

Process vcf file for multivariate simulations

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Libraries

```
#libraries_needed <- c("vcfR", "distances", "ggplot2", "fields", "stringr", "vegan", "robust", "mutnorm"
libraries_needed <- c("vcfR", "vegan", "ggplot2", "viridis", "gplots", "corrplot", "RANN",
                      "LEA", "gridExtra", "lfmm")

for (i in 1:length(libraries_needed)){
  # library( libraries_needed[i], character.only = TRUE, lib.loc = "/home/lotterhos/R/x86_64-pc-linux-gnu")
  #library(libraries_needed[i], character.only = TRUE, lib.loc = "/home/lotterhos/miniconda3/envs/MVP_en
  library(libraries_needed[i],character.only = TRUE) #laptop
}

## *****
## This is vcfR 1.13.0
##   browseVignettes('vcfR') # Documentation
##   citation('vcfR') # Citation
## *****
## *****
## Loading required package: permute

## Loading required package: lattice

## This is vegan 2.6-4

## Loading required package: viridisLite

##
## Attaching package: 'gplots'

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

## corrplot 0.92 loaded

##
## Attaching package: 'LEA'

## The following object is masked from 'package:lattice':
##   barchart
```

```
knitr::opts_knit$set(root.dir = "~/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_multisim")
```

```
path <- "~/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_multisim/" #setwd("~/work/lotterhos/MVP-NonClinalAF") #OOD setwd(path)
```

Load VCF and data files

```
path <- "~/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_multisim/"  
seed <- 892657863  
vcf_full <- read.vcfR(paste0(path, seed, "_plusneut_MAF01.recode2.vcf.gz"))
```

```
## Scanning file to determine attributes.  
## File attributes:  
##   meta lines: 5  
##   header_line: 6  
##   variant count: 29387  
##   column count: 8605  
## Meta line 5 read in.  
## All meta lines processed.  
## gt matrix initialized.  
## Character matrix gt created.  
##   Character matrix gt rows: 29387  
##   Character matrix gt cols: 8605  
##   skip: 0  
##   nrows: 29387  
##   row_num: 0  
## Processed variant 1000Processed variant 2000Processed variant 3000Processed variant 4000Processed variant  
## All variants processed
```

```
vcf_mutns <- read.vcfR(paste0(path, seed, "_VCF_causal.vcf"))
```

```
## Scanning file to determine attributes.  
## File attributes:  
##   meta lines: 13  
##   header_line: 14  
##   variant count: 354  
##   column count: 8605  
## Meta line 13 read in.  
## All meta lines processed.  
## gt matrix initialized.  
## Character matrix gt created.  
##   Character matrix gt rows: 354  
##   Character matrix gt cols: 8605  
##   skip: 0  
##   nrows: 354  
##   row_num: 0  
## Processed variant: 354  
## All variants processed
```

```

indPhen_df <- read.table(paste0(path,seed,"_ind.txt"), header=TRUE)
indPhen_df$indID <- 1:nrow(indPhen_df)

throughtime <- read.table(paste0(path,seed,"_throughtime.txt"), header=TRUE)

muts_df <- read.table(paste0(path,seed,"_muts.txt"), header=TRUE)

adp_env <- read.table("../bioclim/adaptive_env.txt", header=TRUE)
ext_env <- read.table("../bioclim/nuisance_env.txt", header=TRUE)
bioclim <- read.table("../bioclim/bioclim.txt", header=TRUE)

```

GGtheme

```

ggtheme <- theme_bw() + theme(panel.grid.major = element_blank(), panel.grid.minor = element_blank(),
                               axis.line = element_line(colour="grey20"), axis.title = element_text(colour="grey20"),
                               legend.title = element_text(colour="grey20"), legend.text = element_text(colour="grey20"))

```

Sanity check - orientation of environments

```
tail(throughtime)
```

```

##      sim.generation num_muts num_ind mean.phenotype1.mat mean.phenotype2.MTWetQ
## 45          9000      361     8624      -0.0185452      -1.78055e-03
## 46          9200      363     8635      -0.0138246      -2.44619e-03
## 47          9400      368     8606      -0.0198771      1.30746e-07
## 48          9600      368     8607      -0.0197691      -6.29428e-03
## 49          9800      337     8492      -0.0225425      -2.50511e-04
## 50         10000      354     8596      -0.0201866      -5.01022e-03
##      mean.phenotype3.MTDQ mean.phenotype4.PDM mean.phenotype5.PwarmQ
## 45          -0.0228846      -0.00234522      0.0214446
## 46          -0.0219562      -0.00200202      0.0157077
## 47          -0.0247648      -0.00611703      0.0216801
## 48          -0.0231567      -0.00783477      0.0147295
## 49          -0.0284869      -0.00389418      0.0264394
## 50          -0.0245633      -0.00207077      0.0168764
##      mean.phenotype6.PWM sd.phenotype1.mat sd.phenotype2.MTWetQ
## 45          -0.002104780      0.300166      0.346964
## 46          -0.003506380      0.302931      0.343768
## 47          -0.000251952      0.302298      0.347386
## 48          -0.005924770      0.299461      0.343905
## 49          0.004707770      0.297080      0.347101
## 50          -0.002050610      0.304379      0.347613
##      sd.phenotype3.MTDQ sd.phenotype4.PDM sd.phenotype5.PwarmQ sd.phenotype6.PWM
## 45          0.299483      0.333457      0.333447      0.318255
## 46          0.304138      0.330964      0.336028      0.321183
## 47          0.305316      0.334049      0.338383      0.321802
## 48          0.303110      0.328418      0.337579      0.321918
## 49          0.304989      0.334200      0.340306      0.322131
## 50          0.302564      0.330399      0.337779      0.322758
##      corr_phen_env_1mat corr_phen_env_2MTWetQ corr_phen_env_3MTDQ

```

```

## 45          0.918192          0.968499          0.941545
## 46          0.918878          0.969611          0.946905
## 47          0.922121          0.970056          0.945248
## 48          0.923127          0.969937          0.949468
## 49          0.921609          0.971164          0.947754
## 50          0.920422          0.969746          0.947248
##   corr_phen_env_4PDM corr_phen_env_5PwarmQ corr_phen_env_6PWM
## 45          0.968061          0.976967          0.966933
## 46          0.968431          0.977606          0.967679
## 47          0.968298          0.977212          0.967498
## 48          0.968549          0.977384          0.968107
## 49          0.969287          0.979505          0.967650
## 50          0.968022          0.978508          0.966672

```

```
head(indPhen_df)
```

```

##      seed ind_index      x      y phenotype1_mat phenotype2_MTWetQ
## 1 892657863      0 0.733354 0.099541 -0.1235820 -0.3066800
## 2 892657863      1 0.728865 0.192011  0.0155480 -0.4308770
## 3 892657863      2 0.370838 0.424631  0.2749810 -0.2833580
## 4 892657863      3 0.267083 0.769019  0.0255684 -0.3017240
## 5 892657863      4 0.642661 0.776228 -0.4432000  0.2311960
## 6 892657863      5 0.959262 0.208790 -0.1882950 -0.0365598
## phenotype3_MTDQ phenotype4_PDM phenotype5_PwarmQ phenotype6_PWM env1_mat
## 1      0.7317760      0.4617900     -0.03751700  0.4726730  0.0262576
## 2      0.1004170      0.5377430     -0.00966542  0.5207820 -0.0188616
## 3      0.0250827     -0.1053030     -0.22063000 -0.2879880  0.3562040
## 4      0.0207409      0.5693000     0.37509700  0.2728360  0.0632020
## 5     -0.4190600      0.0802502     0.23873400 -0.0212566 -0.4083260
## 6      0.0570135      0.1040740     -0.06018340 -0.0418681 -0.2010620
## env2_MTWetQ env3_MTDQ env4_PDM env5_PwarmQ env6_PWM indID
## 1     -0.3042980     0.6448770     0.4926010  -0.0528437  0.4280540    1
## 2     -0.3263850     0.1203820     0.4793460  -0.0102088  0.4663140    2
## 3     -0.2592700     0.0851666    -0.1477330  -0.2604940 -0.3400270    3
## 4     -0.3094960     0.1726670     0.5262580  0.3720160  0.3132860    4
## 5      0.2325500    -0.3789780   -0.0424752  0.2130940 -0.0580471    5
## 6      0.0714637     0.1606620     0.1026040  -0.0157558  0.0338467    6

```

```

## Correlations between evolved phenotype and the environment
cor(indPhen_df$phenotype1_mat, indPhen_df$env1_mat)

```

```
## [1] 0.920422
```

```
cor(indPhen_df$phenotype2_MTWetQ, indPhen_df$env2_MTWetQ)
```

```
## [1] 0.9697462
```

```
cor(indPhen_df$phenotype3_MTDQ, indPhen_df$env3_MTDQ)
```

```
## [1] 0.9472477
```

```
cor(indPhen_df$phenotype4_PDM, indPhen_df$env4_PDM)
```

```
## [1] 0.9680222
```

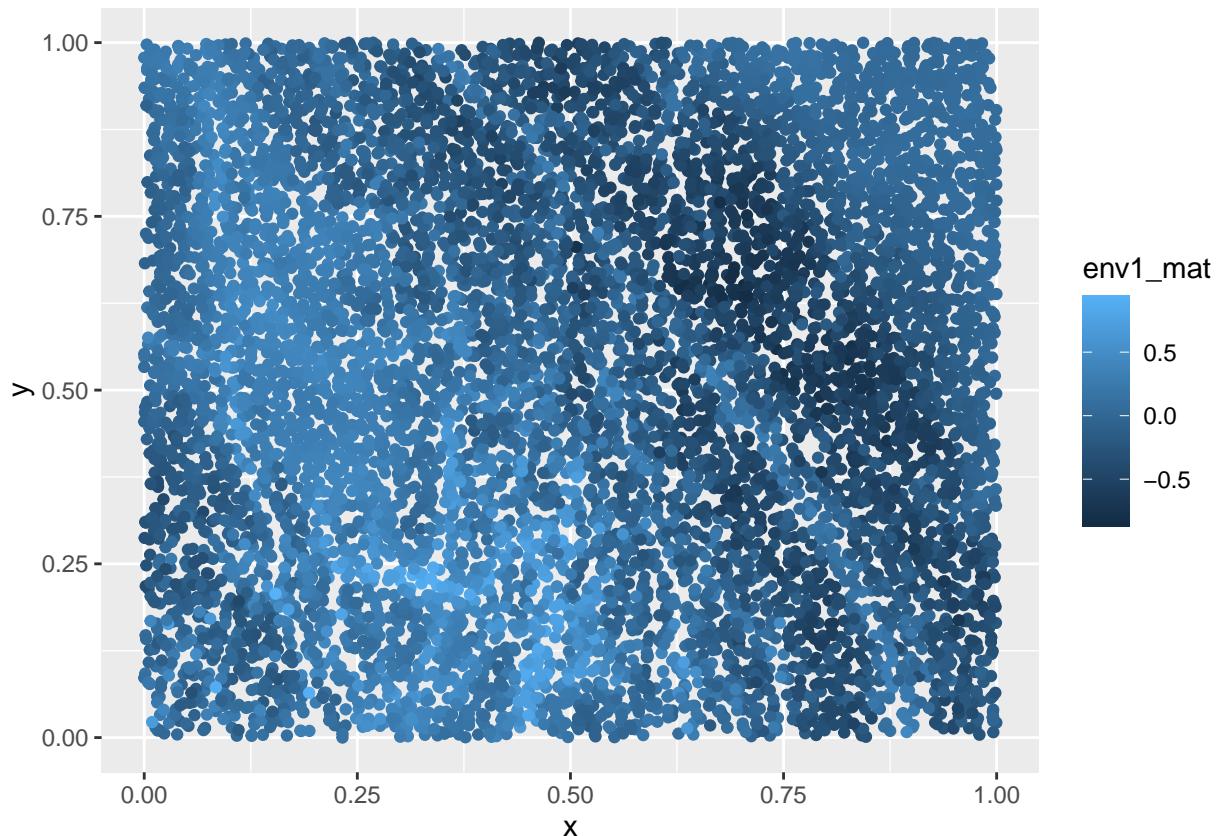
```
cor(indPhen_df$phenotype5_PwarmQ, indPhen_df$env5_PwarmQ)
```

```
## [1] 0.9785076
```

```
cor(indPhen_df$phenotype6_PWM, indPhen_df$env6_PWM)
```

