this is zero
```

```
## # weights:  30 (18 variable)
## initial  value 1037.090001
## iter  10 value 1010.038594
## iter  20 value 1004.509870
## final  value 1004.399333
## converged
```

```
##                                 Model Resid. df Resid. Dev   Test    Df
## 1          popul + TVnews + age + educ      1870   2008.799           NA
## 2 popul + TVnews + age + educ + income      1868   1959.302 1 vs 2     2
##   LR stat.      Pr(Chi)
## 1       NA           NA
## 2 49.49671 1.786182e-11
```

```
#p value is almost zero, so reject.

anova(update(mmod,.~.-educ),mmod) #Test ho that this is zero
```

```
## # weights:  18 (10 variable)
## initial  value 1037.090001
## iter  10 value 996.160773
## final  value 986.674103
## converged
```

```
##                                 Model Resid. df Resid. Dev   Test    Df
## 1        popul + TVnews + age + income      1878   1973.348           NA
## 2 popul + TVnews + age + educ + income      1868   1959.302 1 vs 2    10
##   LR stat.   Pr(Chi)
## 1       NA        NA
## 2 14.04625 0.1708925
```

```
#pvalue:0.17
#H0: B2Educ=B3Educ=0
#At 5% we are unable to reject. Education doesn't seem like an important feature while TVnews still in

anova(update(mmod,.~.-educ-TVnews),mmod) #Test ho that this is zero
```

```
## # weights:  15 (8 variable)
## initial  value 1037.090001
## iter  10 value 997.236745
## final  value 987.563863
## converged
```

```
##                                 Model Resid. df Resid. Dev   Test    Df
## 1                popul + age + income      1880   1975.128           NA
## 2 popul + TVnews + age + educ + income      1868   1959.302 1 vs 2    12
##   LR stat.   Pr(Chi)
## 1       NA        NA
## 2 15.82577 0.1993471
```

```
##At 5% we are unable to reject.

anova(update(mmod,.~.-educ-TVnews-age-popul),mmod)
```

```
## # weights:  9 (4 variable)
## initial  value 1037.090001
## final  value 992.712152
## converged
```

```
##                                 Model Resid. df Resid. Dev   Test    Df
## 1                              income      1884   1985.424           NA
## 2 popul + TVnews + age + educ + income      1868   1959.302 1 vs 2    16
##   LR stat.    Pr(Chi)
## 1       NA         NA
## 2 26.12235 0.05233086
```

```
mmod1 <- step(mmod,trace=FALSE)
```

```
## trying - popul
## trying - TVnews
## trying - age
## trying - educ
## trying - income
## # weights:  18 (10 variable)
## initial  value 1037.090001
## iter  10 value 996.160773
## final  value 986.674103
## converged
## trying - popul
## trying - TVnews
## trying - age
## trying - income
## # weights:  15 (8 variable)
## initial  value 1037.090001
## iter  10 value 987.824810
## final  value 987.493416
## converged
## trying - popul
## trying - TVnews
## trying - income
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.904029
## final  value 987.903457
## converged
## trying - popul
## trying - income
```

```
#step(mmod)
#Population and income seems significant, continue with them



#Evaluate the model: Grouped data~Chi square
```

TVnews seem unimportant, while income looks very significant.

```
preds <- predict(mmod1,type="probs")

p <- preds[1,]
```

```r
simul <- function(u,p){
  findInterval(u,cumsum(p))+1}


set.seed(451)
st <- invisible(system.time({nboot <- 1000
deviance.list <- rep(NA,nboot)

for(i in seq(nboot)){

  PID.boot <- preds %>%
  as_tibble %>%
  mutate(u=runif(n()),
         p=pmap(list(Democrat,Independent,Republican),
                ~c(..1,..2,..3)),
                pidid=map2_dbl(u,p,simul),
                PID=c("Democrat","Independent","Republican")[pidid]) %>%
                extract2("PID")

  deviance.list[i] <- deviance(update(mmod1,data=mutate(d,PID=PID.boot),maxit=500))
         }
}))
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.094789
## final  value 986.094623
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1000.565557
## iter  10 value 1000.565553
## iter  10 value 1000.565553
## final  value 1000.565553
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.274699
## final  value 991.274383
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.502414
## final  value 987.501465
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.296688
## final  value 984.296672
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.234322
```

```
## final  value 990.233679
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.380533
## final  value 979.376632
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.278564
## final  value 998.277255
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.777124
## final  value 975.776588
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.477629
## final  value 978.476901
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.442777
## final  value 978.442637
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.685546
## final  value 979.681780
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.224896
## final  value 992.033230
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.852267
## final  value 994.850681
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.863087
## final  value 985.836213
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.196881
## final  value 990.196864
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 979.011499
## final  value 979.011343
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.614532
## final  value 991.614518
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.920158
## final  value 984.915625
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.083388
## final  value 973.733723
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.152612
## final  value 988.103652
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.346638
## final  value 989.966936
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.746102
## final  value 999.745735
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.944168
## final  value 984.943060
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.982039
## final  value 973.801613
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.825894
## final  value 986.824850
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.081380
## final  value 982.080896
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 996.550163
## final  value 996.549130
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.337335
## final  value 973.337178
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 972.905745
## final  value 972.898310
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.319028
## final  value 976.004036
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.156653
## final  value 973.500357
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.566109
## final  value 981.566062
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.616678
## final  value 978.600165
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.961916
## final  value 990.960496
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.301501
## final  value 985.293454
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.919986
## final  value 983.913328
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.372324
## final  value 986.368472
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.935930
## final  value 994.935643
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.316922
## final  value 982.316575
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.668176
## final  value 979.667828
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 953.629896
## final  value 953.629537
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.914377
## iter  10 value 998.914374
## iter  10 value 998.914374
## final  value 998.914374
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.771965
## final  value 984.755430
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.275018
## final  value 987.273379
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1011.136163
## final  value 1011.136145
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.334673
## final  value 978.333002
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 971.826729
## final  value 971.747714
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 992.559233
## final  value 992.559208
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 972.440348
## final  value 972.439515
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.831570
## final  value 979.831529
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 959.073794
## final  value 959.065810
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.820405
## final  value 985.820354
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.444060
## final  value 989.444014
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.806150
## final  value 988.779021
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.959235
## final  value 976.948229
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.243199
## final  value 980.224049
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.813096
## final  value 981.687693
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.348833
## final  value 986.337498
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 977.263637
## final  value 977.263541
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.892601
## final  value 975.892443
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.495587
## final  value 976.843745
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1005.562760
## final  value 1005.562747
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.737970
## final  value 995.737730
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.728738
## final  value 998.727167
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.074715
## final  value 979.074619
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 961.375541
## final  value 961.372567
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.553977
## final  value 978.362936
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.217979
## final  value 992.355795
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.506764
## final  value 987.506240
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.266583
## final  value 978.085182
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.861596
## final  value 991.861565
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.406249
## final  value 989.406108
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.051282
## final  value 984.051197
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.335478
## final  value 992.335448
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1008.541707
## iter  10 value 1008.541698
## iter  10 value 1008.541698
## final  value 1008.541698
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.682884
## final  value 977.501839
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.325633
## final  value 994.317498
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.205549
## final  value 988.205536
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.683341
## final  value 980.682685
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 985.878160
## final  value 985.874573
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.983489
## final  value 998.979114
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.452951
## final  value 975.452708
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 968.533733
## final  value 968.512275
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.104035
## iter  10 value 987.104028
## iter  10 value 987.104028
## final  value 987.104028
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1008.421324
## final  value 1008.419496
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.794614
## final  value 979.793465
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 972.035123
## final  value 972.031896
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.334932
## final  value 973.330247
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.472679
## final  value 986.472566
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.957573
## final  value 988.955184
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.810419
## final  value 984.810375
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.263933
## final  value 977.263833
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 970.395102
## final  value 970.395085
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.771339
## final  value 985.770992
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.924293
## final  value 983.414804
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.453837
## final  value 980.453030
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.713332
## final  value 987.708004
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.825566
## final  value 984.825513
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 964.543865
## final  value 964.543794
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.512115
## final  value 981.209757
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 969.780438
```