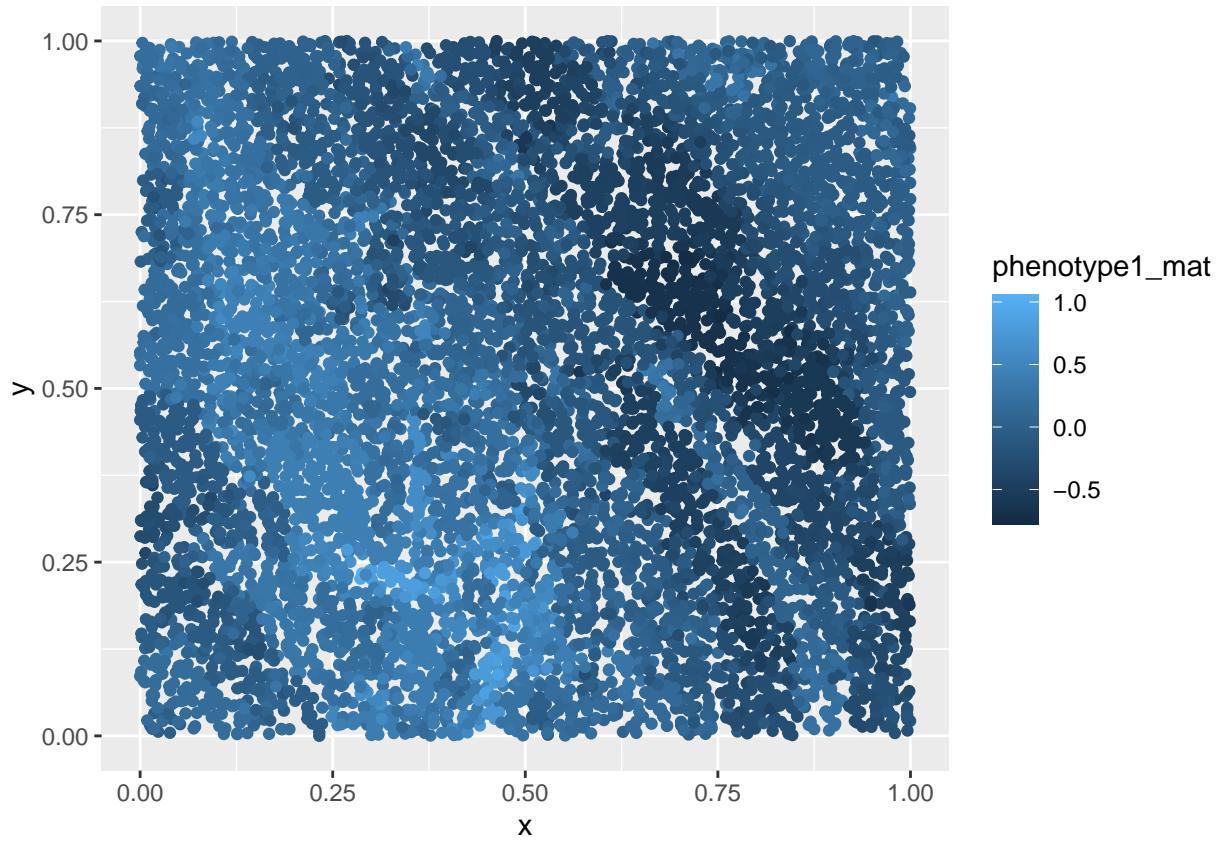
```
## [1] 0.9666724
```

```
# plot the environment in the output  
ggplot(indPhen_df) + geom_point(aes(x, y, color=env1_mat))
```



```
# plot the phenotypes of the individuals
```

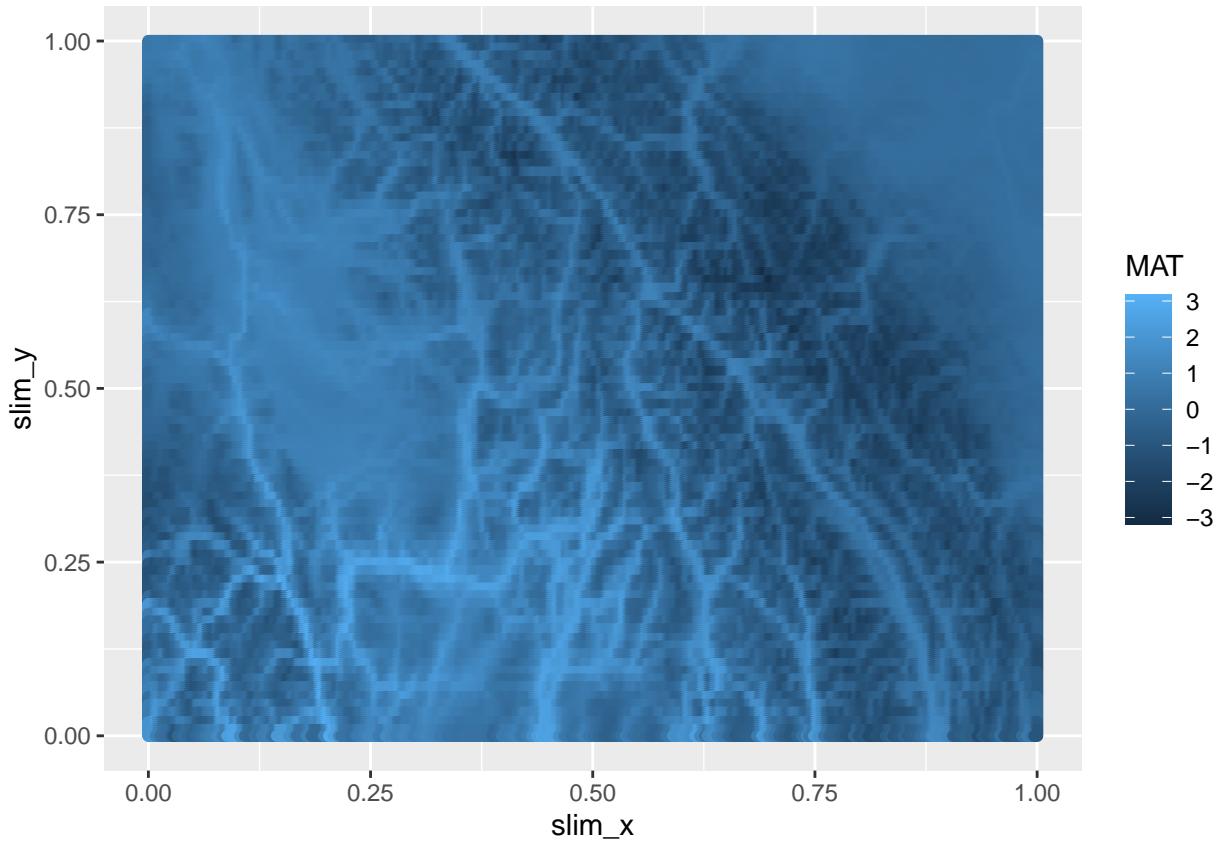
```
ggplot(indPhen_df) + geom_point(aes(x, y, color=phenotype1_mat))
```



```
head(adp_env) # this is what was input to SLIM
```

```
##           x      y      MAT     MTWetQ      MTDQ      PWM      PDM
## 360 -123.192 53.408 0.6300150 1.253459 -0.012166195 -1.0131748 -0.9962333
## 720 -123.169 53.408 0.6300150 1.253459 -0.012166195 -1.0131748 -0.9962333
## 1080 -123.145 53.408 0.7095763 1.274450  0.029013211 -1.0131748 -0.9962333
## 1440 -123.122 53.408 0.6697956 1.263954  0.008423508 -1.0131748 -0.9147304
## 1800 -123.099 53.408 0.6697956 1.263954  0.008423508 -1.0131748 -0.9147304
## 2160 -123.075 53.408 0.6697956 1.263954  0.008423508 -0.9718891 -0.9147304
##          PWarmQ    slim_x  slim_y
## 360 -0.4048526 0.000000000 1
## 720 -0.4048526 0.002743648 1
## 1080 -0.3838182 0.005606585 1
## 1440 -0.3627838 0.008350233 1
## 1800 -0.3627838 0.011093880 1
## 2160 -0.3417493 0.013956817 1
```

```
ggplot(adp_env) + geom_point(aes(slim_x, slim_y, color=MAT))
```



Add information to SNPs and individuals

```

geno_full <- vcf_full@gt[,-1]
dim(geno_full)

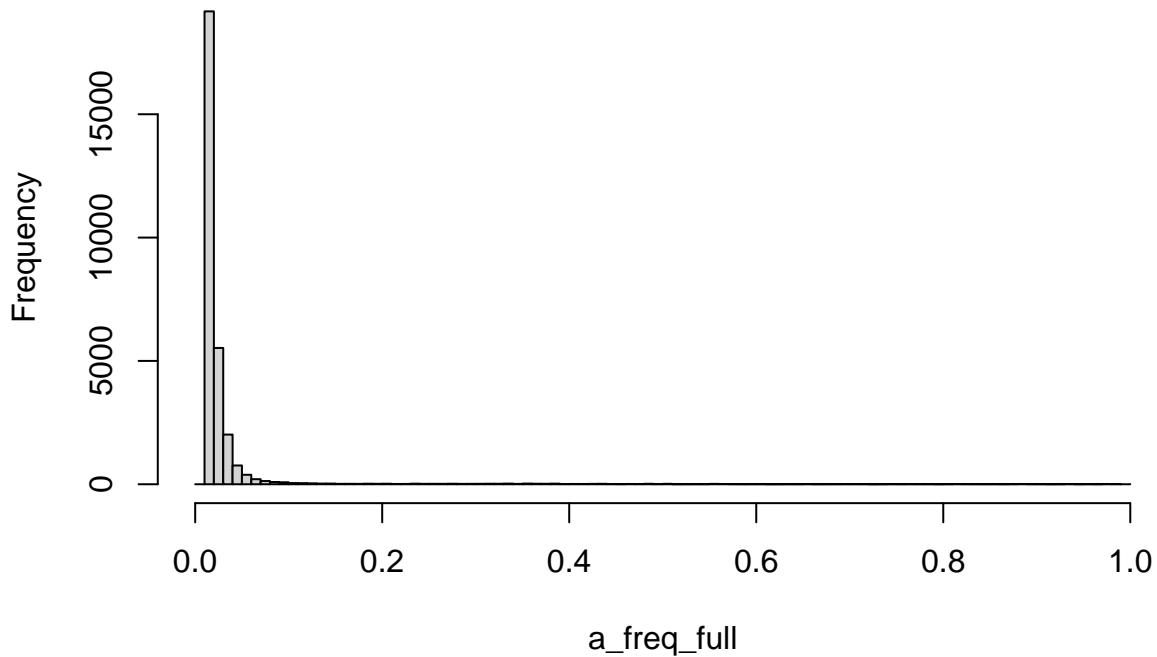
## [1] 29387 8596

position_full <- getPOS(vcf_full)
rown <- vcf_full@fix[, "ALT"] # mutation ID
causal_mut_locs <- which(rown %in% as.character(muts_df$mutID)) # causal mutations
G_full <- matrix(NA, nrow = nrow(geno_full), ncol = ncol(geno_full))
G_full[geno_full %in% c("0/0", "0|0")] <- 0
G_full[geno_full %in% c("0/1", "1/0", "1|0", "0|1")] <- 1
G_full[geno_full %in% c("1/1", "1|1")] <- 2

a_freq_full <- rowSums(G_full)/(2*ncol(G_full))
hist(a_freq_full, breaks=seq(0,1,0.01))

```

Histogram of a_freq_full



```
if (!identical(sort(unique(unlist(as.numeric(G_full)))), as.numeric(0:2))){  
  print("Error: full genotype matrix not uniquely 012")  
  break  
}
```

Subsampling individuals from landscape

```
indPhen_df$subset <- FALSE  
set.seed(9801235)  
whichinds <- sort(sample(1:nrow(indPhen_df), size=1000, replace=FALSE))  
indPhen_df$subset[whichinds] <- TRUE  
sum(indPhen_df$subset) #sanity check  
  
## [1] 1000  
  
G_full_subset <- G_full[,which(indPhen_df$subset)]
```

Assign Linkage groups

```
# Assign loci to LG groups  
numLGs <- ceiling(max(as.numeric(vcf_full@fix[, "POS"]))/50000)  
for (LG in 1:numLGs){  
  sites_low <- (LG-1)*50000+1  
  sites_high <- (LG)*50000
```

```

pos <- as.numeric(vcf_full@fix[, "POS"])
whichlocs <- pos >= sites_low & pos <= sites_high
vcf_full@fix[whichlocs, "CHROM"] <- as.numeric(LG)
}
table(vcf_full@fix[, "CHROM"])

##          1   10   11   12   13   14   15   16   17   18   19   2   20   3   4   5
## 1491 1493 1469 1419 1536 1485 1450 1450 1479 1518 1488 1434 1474 1463 1529 1419
##          6    7    8    9
## 1435 1452 1423 1480

# Assign unique names to each locus
head(vcf_full@fix)

##      CHROM POS ID REF ALT QUAL FILTER INFO
## [1,] "1"   "8" NA "0" "1" NA   "PASS" NA
## [2,] "1"   "27" NA "0" "1" NA   "PASS" NA
## [3,] "1"   "34" NA "0" "1" NA   "PASS" NA
## [4,] "1"   "81" NA "0" "1" NA   "PASS" NA
## [5,] "1"   "97" NA "0" "1" NA   "PASS" NA
## [6,] "1"   "153" NA "0" "1" NA   "PASS" NA

vcf_full@fix[,"INFO"] <- paste0(vcf_full@fix[, "CHROM"], "-", vcf_full@fix[, "POS"])
if (sum(duplicated(vcf_full@fix[, "POS"]))>0){
  dups <- which(duplicated(vcf_full@fix[, "POS"]))
  vcf_full@fix[dups, "INFO"] <- paste0(vcf_full@fix[dups, "INFO"], "_2")
}
b <- 3
while (sum(duplicated(vcf_full@fix[, "INFO"]))>0){
  dups <- which(duplicated(vcf_full@fix[, "INFO"]))
  vcf_full@fix[dups, "INFO"] <- gsub(paste0("_", b-1),
                                         paste0("_", b),
                                         x = vcf_full@fix[dups, "INFO"])
  b <- b+1
  if (b==10){print("problem in naming loci"); break}
}

# Check duplicated locus names
if(sum(duplicated(vcf_full@fix[dups, "INFO"]))>0){print("Error: duplicate locus names");break}

head(vcf_full@fix)

##      CHROM POS ID REF ALT QUAL FILTER INFO
## [1,] "1"   "8" NA "0" "1" NA   "PASS" "1-8"
## [2,] "1"   "27" NA "0" "1" NA   "PASS" "1-27"
## [3,] "1"   "34" NA "0" "1" NA   "PASS" "1-34"
## [4,] "1"   "81" NA "0" "1" NA   "PASS" "1-81"
## [5,] "1"   "97" NA "0" "1" NA   "PASS" "1-97"
## [6,] "1"   "153" NA "0" "1" NA   "PASS" "1-153"

```

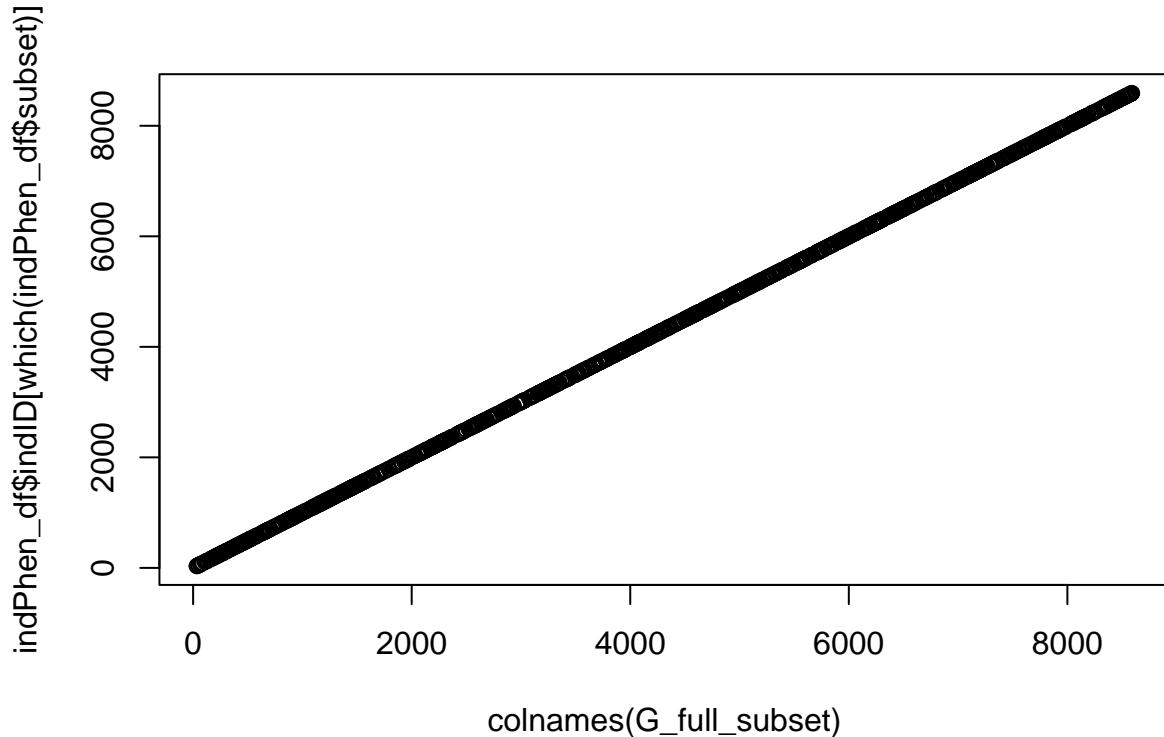
```
rownames(G_full_subset) = vcf_full@fix[, "INFO"]
```

Add individual and locus names to G_full subset

```
colnames(G_full_subset) = indPhen_df$indID[which(indPhen_df$subset)]
head(G_full_subset[, 1:5])
```

```
##      34 35 45 46 47
## 1-8    0  0  0  0  0
## 1-27   0  0  0  0  0
## 1-34   0  0  0  0  0
## 1-81   0  0  0  0  0
## 1-97   0  0  0  0  0
## 1-153  0  0  0  0  0
```

```
plot(colnames(G_full_subset), indPhen_df$indID[which(indPhen_df$subset)])
```



```
## Mutation stuff
a_freq_subset <- as.numeric(rowSums(G_full_subset)/(2*ncol(G_full_subset)))
# should have 1000 individuals
#hist(a_freq_subset)

muts_full10 <- data.frame(seed = as.character(seed),
                            VCFrow = 1:nrow(vcf_full@gt),
                            mutID = vcf_full@fix[, "ALT"],
                            LG = as.integer(vcf_full@fix[, "CHROM"])),
```

```

pos_pyslim = as.integer(vcf_full@fix[, "POS"]),
mutname = vcf_full@fix[, "INFO"],
a_freq_full = a_freq_full,
a_freq_subset = a_freq_subset)

if(!identical(rownames(G_full_subset), muts_full0$mutname)){Print("Error mut names out of order");break}

head(muts_full0)

##      seed VCFrow mutID LG pos_pyslim mutname a_freq_full a_freq_subset
## 1 892657863     1    1       8   1-8  0.01442531  0.0175
## 2 892657863     2    1      27   1-27  0.01384365  0.0120
## 3 892657863     3    1      34   1-34  0.03530712  0.0370
## 4 892657863     4    1      81   1-81  0.03187529  0.0330
## 5 892657863     5    1      97   1-97  0.02030014  0.0170
## 6 892657863     6    1     153   1-153 0.01692648  0.0225

dim(muts_full0)

## [1] 29387     8

muts_full0$mutID <- as.character(muts_full0$mutID) # all loci, but only causal loci have unique ID
muts_df$mutID <- as.character(muts_df$mutID) #only causal loci, unique ID from SlIM

muts_full <- merge(muts_full0, muts_df, by=c("mutID", "seed"), all.x=TRUE)
muts_full <- muts_full[order(muts_full$VCFrow),]
head(muts_full)

##      mutID      seed VCFrow LG pos_pyslim mutname a_freq_full a_freq_subset
## 1 1 892657863     1    1       8   1-8  0.01442531  0.0175
## 2 1 892657863     2    1      27   1-27  0.01384365  0.0120
## 3 1 892657863     3    1      34   1-34  0.03530712  0.0370
## 4 1 892657863     4    1      81   1-81  0.03187529  0.0330
## 5 1 892657863     5    1      97   1-97  0.02030014  0.0170
## 6 1 892657863     6    1     153   1-153 0.01692648  0.0225

##      muttype p mut1.mat.Effect mut2.MTWetQ.Effect mut3_MTDQ.Effect
## 1 <NA> NA NA NA NA
## 2 <NA> NA NA NA NA
## 3 <NA> NA NA NA NA
## 4 <NA> NA NA NA NA
## 5 <NA> NA NA NA NA
## 6 <NA> NA NA NA NA

##      mut4_PDM.Effect mut5_PwarmQ.Effect mut6_PWM.Effect
## 1 NA NA NA
## 2 NA NA NA
## 3 NA NA NA
## 4 NA NA NA
## 5 NA NA NA
## 6 NA NA NA

```

```

dim(muts_full)

## [1] 29387    16

if(!identical(rownames(G_full_subset), muts_full$mutname)){Print("Error mut names out of order");break}
# Are there any missing values for LG?
if(sum(is.na(muts_full$LG))>0){Print("Error: Missing LGs"); break}

```

Add effect sizes to muts table

```

head(muts_full)

##   mutID      seed VCFrow LG pos_pyslim mutname a_freq_full a_freq_subset
## 1     1 892657863     1 1          8  1-8  0.01442531  0.0175
## 2     1 892657863     2 1         27  1-27  0.01384365  0.0120
## 3     1 892657863     3 1          34  1-34  0.03530712  0.0370
## 4     1 892657863     4 1          81  1-81  0.03187529  0.0330
## 5     1 892657863     5 1          97  1-97  0.02030014  0.0170
## 6     1 892657863     6 1         153 1-153  0.01692648  0.0225
##   muttype p mut1.mat.Effect mut2.MTWetQ.Effect mut3_MTDQ.Effect
## 1 <NA> NA           NA           NA           NA
## 2 <NA> NA           NA           NA           NA
## 3 <NA> NA           NA           NA           NA
## 4 <NA> NA           NA           NA           NA
## 5 <NA> NA           NA           NA           NA
## 6 <NA> NA           NA           NA           NA
##   mut4_PDM.Effect mut5_PwarmQ.Effect mut6_PWM.Effect
## 1       NA           NA           NA
## 2       NA           NA           NA
## 3       NA           NA           NA
## 4       NA           NA           NA
## 5       NA           NA           NA
## 6       NA           NA           NA

muts_full$mut1.mat.Effect <- as.numeric(muts_full$mut1.mat.Effect)
muts_full$mut2.MTWetQ.Effect <- as.numeric(muts_full$mut2.MTWetQ.Effect)
muts_full$mut3_MTDQ.Effect <- as.numeric(muts_full$mut3_MTDQ.Effect)
muts_full$mut4_PDM.Effect <- as.numeric(muts_full$mut4_PDM.Effect)
muts_full$mut5_PwarmQ.Effect <- as.numeric(muts_full$mut5_PwarmQ.Effect)
muts_full$mut6_PWM.Effect <- as.numeric(muts_full$mut6_PWM.Effect)
muts_full$causal <- FALSE
muts_full$causal[muts_full$mutID!=1] <- TRUE
sum(muts_full$causal)

## [1] 92

```

FILTER OUT ALLELS WITH MAF < 0.01 AFTER SAMPLING

```

if(!identical(as.character(muts_full$mutname), as.character(rownames(G_full_subset)))){print("Error")}

#muts_full$isMAF01 <- FALSE
rm_loci <- which(muts_full$a_freq_subset < 0.01 | muts_full$a_freq_subset > 0.99)
#muts_full$isMAF01[rm_loci] <- rep(TRUE, length=length(rm_loci))

num_multiallelic <- sum((!complete.cases(G_full_subset)))
rm_loci <- sort(c(rm_loci, which(!complete.cases(G_full_subset)))))

numCausalLowMAFsample <- sum(muts_full$a_freq_subset < 0.01 & muts_full$causal)

# Filter out MAF loci from G_full_subset

if(length(rm_loci)>0){
  G_full_subset <- G_full_subset[-rm_loci,]
  muts_full <- muts_full[-rm_loci,]
}
if(!identical(as.character(muts_full$mutname), as.character(rownames(G_full_subset)))){print("Error")}

dim(G_full_subset)

## [1] 26371 1000

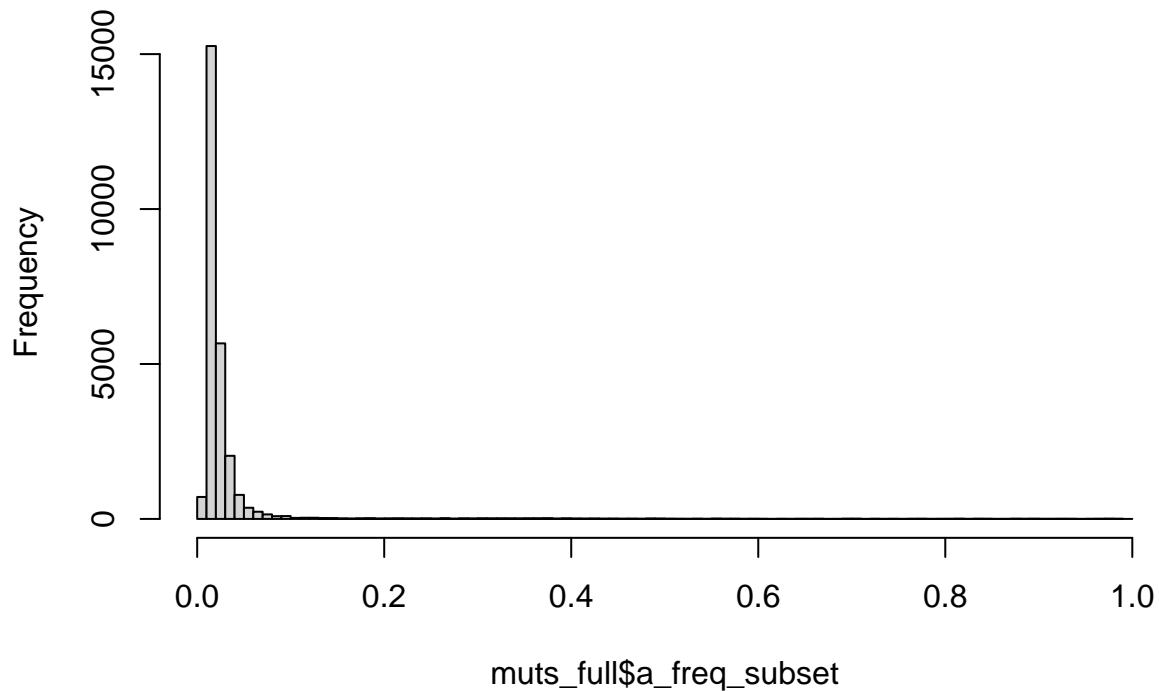
head(G_full_subset[,1:10])

##      34 35 45 46 47 65 66 73 86 107
## 1-8    0  0  0  0  0  2  0  0  0   0
## 1-27   0  0  0  0  0  0  0  0  0   0
## 1-34   0  0  0  0  0  0  0  0  0   0
## 1-81   0  0  0  0  0  0  0  0  0   0
## 1-97   0  0  0  0  0  0  0  0  0   0
## 1-153  0  0  0  0  0  0  0  0  0   0

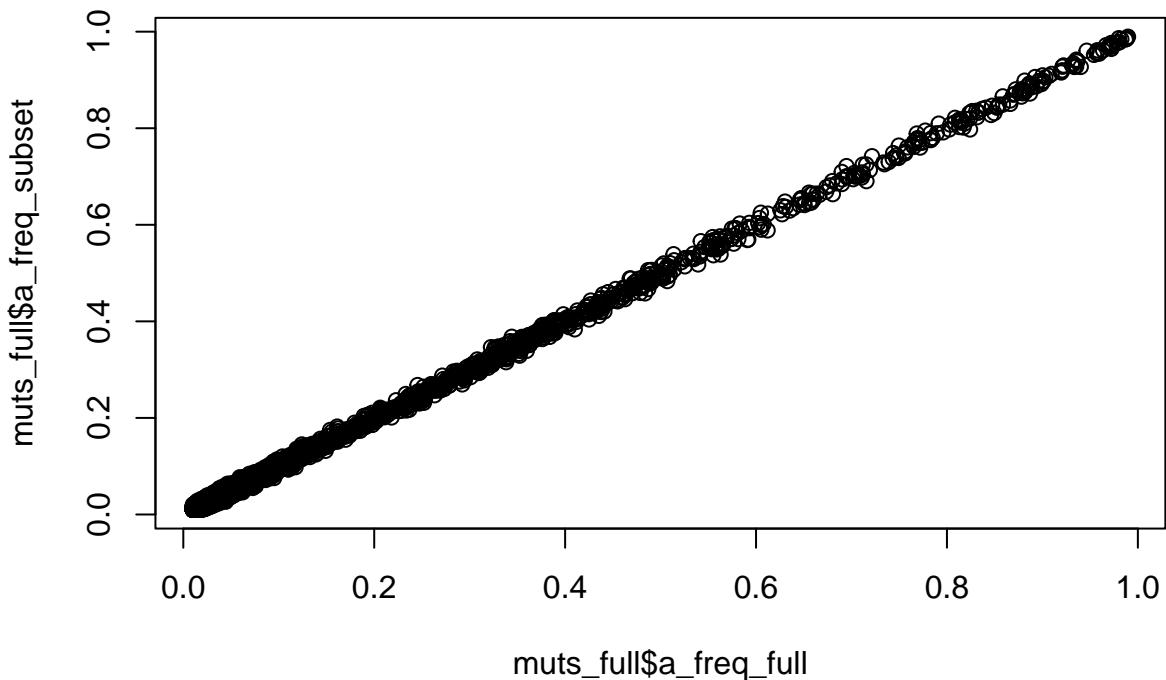
hist(muts_full$a_freq_subset, breaks=seq(0,1,0.01)) #After MAF