```
## final  value 969.777541
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.809375
## final  value 982.680591
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.852405
## final  value 976.481978
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.633042
## final  value 993.244670
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.523552
## final  value 985.523252
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.931939
## final  value 992.931194
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.306603
## final  value 997.304437
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.225314
## final  value 991.225073
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.612505
## iter  10 value 990.612501
## iter  10 value 990.612501
## final  value 990.612501
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.206144
## final  value 986.206114
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.875002
## final  value 999.874972
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.459829
## final  value 973.459795
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.181117
## final  value 978.180962
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.851580
## final  value 977.627703
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.688211
## final  value 992.688188
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.067102
## final  value 989.066451
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.240877
## final  value 985.227212
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.413353
## final  value 997.413300
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.714697
## final  value 976.713864
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1004.364862
## final  value 1004.364837
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 969.916105
## final  value 969.525728
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.419392
## final  value 977.419100
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.518302
## final  value 997.518035
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 972.603239
## final  value 972.603177
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.639665
## final  value 976.130602
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 996.764795
## final  value 996.764754
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.492086
## final  value 982.457037
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.386977
## final  value 999.386869
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.015848
## final  value 974.014204
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.530201
## final  value 983.529933
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.758057
## final  value 978.757948
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.899198
## final  value 998.896740
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 972.845271
```

```
## final  value 972.842403
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.438411
## final  value 984.437773
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.136031
## final  value 978.135733
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.655820
## final  value 993.652388
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.011721
## final  value 973.009331
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.111732
## final  value 987.111635
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.844060
## final  value 989.843895
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.448837
## final  value 995.448189
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.077027
## final  value 985.077007
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.919040
## final  value 982.916318
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.873700
## final  value 975.873637
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 978.961517
## final  value 978.960605
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.954033
## final  value 991.953158
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.558575
## final  value 993.558460
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.964561
## final  value 991.964550
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.385323
## final  value 983.374703
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1004.647598
## final  value 1004.647295
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.676004
## final  value 976.674269
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.778443
## final  value 987.776464
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.090253
## final  value 976.087379
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 969.137080
## final  value 969.136438
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.537083
## final  value 983.536738
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 987.790892
## final  value 987.790593
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 968.541853
## final  value 968.534670
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.750822
## final  value 989.750702
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.253237
## final  value 989.252349
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.691956
## final  value 979.691938
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.341410
## iter  10 value 988.341402
## iter  10 value 988.341402
## final  value 988.341402
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.721792
## iter  10 value 989.721783
## iter  10 value 989.721782
## final  value 989.721782
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.680513
## final  value 994.680230
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.330238
## final  value 977.716777
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 996.646471
## final  value 996.646455
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 990.347306
## final  value 990.347181
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.843481
## final  value 993.843400
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.950014
## iter  10 value 997.950012
## iter  10 value 997.950012
## final  value 997.950012
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.560762
## final  value 995.560710
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.516108
## iter  10 value 981.516103
## iter  10 value 981.516103
## final  value 981.516103
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.304996
## final  value 995.194141
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 967.406002
## final  value 967.246537
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.244236
## final  value 976.712270
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.675478
## final  value 987.674528
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.157023
## final  value 986.153461
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 993.838362
## final  value 993.837597
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.768581
## final  value 975.766932
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.916834
## final  value 986.913184
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.162157
## iter  10 value 986.162153
## iter  10 value 986.162153
## final  value 986.162153
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.542567
## final  value 988.537167
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1001.360281
## final  value 1001.358006
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.225098
## final  value 977.355515
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.237959
## final  value 978.232851
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.687368
## final  value 980.686540
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.644296
## final  value 988.644190
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.876034
```