```

Histogram of muts_full\$a_freq_subset



```
plot(muts_full$a_freq_full, muts_full$a_freq_subset) #sanity check
```



```
dim(G_full_subset)
```

```
## [1] 26371 1000
```

Correlation plots

```

plotmain="Mutivariate simulation"
mut_effect_cols <- c("mut1.mat.Effect", "mut2.MTWetQ.Effect",
                      "mut3_MTDQ.Effect", "mut4_PDM.Effect",
                      "mut5_PwarmQ.Effect", "mut6_PWM.Effect")

which_mut_effect_cols <- which(colnames(muts_full) %in% mut_effect_cols)

muteffect_cormat <- cor(muts_full[,which_mut_effect_cols], use = "complete.obs")

env_cormat <- cor(adp_env[,c(3,4,5,7,8,6)]) #hard coding

# Mutation effect size correlations vs. environmental correlations

colnames(muteffect_cormat) <- c("MAT effect size",
                                 "MTWetQ effect size",
                                 "MTDQ effect size",
                                 "PDM effect size",
                                 "PwarmQ effect size",
                                 "PWM effect size")
rownames(muteffect_cormat) <- colnames(muteffect_cormat)

#plot.new()
pdf("plots_MutEffectCorMat.pdf", width=7,height=5)
corrplot(muteffect_cormat, type = "upper", order = "original",
         tl.col = "black", tl.srt = 45)

corrplot(env_cormat, type = "upper", order = "original",
         tl.col = "black", tl.srt = 45)
dev.off()

```

```

## pdf
## 2

```

```

# Sanity check that muts_full mutations line up with G_full_subset
if(nrow(muts_full)!=nrow(G_full_subset)){print("Error 1: mutation data frames have different number of rows")}

num_causal_postfilter <- sum(muts_full$causal)
num_causal_prefilter <- nrow(vcf_muts@fix)
num_neut_postfilter <- sum(!muts_full$causal)
num_neut_prefilter <- sum((vcf_full@fix[, "ALT"]=="1"))

dim(G_full_subset)

## [1] 26371 1000

subset_indPhen_df <- indPhen_df[indPhen_df$subset,]

dim(subset_indPhen_df)

## [1] 1000 18

```

```

if(!identical(subset_indPhen_df$indID, sort(subset_indPhen_df$indID))){print("Error individuals in w

```

Correlations between allele frequency and environmental variables for all SNPs

This take a few minutes to run.

```

dim(G_full_subset[which(muts_full$causal),])

## [1] 90 1000

#muts <- G_full_subset[which(muts_full$causal),]

muts <- G_full_subset

dim(muts)

## [1] 26371 1000

mut_freq <- list()

#plot(sort(unique(MAT)), rep(0,18), ylim=c(0,1))

(env_cols <- grep("env", colnames(subset_indPhen_df)))

## [1] 11 12 13 14 15 16

# This code estimates the allele frequency for each value of the environmental variable
for (env in 1:6){
  print("start")
  ENVI <- round(subset_indPhen_df[,env_cols[env]], 1)
  mut_freq_ENV <- matrix(NA, nrow=nrow(muts), ncol=length(unique(ENVI)))
  colnames(mut_freq_ENV) <- sort(unique(ENVI))

  for (i in 1:nrow(muts)){
    tab <- t(table(ENVI, muts[i,]))
    num <- as.numeric(rownames(tab))
    a <- unlist(colSums(tab*num)/(colSums(tab)*2))
    mut_freq_ENV[i,] <- a
    #if(i%%3==0 | i%%4==0){mut_freq_ENV[i,] <- a}else{mut_freq_ENV[i,] <- 1-a}
    #print(i)
  }
  mut_freq[[env]] <- mut_freq_ENV
  print(env)
}

## [1] "start"
## [1] 1
## [1] "start"
## [1] 2
## [1] "start"

```

```

## [1] 3
## [1] "start"
## [1] 4
## [1] "start"
## [1] 5
## [1] "start"
## [1] 6

# Each item in this list is an environment
# Within each item is a matrix with rows corresponding to alleles
# and columns corresponding to the environmental variable

str(mut_freq) # The output is only for the QTN SNPs

```

```

## List of 6
## $ : num [1:26371, 1:18] 0 0 0 0.25 0.125 0 0 0 0 0 ...
## ..- attr(*, "dimnames")=List of 2
## ...$ : NULL
## ...$ : chr [1:18] "-0.8" "-0.7" "-0.6" "-0.5" ...
## $ : num [1:26371, 1:12] 0 0 0 0 0 0 0 0 0 0 ...
## ..- attr(*, "dimnames")=List of 2
## ...$ : NULL
## ...$ : chr [1:12] "-0.5" "-0.4" "-0.3" "-0.2" ...
## $ : num [1:26371, 1:20] 0 0 0 0 0 0 0 0 0 0 ...
## ..- attr(*, "dimnames")=List of 2
## ...$ : NULL
## ...$ : chr [1:20] "-0.7" "-0.6" "-0.5" "-0.4" ...
## $ : num [1:26371, 1:14] 0 0 0 0 0 0 0 0 0 0 ...
## ..- attr(*, "dimnames")=List of 2
## ...$ : NULL
## ...$ : chr [1:14] "-0.6" "-0.5" "-0.4" "-0.3" ...
## $ : num [1:26371, 1:16] 0 0 0 0 0 0 0 0 0 1 ...
## ..- attr(*, "dimnames")=List of 2
## ...$ : NULL
## ...$ : chr [1:16] "-0.8" "-0.7" "-0.6" "-0.5" ...
## $ : num [1:26371, 1:19] 0 0.571 0 0 0 ...
## ..- attr(*, "dimnames")=List of 2
## ...$ : NULL
## ...$ : chr [1:19] "-0.7" "-0.6" "-0.5" "-0.4" ...

```

```

#hist(mut_freq[[6]])
#length(mut_freq)

mut_cors <- matrix(NA, nrow=nrow(muts), ncol=6)
mut_Ps <- matrix(NA, nrow=nrow(muts), ncol=6)

for (i in 1:length(mut_freq)){
  env <- as.numeric(colnames(mut_freq[[i]]))
  for (j in 1:nrow(muts)){
    mut_cors[j,i] <- cor.test(env, mut_freq[[i]][j,])$est
    mut_Ps[j,i] <- cor.test(env, mut_freq[[i]][j,])$p.value
  }
}

```

Proportion of significant QTN clines after Bonferroni correction based the number of tests done on all SNPs

```

bonf <- 0.05/(nrow(G_full_subset))

mut_sigclines <- mut_Ps < bonf

# Proportion of SNPs in genome with clines for each environment
colSums(mut_sigclines)/nrow(muts)

## [1] 0.011338212 0.000000000 0.005536385 0.001099693 0.005688066 0.001365136

# proportion of QTNs with clines after correction for multiple tests
colSums(mut_sigclines[which(muts_full$causal),])/sum(muts_full$causal)

```

```
## [1] 0.01111111 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
```

Compare to Benjamini-Hochberg correction for multiple tests

```

mut_Ps_BH <- matrix(p.adjust(mut_Ps,method = "BH"), ncol=6)
mut_sigclines_BH <- mut_Ps_BH < 0.05
# sanity check plot(p.adjust(mut_Ps,method = "BH"), mut_Ps)

# Proportion of SNPs in genome with clines for each environment
colSums(mut_sigclines_BH)/nrow(muts)

## [1] 0.0827044860 0.0007963293 0.0248378901 0.0061051913 0.0286678548
## [6] 0.0048158962

# proportion of QTNs with clines after correction for multiple tests
colSums(mut_sigclines_BH[which(muts_full$causal),])/sum(muts_full$causal)

## [1] 0.10000000 0.00000000 0.05555556 0.00000000 0.04444444 0.00000000

```

Below the above numbers are compared to the outliers from LFMM univariate models at an FDR of 0.05, which doesn't necessarily correspond.

Visualize SNP frequency patterns across environmental clines

This plot draws each line randomly with a color and shape

This next function turns values into colors.

```

val2col<-function(z, zlim, col = turbo(100, begin=0, end=0.8), breaks){
  if(!missing(breaks)){
    if(length(breaks) != (length(col)+1)){stop("must have one more break than colour")}
  }
  if(missing(breaks) & !missing(zlim)){
    zlim[2] <- zlim[2]+c(zlim[2]-zlim[1])*1E-3 #adds a bit to the range in both directions
  }
}

```

```

zlim[1] <- zlim[1]-c(zlim[2]-zlim[1])*(1E-3)
breaks <- seq(zlim[1], zlim[2], length.out=(length(col)+1))
}
if(missing(breaks) & missing(zlim)){
  zlim <- range(z, na.rm=TRUE)
  zlim[2] <- zlim[2]+c(zlim[2]-zlim[1])*(1E-3)#adds a bit to the range in both directions
  zlim[1] <- zlim[1]-c(zlim[2]-zlim[1])*(1E-3)
  breaks <- seq(zlim[1], zlim[2], length.out=(length(col)+1))
}
CUT <- cut(z, breaks)
colorlevels <- col[match(CUT, levels(CUT))]# assign colors to heights for each point
return(colorlevels)
}

```

The following code draws each line with a color according to it's correlation between allele frequency and environment, and a solid line for non-clinal alleles and a dashed line for clinal alleles.

```

dim(mut_cors)

## [1] 26371      6

dim(mut_Ps_BH)

## [1] 26371      6

muts_causal <- muts[which(muts_full$causal),]
mut_cors_causal <- mut_cors[which(muts_full$causal),]
mut_Ps_causal <- mut_Ps_BH[which(muts_full$causal),]
str(mut_freq)

## List of 6
## $ : num [1:26371, 1:18] 0 0 0 0.25 0.125 0 0 0 0 0 ...
##   ..- attr(*, "dimnames")=List of 2
##     ...$ : NULL
##     ...$ : chr [1:18] "-0.8" "-0.7" "-0.6" "-0.5" ...
## $ : num [1:26371, 1:12] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "dimnames")=List of 2
##     ...$ : NULL
##     ...$ : chr [1:12] "-0.5" "-0.4" "-0.3" "-0.2" ...
## $ : num [1:26371, 1:20] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "dimnames")=List of 2
##     ...$ : NULL
##     ...$ : chr [1:20] "-0.7" "-0.6" "-0.5" "-0.4" ...
## $ : num [1:26371, 1:14] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "dimnames")=List of 2
##     ...$ : NULL
##     ...$ : chr [1:14] "-0.6" "-0.5" "-0.4" "-0.3" ...
## $ : num [1:26371, 1:16] 0 0 0 0 0 0 0 0 1 0 ...
##   ..- attr(*, "dimnames")=List of 2
##     ...$ : NULL
##     ...$ : chr [1:16] "-0.8" "-0.7" "-0.6" "-0.5" ...