```
## final  value 990.875862
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.278731
## final  value 986.278607
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.540909
## final  value 993.537924
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.400055
## final  value 992.385535
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.038589
## final  value 985.038571
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.825953
## final  value 988.825916
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.229975
## final  value 982.229816
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.232222
## final  value 991.230343
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1006.031874
## iter  10 value 1006.031868
## iter  10 value 1006.031868
## final  value 1006.031868
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.792186
## final  value 984.791771
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.035976
## final  value 981.033132
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.390089
## final  value 999.389774
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.363998
## final  value 990.363963
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.948313
## final  value 978.942726
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.949500
## final  value 978.947383
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 996.175113
## final  value 996.165562
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.526132
## final  value 985.522835
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.147164
## final  value 990.146954
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.839548
## final  value 974.780563
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.874760
## final  value 985.873504
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.537713
## final  value 978.537664
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.584286
## final  value 995.584261
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.359694
## final  value 980.359638
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.519239
## final  value 980.519146
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.169545
## final  value 990.166510
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1017.167602
## iter  10 value 1017.167602
## iter  10 value 1017.167602
## final  value 1017.167602
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.290573
## final  value 986.290540
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.464771
## final  value 992.453780
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.426596
## final  value 984.421336
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.582950
## final  value 977.562728
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.578254
## final  value 990.577003
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.702658
## final  value 976.701451
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 989.805887
## final  value 989.804407
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.831626
## final  value 984.831416
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.962595
## final  value 994.961892
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.991224
## final  value 991.991071
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 967.808771
## final  value 967.807820
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.042584
## final  value 973.042420
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.868368
## final  value 979.384473
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 970.114140
## final  value 970.109540
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.889736
## final  value 979.888784
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.082828
## final  value 981.080945
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.797269
## final  value 991.797159
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 962.791008
## final  value 962.787902
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.718433
## final  value 987.714421
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.758771
## iter  10 value 999.758764
## iter  10 value 999.758764
## final  value 999.758764
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.923652
## final  value 989.910228
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.995820
## final  value 986.994277
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 969.871511
## final  value 969.594484
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.757079
## final  value 982.753825
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.925798
## final  value 973.924194
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.147906
## final  value 984.749212
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.755012
## final  value 986.754932
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 996.318232
## final  value 996.309983
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.392616
## final  value 986.392328
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.285382
## final  value 978.939724
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 971.231455
## final  value 971.230913
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 971.120478
## final  value 971.117106
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.822645
## final  value 989.822596
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.574939
## final  value 982.573901
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1008.394021
## final  value 1008.393980
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.686206
## final  value 978.685583
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.919803
## final  value 988.919734
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.649374
## final  value 980.648992
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 996.842309
## final  value 996.841096
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.616463
## final  value 983.616202
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.529193
## final  value 983.528542
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 963.964623
## final  value 963.962420
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 996.833686
## iter  10 value 996.833683
## iter  10 value 996.833682
## final  value 996.833682
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.978594
## final  value 991.978058
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.253200
## final  value 975.253172
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 971.580902
## final  value 971.503040
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.929176
## final  value 978.064718
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.290890
## final  value 982.290800
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.073760
```

```
## final  value 990.073632
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.336136
## final  value 991.335938
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.275206
## final  value 976.275009
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.847014
## final  value 989.844820
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.770866
## final  value 994.738486
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.048132
## final  value 988.047370
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.694847
## final  value 988.690454
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1002.325981
## final  value 1002.324544
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.252327
## final  value 986.251893
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.143919
## final  value 973.141995
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.293117
## final  value 988.293038
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 982.722554
## iter  10 value 982.722545
## iter  10 value 982.722545
## final  value 982.722545
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1002.111357
## final  value 1002.109754
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.320771
## final  value 981.319722
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.562455
## final  value 976.820447
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.193867
## final  value 987.191178
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 972.287517
## final  value 972.285595
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.534967
## final  value 993.534819
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 972.367299
## final  value 972.355069
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.323807
## final  value 988.589411
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.854245
## final  value 976.846332
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.264002
## final  value 978.262387
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.979442
## final  value 994.537963
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.931427
## final  value 977.931401
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 972.602902
## final  value 972.602561
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.435365
## final  value 991.434702
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.216929
## final  value 998.216858
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.143483
## final  value 991.143375
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.779393
## final  value 976.619115
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.956416
## final  value 990.952284
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.091097
## final  value 993.090423
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 971.988652
## final  value 971.980163
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.543790
```

```
## final  value 981.463002
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.078877
## final  value 982.077162
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.587370
## final  value 983.583931
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.146123
## final  value 994.024472
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.710445
## final  value 994.709568
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.779275
## final  value 985.090678
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.080352
## iter  10 value 992.080351
## iter  10 value 992.080351
## final  value 992.080351
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1000.049741
## final  value 1000.049585
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.003511
## final  value 983.003034
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.911332
## final  value 975.902981
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.278372
## final  value 990.278261
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.350305
## final  value 981.348170
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.362024
## final  value 985.340990
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.720257
## final  value 979.720230
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.825647
## final  value 973.500434
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.355700
## final  value 998.355001
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.294919
## final  value 993.293135
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1002.143599
## final  value 1002.142463
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.377995
## final  value 986.377867
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1002.201433
## iter  10 value 1002.201433
## iter  10 value 1002.201433
## final  value 1002.201433
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.081468
## final  value 998.752649
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 987.403045
## final  value 987.400970
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.870539
## final  value 973.733313
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1003.076920
## final  value 1003.076508
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 965.161347
## final  value 965.120894
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 972.806678
## final  value 972.688107
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.698372
## final  value 991.688606
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.177776
## final  value 979.154017
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.785502
## final  value 992.775993
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1002.186302
## final  value 1002.186215
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.823378
## final  value 985.823360
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.657951
## final  value 995.657926
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 1005.901181
## iter  10 value 1005.901180
## iter  10 value 1005.901180
## final  value 1005.901180
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.169600
## final  value 978.169361
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.336184
## final  value 993.326966
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.485791
## final  value 983.359467
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.661804
## final  value 981.661197
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.939515
## final  value 973.881946
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.854011
## final  value 979.853354
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.283668
## final  value 998.283595
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.961923
## final  value 993.956188
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.899671
## iter  10 value 992.899670
## iter  10 value 992.899670
## final  value 992.899670
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 992.913692
## final  value 992.913632
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.507770
## final  value 983.977171
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 971.880797
## final  value 971.880191
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.238147
## final  value 979.067863
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.068855
## final  value 982.068661
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 970.653926
## final  value 970.653461
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.936055
## final  value 975.934993
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.352369
## final  value 998.352356
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.815430
## final  value 975.813300
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.843053
## final  value 983.842754
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.017785
## final  value 982.017564
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.379715
## final  value 985.378860
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.101072
## final  value 990.098624
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.317375
## final  value 984.317291
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.987776
## final  value 997.987626
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.738657
## final  value 993.738357
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 960.736578
## final  value 960.719750
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1001.415347
## iter  10 value 1001.415341
## iter  10 value 1001.415341
## final  value 1001.415341
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.486100
## final  value 983.485855
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1004.662204
## final  value 1004.662186
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 972.735172
## final  value 972.735006
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 991.997582
## final  value 991.994191
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.215068
## iter  20 value 974.167529
## final  value 974.166903
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.136854
## final  value 981.126813
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.912139
## final  value 978.910295
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.758542
## final  value 990.756713
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.914264
## final  value 983.913928
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.705075
## final  value 991.704619
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.873545
## final  value 988.862201
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.243206
## final  value 999.243182
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.157635
## final  value 976.157432
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.528905
## final  value 975.528813
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.446985
## final  value 986.434040
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.913693
## final  value 993.309662
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.150287
## final  value 988.150135
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.668171
## final  value 987.668145
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.208764
## final  value 976.347328
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.711335
## final  value 983.710793
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.635892
## final  value 974.627794
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.587797
## final  value 988.587764
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.206706
## final  value 976.203988
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.214421
## final  value 985.166634
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.140897
## final  value 978.135467
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.872324
## final  value 984.872232
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1005.469502
## final  value 1005.468113
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.272643
## final  value 989.272144
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.591670
## final  value 997.591614
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.197066
## final  value 987.120506
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.102250
## final  value 999.101767
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.324367
## final  value 986.322909
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.034642
## final  value 981.032516
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 971.891479
## final  value 971.198287
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.795248
## final  value 979.794099
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.892549
```