```

```

##  $ : num [1:26371, 1:19] 0 0.571 0 0 0 ...
##  ..- attr(*, "dimnames")=List of 2
##  ... $ : NULL
##  ... $ : chr [1:19] "-0.7" "-0.6" "-0.5" "-0.4" ...

pdf("plot_AFpatterns.pdf", width=5, height=4)
for (i in 1:6){ #loop through climates
  enva <- as.numeric(colnames(mut_freq[[i]]))
  mutcor_enva <- abs(mut_cors_causal[,i])
  mutP_enva <- mut_Ps_causal[,i]
  mutsline <- as.numeric(mutP_enva<0.05) + 1
  mutslwd <- as.numeric(mutP_enva>0.05) + 1
  mutscol <- val2col(mutcor_enva, 1.0, breaks=seq(0,1,by=0.01))
  plot(c(min(enva), max(enva)), c(0,1), col="white", type="l", bty="l", ylab="", xlab="", xaxt = "n",
       main=colnames(indPhen_df[env_cols[i]]))

  for(j in 1:nrow(muts_causal)){ #loop through mutations
    whichrow <- which(muts_full$causal)[j]
    points(enva, mut_freq[[i]][whichrow,],
           col=mutscol[j], lwd=mutslwd[j], lty=mutsline[j], type="l")
  }
}
dev.off()

## pdf
## 2

```

Calculate RDA without nuisance environmental variables and without structure correction

```

rdaout <- rda(t(G_full_subset) ~ scale(subset_indPhen_df$env1_mat) +
               scale(subset_indPhen_df$env2_MTWetQ) +
               scale(subset_indPhen_df$env3_MTDQ) +
               scale(subset_indPhen_df$env4_PDM) +
               scale(subset_indPhen_df$env5_PwarmQ) +
               scale(subset_indPhen_df$env6_PWM)
)

```

Write data sampled and filtered from the simulations to the tutorial (optionally evaluated)

```

write.table(t(G_full_subset), "../tutorial/Genotypes2.txt", col.names =FALSE, row.names=FALSE)

head(subset_indPhen_df)
write.table(subset_indPhen_df[,-c(1,17,18)], "../../tutorial/Individuals2.txt", col.names =TRUE, row.names=FALSE)

head(muts_full)
write.table(muts_full[,c(4,5,6,8,17)], "../../tutorial/SNPs2.txt", col.names =TRUE, row.names=FALSE)