```
## final  value 984.778831
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.774390
## final  value 986.773155
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.762191
## final  value 991.759588
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 965.449161
## final  value 965.448896
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.394998
## final  value 976.389539
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.534415
## final  value 987.534356
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.514368
## final  value 974.512758
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.369801
## final  value 980.050272
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.611512
## final  value 978.611454
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.113534
## final  value 991.110481
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 963.417861
## final  value 963.407400
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 987.414461
## final  value 987.410731
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.973763
## final  value 991.931580
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.405376
## final  value 989.405020
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.013712
## final  value 979.013521
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.456284
## final  value 981.372318
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.775921
## final  value 979.775696
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.831484
## final  value 992.815450
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.082140
## final  value 979.081166
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.232964
## final  value 994.232947
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.415542
## iter  10 value 981.415538
## iter  10 value 981.415538
## final  value 981.415538
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.459638
## final  value 978.459627
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.910845
## final  value 997.910539
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 965.261830
## final  value 965.086800
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.177337
## final  value 993.176095
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.355289
## final  value 984.355117
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.911508
## final  value 974.896738
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.330727
## final  value 998.330664
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.145490
## final  value 991.145349
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.300366
## final  value 981.300335
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.923019
## final  value 986.921725
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.043290
## final  value 991.042395
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.356176
```

```
## final  value 993.356028
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.165604
## final  value 981.165525
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.288635
## final  value 995.287652
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.682643
## final  value 980.682612
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.369704
## final  value 976.228971
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.640467
## final  value 993.640432
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.187402
## final  value 978.181961
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.935789
## final  value 982.935777
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.339247
## final  value 990.329549
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.929005
## final  value 987.927304
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.884487
## final  value 998.883604
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 991.600788
## final  value 991.600677
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.396861
## final  value 979.388931
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.306840
## final  value 984.299211
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.565540
## final  value 994.565511
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.730382
## final  value 980.729244
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 972.999394
## final  value 972.999116
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.660132
## final  value 973.357066
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.049121
## final  value 982.963559
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.102008
## final  value 986.101750
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 969.198289
## final  value 969.170335
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.633168
## final  value 984.631892
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 983.685238
## final  value 983.685055
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.604041
## final  value 983.603938
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.043453
## final  value 986.042492
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.885691
## final  value 985.881481
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.112209
## final  value 991.111907
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.485017
## final  value 990.484934
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.748172
## final  value 986.744282
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.406786
## final  value 997.039337
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 965.751203
## final  value 965.745185
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.224614
## final  value 987.210433
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.566990
## final  value 997.565802
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.933558
## final  value 981.843122
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 967.950702
## final  value 967.950530
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.876601
## final  value 985.873316
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.746766
## final  value 982.206787
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.544045
## final  value 978.543904
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.080166
## final  value 981.080070
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.483616
## final  value 983.482758
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.826696
## final  value 978.822440
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.551399
## final  value 998.548682
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1013.720207
## iter  10 value 1013.720207
## iter  10 value 1013.720207
## final  value 1013.720207
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 981.038111
## final  value 981.034214
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.506556
## final  value 980.505869
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.162112
## iter  10 value 997.162108
## iter  10 value 997.162108
## final  value 997.162108
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.034806
## final  value 983.034411
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.895357
## final  value 985.894046
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.279561
## final  value 992.267156
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.188319
## final  value 990.188070
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.171045
## final  value 985.170964
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.339047
## final  value 981.311471
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.738503
## final  value 995.738054
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.876965
## final  value 983.876912
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.539417
## final  value 974.998862
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.726291
## final  value 975.721366
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.217249
## final  value 993.216543
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.020715
## final  value 972.999285
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.118404
## final  value 990.118244
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.661226
## final  value 987.661033
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.582161
## final  value 997.570104
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.816112
## final  value 978.815967
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.315694
## final  value 984.302503
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.383010
## final  value 990.382912
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 971.121147
```

```
## final  value 971.120655
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.542731
## final  value 989.252457
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 968.270047
## final  value 968.269942
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.267362
## final  value 986.260441
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.352112
## iter  10 value 998.352112
## iter  10 value 998.352112
## final  value 998.352112
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.447093
## final  value 982.442751
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 968.464359
## final  value 967.972328
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 969.425932
## final  value 969.421845
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.405777
## final  value 998.405728
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1010.952335
## final  value 1010.952324
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.915717
## final  value 972.941377
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.805349
## final  value 986.805286
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.122573
## iter  10 value 981.122572
## iter  10 value 981.122572
## final  value 981.122572
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.008431
## final  value 995.008255
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.883474
## final  value 986.774214
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.852648
## final  value 990.847123
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.743107
## final  value 983.743091
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.846372
## iter  10 value 988.846366
## iter  10 value 988.846366
## final  value 988.846366
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.669068
## final  value 980.668135
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.188072
## final  value 988.167372
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.714650
## final  value 978.714338
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.162771
## final  value 990.120673
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.858732
## final  value 986.849344
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.646120
## iter  10 value 986.646110
## iter  10 value 986.646110
## final  value 986.646110
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.179210
## final  value 990.179109
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.867657
## final  value 978.867078
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.443922
## final  value 991.441169
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.825623
## final  value 988.825312
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.186350
## final  value 978.185124
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.310942
## final  value 979.310639
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.131158
## final  value 983.127094
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 998.235367
## final  value 998.235081
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.887423
## final  value 989.879280
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.459650
## final  value 992.459632
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 996.321977
## iter  10 value 996.321977
## iter  10 value 996.321977
## final  value 996.321977
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1001.940948
## final  value 1001.940786
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.013324
## final  value 990.011702
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.045791
## final  value 978.038533
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.068650
## final  value 974.068153
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.599139
## final  value 980.598924
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.989642
## iter  10 value 997.989635
## iter  10 value 997.989635
## final  value 997.989635
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 986.049760
## final  value 986.049576
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.100172
## final  value 986.100051
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.338380
## final  value 995.336927
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.998579
## final  value 987.998552
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.145363
## final  value 975.140323
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1002.440654
## final  value 1002.440565
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.792166
## final  value 990.791269
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.296574
## iter  10 value 990.296573
## iter  10 value 990.296573
## final  value 990.296573
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.229750
## iter  10 value 999.229750
## iter  10 value 999.229750
## final  value 999.229750
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1001.592520
## final  value 1001.591321
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 981.675159
## final  value 981.675116
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1002.485755
## final  value 1002.484860
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.836772
## final  value 989.835773
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1013.264673
## iter  10 value 1013.264668
## iter  10 value 1013.264668
## final  value 1013.264668
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.275296
## final  value 981.269820
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.613053
## final  value 999.610997
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.505547
## final  value 977.505480
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 996.120851
## final  value 996.120826
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.291049
## final  value 987.289362
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.014580
## final  value 990.012160
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.370479
## final  value 997.370431
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.444783
## final  value 993.444721
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.381527
## iter  10 value 980.381526
## iter  10 value 980.381526
## final  value 980.381526
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.293690
## iter  10 value 998.293688
## iter  10 value 998.293688
## final  value 998.293688
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.918787
## final  value 975.913498
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.725043
## final  value 983.703877
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.011469
## final  value 987.010939
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.286424
## final  value 984.285537
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 970.727481
## final  value 970.713596
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 968.638136
## final  value 968.464067
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.825935
## final  value 990.825823
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.934536
## final  value 982.887848
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.049042
## final  value 983.701348
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.422456
## final  value 978.417040
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.503037
## final  value 997.502093
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.707450
## final  value 976.295726
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.822697
## final  value 999.822646
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 971.241399
## final  value 971.240667
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.665006
## final  value 985.664900
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.194645
## final  value 979.194511
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.631664
## final  value 987.628476
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.967377
```

```
## final  value 983.967175
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.357515
## final  value 999.348241
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1010.612480
## final  value 1010.610914
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.082347
## final  value 987.081246
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1002.370422
## final  value 1002.370106
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.271531
## final  value 983.271513
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.085894
## final  value 976.768699
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.611928
## final  value 980.611833
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.859342
## final  value 983.859229
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.766190
## final  value 983.762207
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.421800
## final  value 991.421680
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 986.174665
## final  value 986.168788
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.921132
## final  value 990.641491
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.657835
## final  value 987.657177
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.152743
## final  value 983.719683
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.271139
## final  value 984.271120
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.527033
## final  value 993.526996
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.157826
## final  value 975.155983
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.750691
## final  value 975.750424
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.014519
## final  value 973.737394
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 996.352335
## final  value 996.352323
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.495091
## final  value 993.494633
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 1004.066008
## final  value 1004.065574
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.909970
## final  value 995.909805
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.241372
## final  value 980.241342
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.053524
## final  value 976.053390
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.442016
## final  value 994.439278
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.549835
## final  value 991.542585
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.947342
## final  value 980.945634
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.562288
## final  value 972.906950
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 996.870406
## final  value 996.870327
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.316713
## final  value 997.315189
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.451087
## final  value 982.447296
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.177573
## final  value 987.166276
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.549395
## final  value 975.548999
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.480407
## final  value 984.072980
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.014108
## final  value 975.014046
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.718725
## final  value 982.703093
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.256258
## final  value 993.254540
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.281176
## final  value 986.280940
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.675366
## final  value 982.675311
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.284722
## final  value 977.639215
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1001.439645
## final  value 1001.439587
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.389603
## final  value 998.386248
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.772291
## final  value 987.772203
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.932679
## final  value 989.932140
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.437475
## final  value 982.426527
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.971553
## final  value 974.969620
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.867308
## final  value 984.799047
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.582769
## iter  10 value 981.582769
## iter  10 value 981.582769
## final  value 981.582769
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.702433
## final  value 998.702369
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.181194
## final  value 986.180842
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.025899
## final  value 984.020642
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.860617
## iter  10 value 989.860611
## iter  10 value 989.860611
## final  value 989.860611
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 996.407655
## final  value 996.407627
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 964.431775
## final  value 964.431249
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.868313
## final  value 986.867648
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.251599
## final  value 976.244870
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.172335
## final  value 988.168084
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.721730
## final  value 974.532246
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 965.389788
## final  value 965.385597
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1008.077033
## final  value 1008.076212
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.414278
## final  value 982.408360
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.725872
## final  value 980.252840
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.482677
```

```
## final  value 988.482621
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.856828
## final  value 985.856729
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.471521
## final  value 980.468210
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.711318
## final  value 985.705852
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.548642
## final  value 990.548625
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.550702
## final  value 974.550656
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.597237
## final  value 992.538260
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.011910
## final  value 990.368668
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.434908
## final  value 976.434292
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.654794
## iter  10 value 986.654789
## iter  10 value 986.654789
## final  value 986.654789
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.938183
## final  value 993.938166
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.979572
## final  value 997.974718
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.202572
## final  value 986.827065
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.829686
## final  value 988.828914
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.504632
## final  value 978.504377
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.766108
## final  value 997.761032
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.239070
## final  value 984.236197
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.135408
## final  value 993.135003
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.715381
## final  value 990.712947
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.709055
## final  value 979.606308
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.827040
## final  value 980.825947
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.914029
## final  value 989.913991
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 970.584788
## final  value 970.584618
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.038010
## final  value 986.037953
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.274899
## final  value 977.270164
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 972.555165
## final  value 972.379160
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.213745
## final  value 994.208044
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.178782
## final  value 987.830661
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.258617
## final  value 978.820209
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.048251
## final  value 999.042471
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.466579
## final  value 991.453089
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.272264
## final  value 985.271172
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.558958
```