```

RDA Outputs

```
#str(rdaout)
scores <- scores(rdaout, choices=1:6)
scores

## $species
##          RDA1       RDA2       RDA3       RDA4
## 1-8      -9.573672e-03 -4.846651e-02  1.688204e-03  1.668423e-02
## 1-27     -1.684736e-02 -1.117227e-02 -4.181609e-02 -9.061324e-03
## 1-34     -6.587686e-03  1.473920e-02 -7.903150e-02 -9.554282e-03
## 1-81      8.154956e-02  3.693784e-02 -6.263948e-03  3.039403e-02
## 1-97      3.396345e-02 -9.319179e-03  6.423649e-03 -3.427415e-02
## 1-153     7.836793e-02  1.927015e-02 -8.299484e-03  3.836295e-02
## 1-154     -6.071557e-03 -1.951689e-02  2.519275e-02 -1.938889e-02
## 1-206     -8.431487e-03  1.723554e-02 -8.783225e-02 -9.662746e-03
## 1-287     -1.932803e-02 -4.415478e-02 -1.400912e-03  3.377991e-02
## 1-304     -1.606371e-02 -3.697456e-03  6.134560e-03 -5.656507e-03
## 1-346     -2.992324e-03 -6.410165e-02 -2.381476e-02 -9.212822e-03
## 1-364     -2.843159e-02 -2.513990e-02 -7.050057e-02 -2.020961e-02
## 1-368     -2.574312e-02 -4.330283e-03  1.337761e-02  1.076769e-03
## 1-389      7.122839e-02  1.534717e-02 -8.706470e-03  3.590087e-02
## 1-495     -5.009572e-01  6.527123e-02 -8.427378e-02  1.291251e-01
## 1-508      5.748613e-02  1.535086e-02 -7.094506e-03  4.183853e-02
## 1-525     -5.851245e-03 -2.172102e-02  2.776825e-02 -2.122716e-02
## 1-585     -1.182291e-01  1.935562e-01 -1.908419e-01 -2.003897e-02
## 1-689      1.754199e-02 -1.548059e-02 -3.089852e-03 -6.519632e-02
## 1-837     -1.309170e-02 -9.680927e-03 -5.166149e-02 -2.865286e-03
## 1-846      7.252422e-02  1.521649e-02 -9.687286e-03  4.016340e-02
## 1-869     -1.073277e-01 -9.911032e-02 -1.882723e-01 -2.077766e-02
## 1-921      1.908466e-02 -8.441897e-03  4.474440e-03 -8.818528e-02
## 1-933     -3.775210e-04 -2.281940e-02 -3.312544e-03 -1.834692e-03
## 1-1024    -1.675941e-02  7.001290e-03  3.702305e-03  1.368503e-02
## 1-1029    -2.722641e-02 -6.155809e-03  5.721674e-03 -2.463667e-02
## 1-1091    -1.712859e-02 -8.713044e-02  5.956531e-03  5.425262e-02
## 1-1113    -7.137127e-03 -2.531289e-02  3.079289e-02 -2.167200e-02
## 1-1155    -2.985482e-02 -1.619422e-02 -5.822728e-02 -3.945020e-03
## 1-1161    -1.712859e-02 -8.713044e-02  5.956531e-03  5.425262e-02
## 1-1224    -2.722641e-02 -6.155809e-03  5.721674e-03 -2.463667e-02
## 1-1259    -5.120608e-03 -9.916956e-03  1.765573e-02  4.518898e-03
## 1-1301    -3.511893e-02 -1.338272e-03 -7.126546e-03  2.181189e-02
## 1-1317    -3.775210e-04 -2.281940e-02 -3.312544e-03 -1.834692e-03
## 1-1349     5.866869e-02  3.981476e-02 -1.123190e-03 -7.834804e-02
## 1-1357     4.276415e-02  9.125693e-03  7.275502e-03 -4.797839e-02
## 1-1388    -2.406090e-02  1.595415e-02  4.875456e-02  2.931818e-02
## 1-1444    -4.607500e-03  2.517266e-02  1.095703e-02 -1.505990e-02
## 1-1494    -9.388687e-03 -1.366963e-02  9.032361e-03 -2.797781e-04
## 1-1499     1.571208e-01  2.791793e-02 -2.259494e-02  7.774688e-02
## 1-1538    -2.002619e-02 -7.872503e-03  1.118014e-02 -4.921513e-03
## 1-1566    -9.449896e-03  1.736051e-02  3.420971e-02 -2.961309e-03
## 1-1600     2.837994e-03  1.257107e-02  5.053075e-03 -1.394714e-02
## 1-1635    -8.442653e-03  2.495356e-02  2.521848e-02 -1.867120e-03
## 1-1650     1.365962e-01  2.268607e-02 -2.130717e-02  6.951824e-02
```

```

## 1-1685      -1.717523e-02  6.769439e-03  5.469643e-03  1.371323e-02
## 1-1731      1.417431e-01  2.352057e-02  -2.243897e-02  7.189396e-02
## 1-1793      -2.177993e-02  -4.467102e-02  -1.102699e-02  1.584451e-02
## 1-1820      -2.394985e-02  5.079904e-02  -4.833208e-02  -1.292642e-02
## 1-1823      -1.717523e-02  6.769439e-03  5.469643e-03  1.371323e-02
## 1-1851      -2.803699e-02  6.457327e-02  3.073387e-02  1.244376e-02
## 1-1863      -1.966145e-02  4.426308e-02  2.594990e-02  -8.884576e-05
## 1-1903      -1.151987e-02  -1.567515e-02  1.856240e-02  -5.527428e-03
## 1-1928      -6.756801e-04  -2.751660e-02  4.931175e-02  -1.589088e-02
## 1-1928_2    -2.002619e-02  -7.872503e-03  1.118014e-02  -4.921513e-03
## 1-1936      1.395971e-01  2.299521e-02  -2.203508e-02  7.088916e-02
## 1-1955      2.312382e-02  9.095296e-03  4.857952e-03  -4.400533e-02
## 1-1983      6.474396e-03  -1.910226e-02  -5.897548e-02  -2.546161e-03
## 1-1995      -2.847407e-02  -2.494816e-02  -7.037368e-02  -2.042510e-02
## 1-2035      -1.650289e-02  5.717069e-03  2.029217e-02  1.066534e-02
## 1-2061      -9.413979e-03  2.616965e-02  3.034588e-02  -1.710298e-03
## 1-2085      2.593395e-02  -5.740350e-03  5.489773e-03  -2.406645e-02
## 1-2102      -1.153285e-02  -1.260917e-02  1.211466e-02  4.019441e-03
## 1-2115      -1.715329e-02  4.247607e-02  -3.316213e-02  -6.593447e-03
## 1-2131      -5.759555e-03  2.893600e-03  2.097856e-02  9.861136e-03
## 1-2191      -8.382734e-03  5.275730e-03  2.133942e-02  5.775818e-03
## 1-2228      -2.734327e-02  -2.510274e-02  -6.841690e-02  -2.028489e-02
## 1-2272      -1.730570e-02  -1.330530e-02  -4.497587e-02  -1.034612e-02
## 1-2293      2.268744e-03  1.216027e-02  5.235022e-03  -1.299627e-02
## 1-2315      3.566471e-02  5.691323e-03  -1.571080e-04  -2.651145e-03
## 1-2374      -2.734327e-02  -2.510274e-02  -6.841690e-02  -2.028489e-02
## 1-2402      -9.237214e-03  7.952813e-03  -8.940154e-03  4.975143e-03
## 1-2443      -7.857751e-03  4.727201e-03  1.834986e-02  5.660774e-03
## 1-2494      -9.134265e-03  2.426052e-02  2.805597e-02  -1.299739e-03
## 1-2524      -2.088811e-02  -4.876219e-03  5.827785e-03  -1.099443e-03
## 1-2573      5.740804e-01  9.942716e-02  -2.857382e-02  -1.074172e-01
## 1-2594      -9.882601e-03  -6.685992e-02  5.144945e-03  -2.626715e-03
## 1-2628      -6.491174e-02  -1.177507e-01  4.941008e-02  1.055450e-01
## 1-2664      -2.546715e-02  -2.596495e-02  3.838150e-02  6.611986e-03
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## 1-3447      -6.869576e-03  -3.503277e-03  -3.771359e-02  -3.794685e-03
## 1-3588      1.182285e-02  -9.167396e-03  -1.867559e-03  -4.318379e-02
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## 1-3883	-2.053130e-03	-3.629076e-02	-7.562336e-03	-2.634649e-03
## 1-3885	-2.836895e-02	4.155847e-02	4.430956e-02	1.281716e-02
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## 1-4796	-2.238901e-03	-1.010764e-02	2.661652e-02	1.342111e-03
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## 1-5074	-2.026194e-02	-1.564301e-02	-4.737307e-02	-7.101649e-03
## 1-5087	5.433645e-02	2.096540e-02	3.302541e-03	-3.012190e-02
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## 1-5158	-1.844589e-02	-4.313900e-02	-7.203848e-04	3.313302e-02
## 1-5232	-1.292644e-02	1.751135e-02	3.865800e-02	9.761971e-03
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## 1-5843      -1.037535e-02  2.708442e-02 -1.960647e-02 -8.483737e-03
## 1-5861      3.183050e-02  1.710471e-02 -6.521297e-03  3.179816e-02
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## 1-5896      -1.855330e-02 -1.153556e-02  4.115223e-02  1.482366e-02
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## 1-6071      -6.093465e-03  1.225631e-02  1.921184e-02  2.663251e-04
## 1-6116      -1.116904e-02 -8.349891e-03  2.202166e-02 -3.962259e-02
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## 1-7237      -6.980434e-03 -1.636460e-02  2.886641e-02 -6.602952e-03
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## 1-10175	1.224555e-03	2.574395e-02	1.269174e-02	-1.925621e-02
## 1-10181	-9.653185e-03	-1.675386e-02	1.705356e-02	3.078869e-04
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## 1-10313	-1.486975e-02	7.328935e-03	4.663434e-03	1.338119e-02
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## 1-10535	7.532430e-03	-1.275659e-02	-4.820162e-03	-7.207038e-02
## 1-10541	2.488028e-02	1.610197e-03	2.898754e-03	-1.820523e-02
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## 1-10738	7.532430e-03	-1.275659e-02	-4.820162e-03	-7.207038e-02
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## 1-18269 -1.693808e-02 -4.480802e-03 7.907089e-03 -1.336346e-02
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## 1-18428 -1.405267e-02 3.228665e-02 -5.862520e-02 -6.172735e-03
## 1-18438 -1.850852e-02 -7.470875e-03 -5.343997e-02 -7.445670e-03
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## 1-18774 -4.990301e-03 -2.951515e-02 2.905721e-02 -7.935069e-03
## 1-18813 -1.115729e-02 -1.741757e-02 2.490895e-02 -1.258944e-03
## 1-18827 -1.433144e-02 3.468704e-02 5.032119e-02 -3.244221e-04
## 1-18862 -1.115602e-02 -1.741079e-03 1.368639e-02 7.632574e-03
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## 1-18943 -1.115729e-02 -1.741757e-02 2.490895e-02 -1.258944e-03
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## 1-19057 -1.661696e-02 -5.738987e-03 2.494993e-02 1.682220e-02
## 1-19062 1.049532e-01 2.299554e-02 -4.175145e-03 -2.022590e-02
## 1-19081 -2.038705e-02 -1.617695e-02 -5.198477e-02 -1.440166e-02
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## 1-19135 -1.429871e-02 -1.536118e-03 2.461629e-02 1.624710e-02
## 1-19143 -8.519088e-03 -3.967580e-03 -3.789121e-02 -3.624137e-03
## 1-19179 3.986699e-02 9.206608e-04 -6.495403e-03 1.579170e-02
## 1-19213 -5.807474e-02 -4.294323e-03 -6.867036e-02 7.245747e-03
## 1-19243 1.088404e-02 -9.345169e-03 -4.085402e-03 -1.873992e-02
## 1-19251 -1.316535e-02 -1.354211e-02 2.043478e-02 3.912392e-04
## 1-19347 -1.199710e-02 -1.358151e-02 2.050671e-02 -4.292781e-04
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## 1-19590 -1.797153e-02 1.233069e-02 1.297560e-02 1.387484e-02
## 1-19617 -1.557106e-02 -2.709978e-02 -8.811321e-03 1.255742e-02
## 1-19702 -3.303570e-02 -7.826364e-03 2.928645e-02 2.918335e-02
## 1-19704 -8.760202e-03 -2.880870e-02 2.565954e-02 -1.035456e-02
## 1-19704_2 -3.746951e-03 1.086350e-02 -4.737291e-02 -3.564510e-03
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## 1-19985 -3.811310e-03 -2.646011e-02 2.619795e-02 -7.634827e-03
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## 1-20241 -6.190501e-03 1.049475e-02 2.118045e-02 7.648524e-03
## 1-20260 3.236031e-02 7.821196e-03 -1.117628e-03 1.049349e-02
## 1-20282 -2.565509e-02 6.171205e-02 -1.479897e-02 -1.691731e-03
## 1-20300 -2.771201e-02 2.546903e-03 1.136066e-02 1.832875e-02
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## 1-20872      -2.890031e-03 -3.440259e-02 -7.000152e-03 -3.039675e-03
## 1-20911      -3.983799e-02 -7.858320e-03 -9.757349e-02 -1.083504e-02
## 1-21038      -2.558336e-02  4.598975e-02  8.297552e-02  4.093337e-03
## 1-21041      -1.865848e-02  3.551683e-03  1.418812e-02  1.306254e-02
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## 1-21102      -2.152295e-02  2.585774e-03  4.684208e-03  1.561589e-02
## 1-21117      -1.470279e-02  1.061285e-02 -4.028327e-02 -5.021341e-03
## 1-21144      -1.822273e-02  4.328405e-02  2.389406e-02 -4.059446e-03
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## 1-21217      -1.519365e-02  3.852847e-02 -2.644298e-02 -6.578254e-03
## 1-21266      -1.884705e-02  7.757510e-02  7.546716e-02 -2.382425e-02
## 1-21437      2.741858e-02 -5.687834e-03 -1.774575e-03 -9.577476e-02
## 1-21492      -3.509045e-02 -3.091015e-02  2.795306e-02  1.055833e-02
## 1-21551      -1.726181e-02 -2.846753e-02 -9.999288e-03  1.264814e-02
## 1-21585      -2.375650e-02  2.725025e-03 -3.534454e-02  6.949495e-04
## 1-21624      2.741858e-02 -5.687834e-03 -1.774575e-03 -9.577476e-02
## 1-21645      -5.310010e-03  5.494071e-03  2.269507e-02  9.508325e-03
## 1-21715      -1.779638e-02  4.242863e-02 -5.408477e-02 -1.211652e-02
## 1-21808      4.865511e-02  5.120651e-03 -6.359962e-03  2.081103e-02
## 1-21867      -1.036549e-02  1.324870e-02 -2.699412e-02 -4.636954e-03
## 1-21901      -1.969235e-02  2.193134e-02 -4.648003e-02 -7.636515e-03
## 1-21993      -5.115915e-01 -6.216656e-02  4.191655e-02 -1.740039e-02
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## 1-22012      2.661463e-02  1.140798e-02  6.063686e-03 -5.543741e-02
## 1-22015      -2.134626e-02 -3.417347e-02 -1.347369e-02  1.385947e-02
## 1-22022      -8.978996e-03 -2.520605e-02  2.732682e-02 -2.044077e-02
## 1-22118      -1.429298e-03 -4.770289e-03  1.074064e-03 -1.793460e-02
## 1-22145      -2.206299e-02  4.973554e-02 -1.184651e-01 -1.401642e-02
## 1-22208      4.709803e-02  6.592508e-03 -3.123774e-03  1.942390e-02
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## 1-22317      -6.133782e-02 -4.280227e-02  3.842891e-02  7.314271e-03
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## 1-22434      3.562928e-02  9.185271e-03 -1.273481e-03  1.320147e-02
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## 1-22493      -3.030202e-02  6.963082e-02  3.193745e-02  1.200472e-02
## 1-22494      1.832137e-02  4.490796e-04 -6.867978e-04 -7.493548e-02
## 1-22696      -4.715689e-02 -3.601252e-02  3.263834e-02  1.446407e-02
## 1-22760      -1.088209e-02  2.321060e-02 -5.785830e-02 -8.900765e-03
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## 1-22902      -3.611752e-02 -4.156755e-02  4.706558e-02 -2.160494e-02
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## 1-23285 -3.506659e-02 -7.340214e-03 3.093396e-02 3.231822e-02
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## 1-23551 -1.131466e-02 -3.009657e-02 3.245491e-02 -2.195441e-02
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## 1-23848 -4.036940e-03 -3.289890e-02 -7.460577e-03 5.887560e-05
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## 1-23884 2.717355e-02 5.449856e-03 -2.661832e-03 -8.207591e-03
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## 1-24967 -8.037122e-03 -9.266599e-02 1.474568e-02 4.975940e-02
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## 1-33092	-2.419219e-02	1.265447e-02	1.114686e-02	2.082728e-02
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## 1-33245 -6.823124e-03 -8.719429e-02 1.227011e-02 4.692318e-02
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## 1-33337 -2.324875e-02 -3.649538e-02 8.547317e-02 -8.026096e-03
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## 1-35132	-1.639515e-02	-6.972556e-03	2.434249e-03	-6.753168e-03
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## 1-35996	-1.037745e-02	-3.260937e-02	-2.756622e-02	-4.262982e-03
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## 1-36131	-1.583022e-02	-5.382682e-03	2.323044e-03	6.730973e-03
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## 2-55978	-5.927448e-03	-6.086427e-02	2.278223e-03	3.300458e-02
## 2-55990	2.059074e-02	1.578202e-03	1.938113e-03	-5.245228e-02
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## 2-56090	-7.334183e-03	1.944018e-02	3.313481e-02	-4.862587e-03
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## 2-56247	-1.310350e-02	-5.257025e-02	1.479995e-03	2.122891e-02
## 2-56253	-7.181277e-03	1.902265e-02	3.331272e-02	-4.999309e-03
## 2-56256	-2.375834e-02	-9.501397e-03	-6.782954e-02	-9.318133e-03
## 2-56407	-3.264299e-02	7.901265e-02	3.757578e-02	8.066694e-03
## 2-56551	-4.883508e-02	-1.864772e-01	7.171267e-04	9.498574e-02

## 2-56616	3.043940e-02	-2.184312e-02	6.107103e-03	-2.729086e-02
## 2-56631	-3.730585e-03	1.448981e-03	1.833864e-02	5.329530e-03
## 2-56632	-1.448000e-02	-1.341756e-02	1.369628e-02	1.065189e-02
## 2-56649	-1.116120e-02	2.649681e-02	-1.902822e-02	-6.704150e-03
## 2-56669	-2.063451e-02	-1.312160e-02	1.202516e-02	1.407193e-02
## 2-56684	-9.841636e-03	2.319958e-02	-1.953109e-02	-3.910229e-03
## 2-56715	3.095351e-02	1.322696e-02	1.195468e-03	-4.242081e-02
## 2-56752	-2.760414e-02	-1.491840e-01	5.966706e-03	5.770708e-02
## 2-56774	1.267216e-03	-1.188378e-02	-5.792408e-02	-2.291172e-03
## 2-56825	-9.547746e-03	-2.249528e-02	2.561308e-02	-1.239974e-02
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## 2-56937	-1.986094e-02	-1.283462e-02	2.765399e-02	-3.409626e-02
## 2-56940	-8.441600e-03	-1.694087e-02	2.023212e-02	-1.065547e-02
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## 2-56988	1.983684e-02	1.271686e-02	-8.827594e-03	8.058695e-03
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## 2-57067	-1.818377e-02	2.780294e-02	4.831451e-02	9.225180e-03
## 2-57070	-3.730585e-03	1.448981e-03	1.833864e-02	5.329530e-03
## 2-57096	3.362984e-02	1.448914e-02	1.672648e-03	-5.247551e-02
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## 2-58867	-2.540471e-02	5.959543e-02	2.619488e-02	8.883214e-03
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## 2-58929	3.881591e-02	8.632804e-03	-2.826454e-03	1.203080e-02
## 2-58931	-2.300492e-02	-7.571833e-03	-4.960577e-02	-4.766373e-03

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## 2-63403	1.248667e-02	2.148071e-02	-6.681622e-03	-2.917563e-02
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## 2-63416	-3.286246e-02	8.157439e-02	2.560381e-02	3.770990e-03