```
## final  value 993.558394
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.748234
## final  value 993.743782
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.882640
## iter  10 value 978.882635
## iter  10 value 978.882635
## final  value 978.882635
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.722878
## final  value 981.722785
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.185423
## final  value 977.185199
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.291357
## final  value 991.815878
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 971.531884
## final  value 971.489450
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.042585
## final  value 980.602518
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.898308
## final  value 979.897868
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.138365
## final  value 979.138353
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.482121
## final  value 984.482108
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.806896
## final  value 980.802139
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.538063
## final  value 990.533323
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.122482
## final  value 997.122300
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.217312
## final  value 985.216303
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.547025
## final  value 988.546809
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.735137
## final  value 984.730438
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.913464
## final  value 990.913367
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.727523
## final  value 989.727405
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.904344
## final  value 978.903953
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.236545
## final  value 976.236354
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.961960
## final  value 982.134957
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.595892
## iter  10 value 990.595887
## iter  10 value 990.595887
## final  value 990.595887
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1004.495978
## final  value 1004.495762
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1001.266324
## final  value 1001.265417
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 970.857014
## final  value 970.490613
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.301006
## final  value 995.300795
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.495538
## final  value 984.261827
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.956393
## final  value 995.556466
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.092382
## final  value 983.092338
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.681623
## final  value 987.681566
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.462678
## final  value 983.462641
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 988.568777
## final  value 988.568213
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.458981
## final  value 976.447732
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.974004
## final  value 984.973835
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 969.472376
## final  value 967.799663
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.549739
## final  value 991.549567
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 969.578969
## final  value 969.511294
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.516276
## iter  10 value 995.516273
## iter  10 value 995.516273
## final  value 995.516273
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.580792
## final  value 997.580257
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.550151
## final  value 993.550141
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.991687
## final  value 974.981276
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.118951
```

```
## final  value 989.117947
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.909491
## final  value 976.909252
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 967.048932
## final  value 966.410941
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.062955
## final  value 986.062596
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 958.430349
## final  value 957.732388
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 968.185954
## final  value 968.184132
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 972.541975
## final  value 972.274787
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.492659
## final  value 987.492634
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 965.322735
## final  value 964.374135
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.786316
## final  value 976.779998
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1013.120864
## iter  10 value 1013.120855
## iter  10 value 1013.120855
## final  value 1013.120855
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.139839
## final  value 987.137251
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.869927
## final  value 992.869857
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.854506
## final  value 982.850809
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 969.729371
## final  value 969.727661
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.969260
## final  value 989.968836
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 954.480855
## final  value 954.473471
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.992854
## final  value 997.849281
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.836090
## final  value 986.834539
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1002.097357
## final  value 1002.097218
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.638307
## final  value 982.355918
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.168724
## iter  10 value 993.168718
```

```
## iter  10 value 993.168718
## final  value 993.168718
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.296524
## final  value 984.295940
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.698968
## final  value 994.690026
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.302431
## final  value 990.302089
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 996.501261
## final  value 996.501214
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.565149
## final  value 997.565052
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.392176
## final  value 990.392135
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.173708
## final  value 987.170756
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.512728
## final  value 979.461232
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.801264
## final  value 983.389548
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.435350
## final  value 990.426918
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 989.408797
## final  value 989.407541
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 972.993768
## final  value 972.975003
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.496343
## final  value 978.470256
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.121532
## final  value 981.119790
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.416811
## final  value 980.416717
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.258467
## final  value 983.258419
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.221002
## final  value 992.220983
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.219562
## final  value 982.219520
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 971.478788
## final  value 971.478739
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.137499
## final  value 977.136264
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.826869
## final  value 988.824177
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.812345
## final  value 988.812207
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.993219
## final  value 994.993005
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 970.583674
## final  value 970.583143
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.193479
## final  value 998.192885
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.176368
## iter  10 value 986.176366
## iter  10 value 986.176366
## final  value 986.176366
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.569358
## final  value 974.514424
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.853434
## final  value 984.851425
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.012492
## final  value 997.012367
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 967.057285
## final  value 967.042010
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.231171
## final  value 984.222836
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 994.077266
## final  value 994.076853
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.735244
## final  value 992.730811
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 970.055173
## final  value 969.792748
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.545889
## final  value 992.544884
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.647143
## final  value 994.646928
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.866412
## final  value 981.866337
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.692541
## final  value 985.692502
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 966.149498
## final  value 966.146267
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1003.620552
## final  value 1003.619228
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.908592
## final  value 977.905942
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1003.078637
## final  value 1003.078587
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 988.410963
## final  value 988.069336
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1005.701385
## iter  10 value 1005.701377
## iter  10 value 1005.701377
## final  value 1005.701377
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.654026
## iter  10 value 993.654017
## iter  10 value 993.654017
## final  value 993.654017
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 971.378624
## final  value 971.378505
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.480367
## final  value 978.472998
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.452590
## final  value 973.109614
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.116101
## final  value 975.115923
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.807957
## final  value 988.807624
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.678869
## final  value 980.677014
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.405213
## final  value 978.404915
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 973.263569
## iter  10 value 973.263563
## iter  10 value 973.263563
## final  value 973.263563
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 968.736631
## final  value 968.573456
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.956570
## final  value 985.956257
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 955.422636
## final  value 955.422387
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.392850
## final  value 974.392567
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.649689
## final  value 998.646103
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.469416
## final  value 982.469152
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.285837
## final  value 990.285181
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.207524
## final  value 984.196507
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.322796
## final  value 994.321785
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.017334
```

```
## final  value 979.992180
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.020054
## final  value 977.019929
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.482993
## iter  10 value 984.482992
## iter  10 value 984.482992
## final  value 984.482992
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.442909
## final  value 980.440593
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.082889
## final  value 995.077489
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.572818
## final  value 980.568923
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 967.077472
## final  value 966.705149
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.085747
## final  value 989.085560
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.876154
## final  value 985.876120
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.840532
## final  value 985.840095
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.249348
## final  value 985.248889
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.981153
## final  value 999.981082
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 968.465944
## final  value 968.464619
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 963.609238
## final  value 963.608392
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.378234
## final  value 988.377995
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 970.721035
## final  value 970.720828
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.680032
## final  value 975.679938
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.026410
## final  value 985.025250
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.190869
## final  value 982.188349
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.505938
## final  value 973.503500
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 959.946759
## final  value 959.535827
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1002.517940
## final  value 1002.504458
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.566254
## iter  10 value 997.566248
## iter  10 value 997.566248
## final  value 997.566248
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.364975
## final  value 994.362987
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.639670
## final  value 994.639460
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.750885
## final  value 988.065461
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 969.043601
## final  value 969.043232
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.625579
## final  value 984.622158
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.007276
## final  value 978.006007
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.765172
## final  value 981.763619
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.383696
## final  value 985.383581
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1004.566373
## iter  10 value 1004.566368
## iter  10 value 1004.566368
## final  value 1004.566368
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.312806
## final  value 994.312793
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.878596
## final  value 985.878582
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.604708
## final  value 993.604684
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.938596
## final  value 991.930324
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 968.383361
## final  value 968.375554
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.518053
## final  value 984.517780
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.439908
## final  value 987.439819
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.970835
## final  value 993.969206
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.276708
## final  value 985.276078
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1004.758125
## final  value 1004.757682
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.932077
```

```
## final  value 994.931863
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 972.815176
## final  value 972.740171
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.346444
## final  value 985.346399
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.487422
## final  value 973.973982
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1002.719984
## final  value 1002.719965
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.799570
## final  value 985.796917
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.403246
## final  value 992.401988
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1000.693830
## final  value 1000.693793
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1000.243493
## final  value 999.423862
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 997.184457
## final  value 997.184438
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.625310
## final  value 994.625078
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 1000.380669
## final  value 1000.380298
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 991.562150
## final  value 991.559757
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 955.035479
## final  value 955.034193
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.839306
## final  value 999.838841
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.695942
## final  value 992.695549
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.626425
## final  value 975.625423
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.434011
## final  value 984.433650
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.118751
## final  value 990.118506
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.026996
## final  value 984.018570
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.462833
## final  value 984.253417
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.112705
## final  value 984.112427
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 985.284894
## final  value 985.282301
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.807802
## iter  10 value 982.807792
## iter  10 value 982.807792
## final  value 982.807792
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.456819
## final  value 986.448843
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.831384
## final  value 990.830791
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.267400
## final  value 980.190089
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.087686
## final  value 978.087054
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.715961
## final  value 987.715746
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.538294
## final  value 987.534471
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1004.710869
## final  value 1004.710442
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 962.633965
## final  value 962.633219
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.510241
```

```
## final  value 975.504065
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.162501
## final  value 989.161900
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.927331
## final  value 987.927225
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 969.736188
## final  value 969.735324
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.809940
## final  value 981.809889
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.371220
## final  value 988.061516
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.161014
## final  value 974.160990
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.300693
## iter  10 value 975.300692
## iter  10 value 975.300692
## final  value 975.300692
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.441265
## final  value 982.431865
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.675158
## final  value 989.674229
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.526887
## final  value 992.520703
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.740951
## final  value 992.740914
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 996.092449
## final  value 996.092336
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 965.107551
## final  value 964.656937
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.318587
## final  value 987.316117
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.379029
## final  value 993.375983
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.549633
## final  value 986.549608
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1001.489586
## final  value 1001.489574
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.592489
## final  value 989.592339
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1000.877746
## iter  10 value 1000.877743
## iter  10 value 1000.877742
## final  value 1000.877742
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.158480
## final  value 999.157650
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 981.437158
## final  value 981.436550
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 994.915642
## final  value 994.431191
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.136329
## final  value 999.136312
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.330716
## final  value 984.330641
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 970.738872
## final  value 970.494666
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.108297
## final  value 985.099012
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 999.141205
## final  value 999.140864
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.966438
## final  value 980.878394
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.754246
## final  value 979.607675
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1001.277536
## final  value 1000.695772
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.590031
## final  value 989.589868
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 991.521995
## iter  10 value 991.521988
## iter  10 value 991.521988
## final  value 991.521988
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.886508
## final  value 982.886415
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.609387
## final  value 990.609323
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.059636
## final  value 982.572983
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.657710
## final  value 985.657657
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.309492
## final  value 987.309341
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.961425
## iter  10 value 984.961420
## iter  10 value 984.961420
## final  value 984.961420
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.574826
## final  value 985.571486
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.119398
## final  value 976.112474
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.941314
## final  value 985.933097
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 975.240195
## final  value 974.991766
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.236811
## final  value 986.229192
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 973.923079
## final  value 973.922364
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 971.821965
## iter  10 value 971.821963
## iter  10 value 971.821963
## final  value 971.821963
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.823492
## final  value 975.821577
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.375947
## final  value 992.375397
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.386089
## final  value 993.383434
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.540672
## final  value 985.540264
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.050456
## final  value 976.824284
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1002.561713
## iter  10 value 1002.561704
## iter  10 value 1002.561704
## final  value 1002.561704
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 968.559877
## final  value 968.559846
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 993.335352
## final  value 993.003032
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.070812
## final  value 977.070255
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.057293
## final  value 982.056836
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.952373
## final  value 990.952360
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.690172
## iter  10 value 981.690171
## iter  10 value 981.690171
## final  value 981.690171
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 967.358985
## final  value 967.341428
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.653896
## final  value 982.646972
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.874980
## final  value 984.874846
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.836555
## final  value 986.834504
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 996.077209
```

```
## final  value 996.065374
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.517501
## final  value 989.517490
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 969.679673
## final  value 969.574865
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.745665
## final  value 985.744205
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.288006
## final  value 981.045353
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.472116
## final  value 982.470440
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.802147
## iter  10 value 998.802139
## iter  10 value 998.802139
## final  value 998.802139
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.080041
## final  value 975.078147
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 966.494755
## final  value 966.494613
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.389795
## final  value 982.389748
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 959.547765
## final  value 959.504915
## converged
```

```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.099836
## final  value 977.099817
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.523556
## final  value 987.523202
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1001.818457
## iter  10 value 1001.818449
## iter  10 value 1001.818449
## final  value 1001.818449
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.147358
## final  value 979.146718
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 984.036073
## final  value 983.726506
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 988.097262
## final  value 988.097036
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.049543
## final  value 985.049466
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 956.189551
## final  value 956.091982
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.568359
## final  value 995.568335
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.192705
## final  value 979.298141
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
```