## 2-63462	-2.039078e-02	-4.794660e-03	7.475747e-03	-1.070120e-02
## 2-63476	-1.035061e-02	-4.137062e-03	6.923390e-03	7.790232e-03
## 2-63534	-1.941874e-02	1.084112e-02	6.034766e-03	1.647211e-02
## 2-63606	-1.871487e-02	8.900899e-04	3.245111e-03	-9.479078e-03
## 2-63668	2.850941e-02	1.358567e-02	6.380959e-03	-6.578611e-02
## 2-63672	1.967950e-02	2.917482e-02	-7.004170e-03	-4.372250e-02
## 2-63735	-1.644533e-02	8.066305e-04	3.621456e-03	-1.123424e-02
## 2-63836	-7.099035e-03	-2.930585e-02	-6.315910e-04	8.679184e-03
## 2-63915	-8.112897e-03	9.001657e-03	2.333727e-02	4.342366e-03
## 2-63943	-3.249187e-03	-4.196874e-02	1.574408e-03	-2.728656e-03
## 2-64002	1.254683e-02	-1.542130e-02	6.980454e-04	-3.419120e-02
## 2-64033	2.044372e-01	-3.387351e-01	-9.950150e-02	1.260407e-02
## 2-64048	-3.257990e-03	-3.999828e-02	1.400757e-03	-2.731346e-03
## 2-64065	-6.271269e-03	-2.748879e-02	3.012903e-02	9.331938e-04
## 2-64093	-3.036959e-02	-2.302350e-02	-7.554438e-02	-1.923339e-02
## 2-64097	1.772797e-01	-2.270018e-01	-1.217512e-01	6.854289e-02
## 2-64102	-8.789418e-03	1.069940e-02	2.548177e-02	4.302448e-03
## 2-64113	3.736967e-02	1.561615e-02	7.585664e-03	-7.389070e-02
## 2-64136	-5.873743e-03	-4.401456e-03	1.598969e-02	7.602695e-03
## 2-64243	-1.691700e-02	-7.810990e-03	-3.616688e-02	-1.644361e-03
## 2-64268	-2.429495e-02	8.887561e-03	4.771035e-02	3.198556e-02
## 2-64474	1.460054e-01	3.477609e-02	-1.922672e-02	9.045116e-02
## 2-64480	-6.756141e-03	-2.368327e-02	2.824034e-02	-1.148556e-02
## 2-64495	-8.228071e-03	-8.771767e-04	-2.344877e-02	4.861037e-04
## 2-64654	1.250584e-02	-8.978004e-03	-2.094008e-02	2.331234e-03
## 2-64659	3.964494e-02	-1.823418e-02	-1.315557e-02	-7.667209e-02
## 2-64676	-2.834882e-02	-1.125930e-02	-7.907094e-02	-1.192383e-02
## 2-64706	1.069958e-01	3.111087e-02	-1.096174e-02	4.914704e-02
## 2-64712	-1.113295e-02	2.869707e-02	-2.115836e-02	-8.978283e-03
## 2-64769	-2.860788e-02	6.623549e-02	3.018993e-02	1.152239e-02
## 2-64868	-2.415677e-02	-8.117625e-03	1.883842e-02	2.595113e-02
## 2-64996	-2.021881e-02	5.179586e-02	-4.608235e-02	-9.739354e-03
## 2-65038	3.952497e-02	8.159690e-03	-2.942827e-03	7.875718e-03
## 2-65165	-1.435017e-02	3.208975e-02	-5.287626e-02	-6.148489e-03
## 2-65196	1.777385e-02	1.002766e-02	3.827137e-03	-4.807692e-02
## 2-65389	-2.481034e-03	-2.175798e-02	2.747117e-02	-5.113709e-03
## 2-65419	-1.368812e-01	-8.624179e-02	1.558886e-01	1.662462e-02
## 2-65554	-8.972611e-03	-1.047440e-01	1.614712e-02	5.642028e-02
## 2-65595	-1.140006e-02	-4.071667e-03	2.204163e-02	1.282111e-02
## 2-65655	-1.155657e-02	-3.261664e-02	-4.059582e-03	1.027600e-02

## 2-65669	9.224281e-02	2.560644e-02	-1.318025e-02	5.965175e-02
## 2-65759	6.521331e-02	1.793105e-02	-5.484652e-03	3.644476e-02
## 2-65820	4.696295e-03	-1.804585e-02	-4.571853e-02	-1.642091e-03
## 2-65822	-3.415355e-02	-2.230937e-02	-8.245049e-02	-1.791212e-02
## 2-65830	1.461854e-02	-1.614271e-02	1.626276e-03	-3.419737e-02
## 2-65843	4.353852e-03	-4.511594e-02	2.539932e-02	-3.187652e-02
## 2-65851	-5.689704e-03	-3.044749e-02	-1.580747e-03	2.785374e-03
## 2-65891	-5.106154e-02	-4.302203e-02	5.877218e-02	-6.315134e-03
## 2-65903	6.288986e-02	-1.738512e-02	1.266635e-02	-1.498518e-01
## 2-65924	6.989178e-02	1.872113e-02	-5.848329e-03	3.846110e-02
## 2-65941	1.272690e-02	-1.820576e-02	-1.636375e-02	-1.514164e-02
## 2-66043	1.461854e-02	-1.614271e-02	1.626276e-03	-3.419737e-02
## 2-66051	-1.186052e-02	1.856527e-02	3.894437e-02	1.408850e-02
## 2-66080	-8.584096e-03	2.622601e-02	4.226371e-02	-7.321940e-03
## 2-66220	2.343722e-01	3.590745e-02	-3.062574e-02	1.076830e-01
## 2-66240	-3.582981e-03	-1.831889e-03	2.035756e-02	5.665679e-03
## 2-66365	6.297724e-03	1.409444e-02	-1.844948e-03	-2.262400e-02
## 2-66382	2.199571e-02	-5.435384e-03	-8.293422e-04	-7.939947e-03
## 2-66461	2.099756e-01	2.282525e-02	-2.622120e-02	8.234915e-02
## 2-66506	3.809234e-02	8.478322e-03	-2.552791e-03	7.424799e-03
## 2-66605	3.809234e-02	8.478322e-03	-2.552791e-03	7.424799e-03
## 2-66610	-2.689553e-02	6.374821e-02	4.069616e-02	-1.089052e-03
## 2-66656	-1.853908e-02	-7.634723e-03	-5.359346e-02	-8.319602e-03
## 2-66669	1.461854e-02	-1.614271e-02	1.626276e-03	-3.419737e-02
## 2-66675	-6.728465e-03	-4.565081e-02	-4.470349e-03	4.356859e-04
## 2-66693	9.173814e-03	1.076346e-02	2.982721e-03	-1.618817e-02
## 2-66816	-1.417139e-02	2.883354e-02	-4.496315e-02	-6.324032e-03
## 2-66870	-2.689553e-02	6.374821e-02	4.069616e-02	-1.089052e-03
## 2-66914	-2.035242e-02	-1.567420e-02	1.509569e-02	6.481828e-03
## 2-66919	-5.221919e-03	-3.386832e-02	-5.856266e-03	-5.054506e-04
## 2-66979	6.892072e-02	2.925333e-02	-9.911220e-03	4.552490e-02
## 2-67048	-8.221529e-03	-6.313435e-03	1.402937e-02	-1.210461e-02
## 2-67078	-2.034610e-02	3.653383e-02	-8.040682e-02	-8.373828e-03
## 2-67143	-2.415677e-02	-8.117625e-03	1.883842e-02	2.595113e-02
## 2-67306	-2.415677e-02	-8.117625e-03	1.883842e-02	2.595113e-02
## 2-67319	1.120033e-01	-3.587385e-03	-2.479756e-02	2.983132e-02
## 2-67358	5.870284e-02	4.193143e-03	-8.813862e-03	2.573561e-02
## 2-67367	-1.257740e-02	-1.445963e-02	1.334722e-02	2.598581e-03
## 2-67399	2.670479e-02	6.209697e-03	-3.645687e-03	9.571797e-03
## 2-67431	-5.151288e-03	-3.478804e-02	6.136594e-04	5.476280e-04
## 2-67460	-1.940268e-02	4.927952e-02	5.979665e-02	-1.981634e-03
## 2-67496	-5.620454e-03	5.679644e-03	2.991332e-02	9.522306e-03
## 2-67500	-2.845600e-02	5.610739e-02	-9.175578e-02	-1.218165e-02
## 2-67544	-2.056134e-02	4.628156e-02	2.552766e-02	-1.020259e-03
## 2-67602	4.068449e-02	1.307155e-02	-4.287784e-03	2.623238e-02
## 2-67607	-1.726396e-02	2.712259e-02	-8.313696e-02	-7.592973e-03
## 2-67627	3.049539e-02	-8.024773e-03	4.304805e-03	-6.128905e-02
## 2-67630	-8.089111e-03	1.024194e-02	3.016020e-02	9.145110e-03
## 2-67661	-3.873185e-02	-2.206604e-02	-8.686239e-02	-1.946475e-02
## 2-67662	-7.679832e-03	9.901060e-03	2.857322e-02	8.862228e-03
## 2-67665	-1.548293e-02	-2.089847e-02	3.328097e-02	-3.846481e-02
## 2-67667	-1.245107e-02	-9.811637e-02	1.558601e-02	5.458387e-02
## 2-67795	-2.056134e-02	4.628156e-02	2.552766e-02	-1.020259e-03
## 2-67821	3.126463e-02	-5.247502e-03	1.141501e-05	-5.772819e-02

## 2-67824	-3.671424e-02	7.248437e-04	6.271040e-03	2.316967e-02
## 2-67857	-3.035682e-02	6.080836e-02	-1.207899e-01	-1.345755e-02
## 2-67956	-3.925710e-03	1.969177e-02	3.484028e-02	-1.187203e-02
## 2-67971	4.443156e-02	3.085140e-03	4.651428e-03	-2.362142e-02
## 2-68004	-2.236703e-02	-1.777353e-02	3.173105e-02	1.219240e-02
## 2-68034	-5.262679e-03	8.822584e-03	2.315063e-02	1.060772e-02
## 2-68062	-2.056134e-02	4.628156e-02	2.552766e-02	-1.020259e-03
## 2-68076	2.051423e-02	1.765834e-02	-2.893145e-02	3.418956e-02
## 2-68089	-2.164730e-02	-2.255091e-03	2.037021e-02	3.750109e-03
## 2-68099	7.819775e-02	3.831960e-02	-1.310348e-02	7.627042e-02
## 2-68109	-1.245107e-02	-9.811637e-02	1.558601e-02	5.458387e-02
## 2-68136	-1.078379e-02	-1.867748e-03	1.553749e-02	8.972636e-03
## 2-68143	-9.808559e-03	3.079846e-02	3.384396e-02	-2.659959e-03
## 2-68180	-2.803699e-02	6.457327e-02	3.073387e-02	1.244376e-02
## 2-68181	-6.426203e-03	9.845106e-06	4.606302e-04	-1.008047e-02
## 2-68266	6.333955e-03	-1.794938e-02	-3.721794e-02	-1.985060e-03
## 2-68271	-2.803699e-02	6.457327e-02	3.073387e-02	1.244376e-02
## 2-68276	-6.598886e-04	1.497045e-03	-4.387395e-02	-6.692530e-03
## 2-68303	-2.202120e-02	6.613400e-03	-3.074762e-02	6.172658e-03
## 2-68312	-3.305861e-03	-3.962179e-02	-5.759062e-03	-2.110872e-03
## 2-68317	3.774490e-02	9.849061e-03	-2.770173e-03	2.246410e-02
## 2-68348	1.330643e-02	-1.689012e-02	1.444630e-03	-3.808722e-02
## 2-68375	2.984022e-02	-5.797567e-03	-2.263637e-03	-4.896254e-02
## 2-68389	1.701111e-02	2.937724e-02	-3.492926e-03	-4.226145e-02
## 2-68413	-2.803699e-02	6.457327e-02	3.073387e-02	1.244376e-02
## 2-68431	-2.056134e-02	4.628156e-02	2.552766e-02	-1.020259e-03
## 2-68453	-6.894802e-03	2.419409e-02	2.273872e-02	-1.919704e-03
## 2-68566	6.194034e-02	1.194920e-02	-8.226011e-03	3.094727e-02
## 2-68686	-9.288399e-03	4.706125e-03	-2.798036e-02	-3.448393e-03
## 2-68711	-1.687323e-02	-5.986054e-03	-4.777766e-02	-6.987731e-03
## 2-68727	-2.803699e-02	6.457327e-02	3.073387e-02	1.244376e-02
## 2-68830	-1.418906e-01	-4.676901e-02	1.267804e-01	3.215101e-02
## 2-68873	-2.803699e-02	6.457327e-02	3.073387e-02	1.244376e-02
## 2-68889	-5.969413e-03	-9.910062e-03	2.009599e-02	6.757998e-03
## 2-68925	-2.803699e-02	6.457327e-02	3.073387e-02	1.244376e-02
## 2-68939	8.546313e-02	4.119647e-02	1.919251e-01	2.975189e-02
## 2-68977	-8.285381e-03	-2.612709e-02	2.759195e-02	-3.666474e-03
## 2-68978	-5.413637e-03	-2.667852e-02	-1.779194e-03	1.709899e-03
## 2-69003	-8.421373e-03	8.603847e-03	2.875344e-02	1.295196e-02
## 2-69049	-8.191411e-03	-2.400163e-02	2.534658e-02	-2.396013e-03
## 2-69077	-4.321919e-02	9.922064e-02	-6.551803e-02	-1.823509e-02
## 2-69083	3.067666e-02	-8.085525e-03	-2.026705e-03	-4.582499e-02
## 2-69084	5.145771e-02	1.411776e-02	-5.539048e-03	3.114880e-02
## 2-69089	-4.586664e-02	2.791458e-04	6.684554e-03	2.643401e-02
## 2-69128	-1.390778e-02	2.457583e-02	4.270613e-02	1.101414e-04
## 2-69157	9.552659e-03	2.357825e-02	-5.089343e-03	-2.922488e-02
## 2-69238	-2.056134e-02	4.628156e-02	2.552766e-02	-1.020259e-03
## 2-69256	8.088287e-02	1.517582e-02	-1.047051e-02	4.065029e-02
## 2-69270	-2.473816e-02	5.724572e-02	-4.712276e-02	-1.258582e-02
## 2-69278	-2.056134e-02	4.628156e-02	2.552766e-02	-1.020259e-03
## 2-69318	-2.803699e-02	6.457327e-02	3.073387e-02	1.244376e-02
## 2-69388	-1.078775e-02	-2.309743e-02	3.930288e-02	-2.220987e-02
## 2-69419	-2.203137e-02	1.480142e-02	-2.589659e-02	4.323642e-03
## 2-69464	1.605114e-02	1.101125e-02	2.097700e-03	-4.824947e-02

## 2-69597	-2.803699e-02	6.457327e-02	3.073387e-02	1.244376e-02
## 2-69605	3.922105e-02	2.170873e-02	7.768597e-03	-9.767114e-02
## 2-69679	-9.521889e-03	-8.059483e-03	8.122191e-03	-6.402967e-03
## 2-69744	1.010874e-01	1.702140e-02	-1.330385e-02	5.053158e-02
## 2-69762	-2.150416e-02	1.677059e-02	-4.388722e-02	-4.887837e-03
## 2-69795	-1.087349e-02	2.082809e-02	3.095306e-02	1.278415e-03
## 2-69943	-1.515103e-02	3.717673e-02	-1.912926e-02	-7.197117e-03
## 2-70000	-1.471401e-02	-1.356094e-02	-4.054751e-02	-1.559080e-02
## 2-70007	-8.813341e-03	-8.193962e-03	1.815812e-02	-1.570951e-02
## 2-70056	1.958941e-02	-3.332575e-03	6.227413e-03	-1.153176e-02
## 2-70057	4.378827e-03	-6.431003e-03	-3.525835e-02	-2.670201e-03
## 2-70065	-2.834882e-02	-1.125930e-02	-7.907094e-02	-1.192383e-02
## 2-70173	3.209143e-01	4.030304e-01	2.526459e-02	-7.865355e-02
## 2-70177	-1.005278e-02	9.344522e-03	2.994061e-02	1.606348e-02
## 2-70191	-1.264330e-02	1.902394e-02	3.960637e-02	3.740257e-03
## 2-70194	1.933433e-01	6.521544e-02	-2.349302e-02	1.329787e-01
## 2-70199	9.963567e-03	2.437030e-02	-4.610793e-03	-3.683554e-02
## 2-70284	-1.556129e-02	-1.029840e-03	2.187957e-03	-1.790273e-03
## 2-70328	-1.080504e-02	1.143375e-02	-1.852973e-02	4.380498e-03
## 2-70387	-1.480921e-02	-3.727530e-02	3.595677e-02	-6.240372e-03
## 2-70394	2.890484e-01	3.699658e-01	4.823630e-02	-7.381115e-02
## 2-70446	3.283159e-02	2.861788e-02	-2.965242e-03	-3.429023e-02
## 2-70476	-2.458437e-01	3.145143e-01	3.921098e-02	1.721631e-02
## 2-70487	-2.051443e-02	-1.040788e-02	2.497447e-02	-2.469863e-02
## 2-70508	6.737347e-02	9.381853e-03	2.332887e-03	-1.057043e-02
## 2-70516	4.115202e-02	2.509719e-02	9.196469e-03	-1.037206e-01
## 2-70541	-8.604792e-03	1.618870e-03	-2.959530e-02	-3.994134e-03
## 2-70578	-1.077304e-02	2.556416e-02	-2.148882e-02	-5.141186e-03
## 2-70697	-2.803699e-02	6.457327e-02	3.073387e-02	1.244376e-02
## 2-70742	-2.091577e-02	-1.063196e-02	2.525117e-02	-2.448217e-02
## 2-70751	-1.838614e-02	-2.047700e-02	-1.591004e-02	1.218632e-02
## 2-70790	-7.345279e-03	1.192822e-02	1.505132e-02	-8.707360e-04
## 2-70797	-2.053523e-02	-2.621807e-02	-1.735617e-02	1.374364e-02
## 2-70818	7.670811e-03	3.147960e-02	5.766708e-03	-3.016817e-03
## 2-70827	-3.093842e-02	-1.914700e-02	1.748240e-02	-7.458098e-03
## 2-70853	2.379124e-02	-4.806562e-03	-1.177364e-03	-4.791413e-02
## 2-70878	-3.600854e-02	8.087133e-02	-1.294824e-01	-1.299124e-02
## 2-70954	-7.982467e-03	-2.978428e-02	-3.792948e-03	4.888772e-03
## 2-71073	-2.199024e-02	-8.971969e-03	-4.576013e-02	-5.108568e-03
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## 2-71450	1.448393e-02	3.524313e-03	1.839443e-03	-3.385129e-02
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## 2-77894	-3.514327e-03	-8.143730e-02	1.259930e-02	4.047959e-02
## 2-77901	5.233453e-03	1.339453e-03	9.920810e-03	-2.653348e-02
## 2-77929	-5.119322e-02	-1.094119e-02	9.348355e-04	1.874721e-02
## 2-78120	1.078361e-03	-7.812643e-03	-7.080292e-02	-2.827062e-03
## 2-78123	-5.119322e-02	-1.094119e-02	9.348355e-04	1.874721e-02
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## 2-78443	-2.983839e-02	-2.736456e-03	2.690540e-02	2.087108e-02
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## 2-78599	-2.983839e-02	-2.736456e-03	2.690540e-02	2.087108e-02
## 2-78604	3.890921e-02	1.574259e-02	-5.415060e-03	3.161607e-02
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## 2-78660	-3.033986e-03	-8.000144e-02	1.227934e-02	3.972998e-02
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## 2-78685	-1.031145e-02	5.837268e-03	3.000722e-02	1.591869e-02
## 2-78717	-2.192862e-02	9.453249e-03	1.969303e-01	-6.968981e-02
## 2-78735	-1.952934e-03	-7.732378e-02	1.201752e-02	3.727422e-02
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## 2-79175	1.134445e-02	1.146497e-02	-1.018632e-03	-2.818519e-02
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## 2-84700	-1.820895e-02	-4.122246e-02	-1.215741e-02	1.309204e-02
## 2-84727	-1.790210e-02	-1.131489e-02	-3.149336e-02	-8.286341e-03
## 2-84737	-6.969534e-03	-2.599396e-02	-3.483726e-03	4.799602e-03
## 2-84788	3.008889e-02	-6.046821e-03	2.218720e-03	-3.461028e-02
## 2-84868	-7.160216e-03	-5.299930e-03	1.519196e-02	6.757272e-03
## 2-84931	-1.950785e-02	-2.508042e-03	4.018246e-03	1.304367e-02
## 2-84989	5.623769e-02	8.771938e-03	6.532203e-03	-3.105688e-02
## 2-85028	-1.929675e-02	2.608995e-02	2.231362e-02	8.738800e-03
## 2-85036	8.481464e-02	1.667858e-02	-1.684976e-02	4.599314e-02
## 2-85037	-5.308580e-03	-5.454585e-03	-4.024688e-02	-1.579763e-04
## 2-85138	-1.379390e-01	3.051113e-01	-7.531883e-02	5.961619e-02
## 2-85184	-4.474974e-02	4.150224e-02	5.393543e-02	3.415901e-02
## 2-85222	-1.684224e-02	3.712693e-02	1.424272e-02	8.707803e-03
## 2-85278	-4.205035e-02	6.053815e-02	-9.027559e-02	-1.735077e-02
## 2-85285	6.165647e-02	-3.397195e-03	-2.838131e-02	-3.270522e-02

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## 2-85305	2.165768e-02	1.013717e-02	1.234889e-02	-3.668023e-02
## 2-85332	-1.500626e-02	3.164353e-02	-3.862961e-02	-5.162337e-03
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## 2-87365	1.111346e-01	4.209381e-02	-1.583614e-02	7.532199e-02
## 2-87369	9.225886e-03	1.324824e-02	-5.201931e-03	-1.406660e-02
## 2-87382	-4.422105e-02	9.283972e-02	5.441291e-02	9.187809e-03
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## 2-87413	-6.751658e-03	-3.060706e-02	2.879073e-02	-7.507244e-03
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## 2-87540	7.483891e-02	-6.523775e-03	3.031491e-03	-9.431386e-02
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## 2-98927      -1.855293e-02  4.245388e-02  2.249537e-02 -1.040500e-03
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## 2-99142      -3.091766e-04 -2.619280e-02 -3.300303e-03 -4.912696e-03
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## 2-99266      -1.025184e-03 -2.745939e-02 -3.637565e-03 -4.282167e-03
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## 3-102760	-2.601821e-02	-1.020566e-02	-6.817695e-02	-9.945537e-03
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## 3-102924	-8.128932e-03	9.024231e-03	2.675295e-02	8.804395e-03
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## 3-107485	2.362052e-03	-2.105898e-02	-4.703816e-02	-2.429822e-03
## 3-107501	-2.080520e-04	-1.368126e-02	2.601261e-02	-1.487852e-02
## 3-107516	-5.687498e-03	1.009799e-02	1.844324e-02	3.032038e-03
## 3-107538	-1.242192e-02	3.794948e-02	-4.070160e-02	-7.528386e-03
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## 3-107573	-5.360077e-03	-1.871574e-02	3.315927e-02	1.774438e-03
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## 3-107668	-7.213825e-03	3.802384e-03	-2.009965e-02	3.211093e-04
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## 3-107762	-3.341466e-03	4.994281e-03	-4.110545e-02	-1.280948e-03
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## 3-107903	-3.067824e-02	-1.122195e-02	3.014903e-02	-1.299350e-02
## 3-107905	-3.543157e-02	-1.080797e-02	-9.105940e-02	-1.372525e-02
## 3-107933	5.182545e-02	-1.351016e-02	7.138892e-04	-6.073659e-02
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## 3-108036	-4.869013e-02	1.148154e-02	2.010515e-02	4.192522e-02
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## 3-108883	-5.192961e-03	-2.548007e-02	2.461975e-02	-1.034880e-02
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## 3-115224     -2.610790e-03  -7.516726e-03  1.807260e-02  3.273610e-03
## 3-115266     -2.510382e-03  3.684692e-03  2.019246e-02  4.578525e-03
## 3-115276     -1.332861e-02  -3.784737e-02 -9.951873e-04  1.986521e-02
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## 3-115306     -2.610790e-03  -7.516726e-03  1.807260e-02  3.273610e-03
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## 3-115948 -6.619580e-03 8.285981e-03 -3.384187e-02 -2.071205e-03
## 3-115957 -2.161231e-02 -3.391601e-02 -1.372972e-02 9.720427e-03
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## 3-117845 -2.870213e-02 -2.082362e-03 -5.459184e-02 -2.833335e-03
## 3-117874 -6.349028e-03 -2.305178e-02 2.305073e-02 -8.603460e-03
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## 3-118496 -1.590873e-02 -1.146306e-01 1.486998e-02 6.742287e-02
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## 3-118605 -3.462302e-03 1.363264e-03 1.606918e-02 7.082801e-03
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## 3-118691 -2.179884e-02 7.685571e-03 7.535069e-03 1.916190e-02
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## 3-120160_2 3.979048e-02 1.242995e-02 3.775719e-03 -3.830341e-02
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## 3-121384 2.862066e-03 -1.639375e-02 -6.849124e-05 -1.996852e-02
## 3-121411 -2.033237e-02 3.226490e-03 4.035368e-03 1.637262e-02
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## 3-121560	-1.032931e-02	-1.552372e-02	1.706196e-02	-6.125410e-04
## 3-121572	-1.032931e-02	-1.552372e-02	1.706196e-02	-6.125410e-04
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## 3-121656	6.142919e-02	1.531344e-02	-7.610089e-03	2.690740e-02
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## 3-122060	-6.371881e-03	1.928943e-02	3.468826e-02	-5.705376e-03
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## 3-122180	1.117148e-02	-8.824097e-03	-4.499249e-03	-2.925190e-02
## 3-122191	-5.189743e-03	1.743110e-02	2.946223e-02	-5.924420e-03
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## 3-122287	-5.189743e-03	1.743110e-02	2.946223e-02	-5.924420e-03
## 3-122288	-1.560004e-02	-2.094757e-02	3.037078e-02	-4.659876e-03
## 3-122292	-3.457114e-03	-4.852395e-02	6.880519e-03	1.114340e-02
## 3-122294	7.364056e-02	2.539360e-02	-1.194282e-02	4.288160e-02
## 3-122360	3.153859e-02	1.003322e-03	6.194531e-04	-6.252230e-03
## 3-122529	4.062534e-02	1.837429e-02	-1.902535e-03	-1.184786e-02
## 3-122576	-1.000605e-02	-9.164068e-02	1.319111e-02	4.780867e-02
## 3-122620	3.198688e-02	1.156438e-03	5.981820e-04	-8.040110e-03
## 3-122691	5.194546e-02	1.133422e-02	1.393392e-03	-1.616531e-02
## 3-122726	-1.988312e-02	-7.304642e-04	2.213527e-02	1.832173e-02
## 3-122794	-1.026867e-02	-1.952768e-02	2.141973e-02	-2.799643e-03
## 3-122833	-9.720370e-03	-9.701680e-02	1.447038e-02	4.925489e-02
## 3-122869	-2.084506e-02	1.852074e-02	-1.264626e-02	9.342248e-03
## 3-122908	-3.586887e-02	-8.249146e-03	-7.481297e-02	-9.209334e-03
## 3-122938	7.953674e-02	-1.378642e-02	-1.054799e-02	-3.055964e-02
## 3-122940	-2.084506e-02	1.852074e-02	-1.264626e-02	9.342248e-03
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## 3-122980	7.634765e-02	-1.231016e-02	-9.490688e-03	-2.935694e-02
## 3-123217	-8.264809e-03	4.147067e-03	-4.029454e-02	-1.001927e-03
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## 3-123290	1.432739e-02	-1.042883e-02	-2.937286e-03	-2.516221e-02
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## 3-123816	1.084556e-03	1.337345e-02	-2.229259e-02	-2.925458e-03
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## 3-123856	2.898385e-03	1.025409e-02	-1.825699e-02	-1.775458e-03
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## 3-123994 -2.004718e-02 1.751606e-02 -1.310648e-02 8.196686e-03
## 3-124005 -1.367752e-02 7.077658e-03 1.168796e-02 1.398066e-02
## 3-124033 -1.526195e-02 1.349298e-03 -1.117116e-03 1.012966e-02
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## 3-124281 -1.234463e-02 6.629460e-03 1.027788e-02 1.239826e-02
## 3-124292 -1.846309e-02 -1.213800e-01 1.696955e-02 6.936771e-02
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## 3-129908      8.770277e-02  2.669722e-02 -1.243603e-02  5.193002e-02
## 3-129956     -1.790483e-02 -4.888444e-02  5.665449e-02 -9.250548e-02
## 3-129981      2.141524e-03 -2.241104e-02  4.464229e-02 -1.837371e-02