```
## iter  10 value 997.679458
## final  value 997.679439
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.151554
## final  value 980.151472
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.216033
## final  value 975.214315
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.225475
## final  value 985.223802
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.333233
## final  value 982.289386
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.599400
## iter  10 value 985.599393
## iter  10 value 985.599393
## final  value 985.599393
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 974.068615
## final  value 972.820400
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.188018
## final  value 990.187295
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 976.702036
## final  value 976.697065
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.097718
## final  value 979.088541
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.614873
## final  value 979.614794
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 978.402187
## final  value 978.401438
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.263123
## final  value 979.262690
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.186699
## iter  10 value 998.186699
## iter  10 value 998.186699
## final  value 998.186699
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1000.555113
## final  value 1000.554666
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.722221
## final  value 980.722026
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.523440
## final  value 986.129702
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.773581
## final  value 995.772748
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 992.694474
## final  value 992.694091
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 971.000110
## final  value 970.998447
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.560898
## final  value 980.390548
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 988.810756
## final  value 988.810673
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.126886
## final  value 982.696292
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.865070
## final  value 980.864812
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 972.688576
## final  value 972.658752
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 989.642118
## final  value 989.641203
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.312005
## final  value 990.311578
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.772446
## final  value 975.530356
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1002.319018
## iter  10 value 1002.319017
## iter  10 value 1002.319017
## final  value 1002.319017
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 967.144384
## final  value 967.144221
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.091828
## iter  10 value 982.091824
## iter  10 value 982.091823
## final  value 982.091823
## converged
## # weights:  12 (6 variable)
```

```
## initial  value 1037.090001
## iter  10 value 984.514471
## final  value 983.512513
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.992118
## final  value 982.991277
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 983.264770
## final  value 983.263229
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 969.068796
## final  value 969.068464
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 995.337881
## final  value 995.337797
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 1002.942997
## final  value 1002.942961
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.620726
## final  value 985.620474
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 975.152605
## final  value 975.148616
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 996.127430
## final  value 996.127386
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.518900
## final  value 980.518522
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 987.528705
## final  value 987.527386
## converged
```

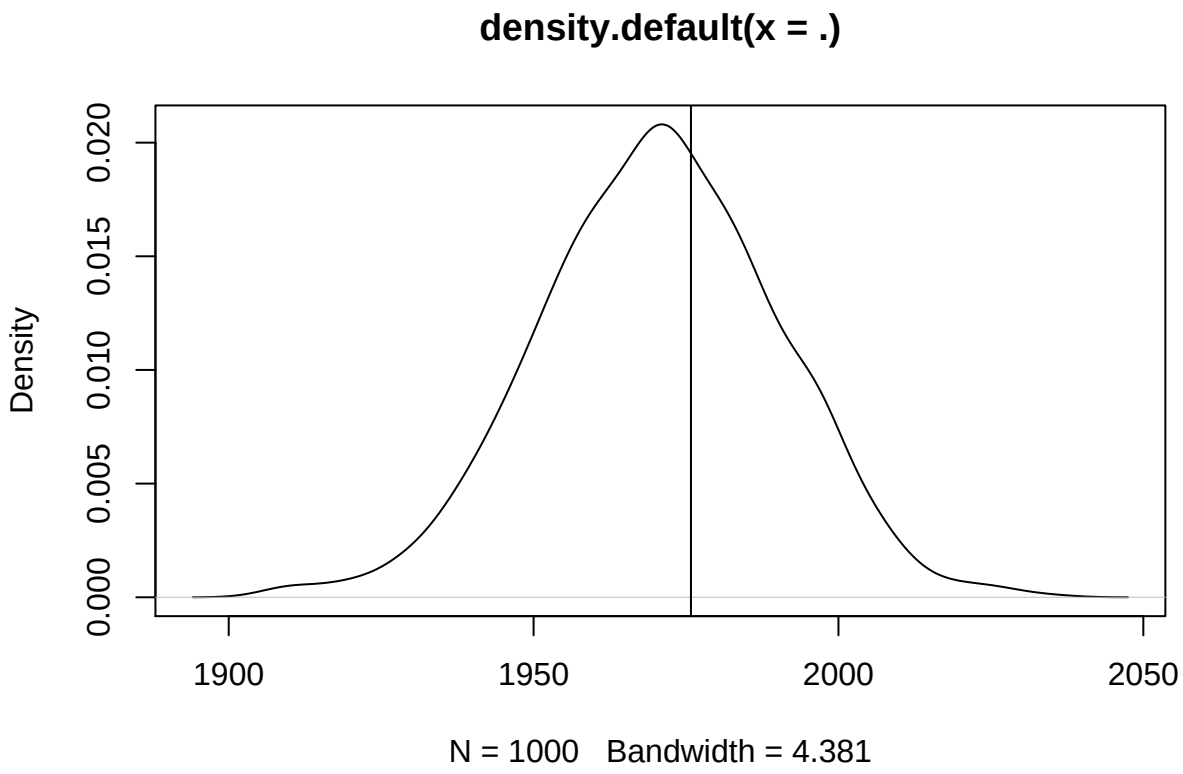
```
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.683613
## final  value 980.683254
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.788592
## final  value 986.785903
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 971.235126
## final  value 971.232879
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 985.518530
## final  value 985.515036
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 996.463396
## final  value 996.463078
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 998.282167
## final  value 998.281602
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 980.156202
## final  value 980.151139
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 970.977752
## final  value 970.976359
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 990.705836
## final  value 990.699235
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 977.848144
## final  value 977.841746
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 960.988395
## final  value 960.988341
```

```
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 979.252071
## final  value 979.251960
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 982.392324
## final  value 982.391584
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 981.183659
## final  value 980.659856
## converged
## # weights:  12 (6 variable)
## initial  value 1037.090001
## iter  10 value 986.442384
## final  value 985.939469
## converged
```

```
st
```

```
##    user  system elapsed
##   25.33    0.00   25.33
```

```
deviance.list %>% density %>% plot()
abline(v=deviance(mmod1))
```




```
pvalue <- mean(deviance.list>deviance(mmod1))
pvalue
```

```
## [1] 0.386
```

Unable to reject