```

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## 3-130069      5.770785e-04 -2.139181e-02  4.834884e-02 -1.895068e-02
## 3-130072     -5.641566e-03  1.299546e-02  2.762564e-02 -2.462962e-03
## 3-130099     -2.086494e-02  4.814634e-02 -3.088350e-02 -1.084235e-02
## 3-130100     -1.627663e-03 -2.462477e-02  1.832620e-03  3.595141e-05
## 3-130216     -3.863954e-03  1.086981e-02  2.488248e-02 -3.162330e-05
## 3-130245     -7.276418e-03 -4.449185e-02  4.987141e-02 -1.036105e-01
## 3-130276     -7.708198e-03 -2.975571e-03 -2.864115e-02 -1.526362e-03
## 3-130295     -1.274364e-02 -6.402552e-02  7.239562e-03  3.941181e-02
## 3-130348     -9.116976e-03 -2.233986e-02 -3.277161e-03  2.008257e-03
## 3-130444      2.098828e-02  7.322353e-04 -2.086743e-02 -1.359400e-02
## 3-130456     -7.670680e-03 -7.435950e-02  1.125339e-02  4.101188e-02
## 3-130541     -1.820629e-02 -7.066909e-03  2.572391e-02  1.705415e-02
## 3-130590      3.731214e-02  3.305651e-03 -5.700232e-03  1.539022e-02
## 3-130629      8.669352e-03  1.375216e-02 -4.053847e-03 -1.746152e-02
## 3-130644     -3.013500e-03  1.016248e-02 -2.401627e-02 -1.808340e-03
## 3-130661     -3.459425e-02 -1.162297e-02 -7.453874e-02 -1.115842e-02
## 3-130672      5.197687e-02  6.688432e-03 -8.224174e-03  2.533690e-02
## 3-130687     -1.751443e-02 -1.000945e-02  3.025354e-02  1.650664e-02
## 3-130733     -9.225470e-02 -3.881161e-02 -1.929158e-01 -2.891215e-02
## 3-130780      3.206404e-02 -4.298379e-03  1.366134e-03 -2.771587e-02
## 3-130794     -1.805324e-02 -4.648905e-02 -7.731856e-03  1.271184e-02
## 3-130797     -2.565280e-02 -4.455092e-03 -6.881457e-04  1.246998e-02
## 3-130877     -3.555874e-02 -1.174698e-02 -7.664424e-02 -1.097284e-02
## 3-130896     -3.683614e-02  8.465363e-02  4.649844e-02  9.325403e-03
## 3-130898     -3.555874e-02 -1.174698e-02 -7.664424e-02 -1.097284e-02
## 3-130996      1.460127e-01  2.379221e-02 -1.269607e-02  4.531523e-02
## 3-131031     -2.945659e-02 -9.978995e-03 -7.940884e-02 -1.201473e-02
## 3-131084     -3.241769e-02 -1.082438e-02 -7.213039e-02 -1.290010e-02
## 3-131107     -3.548851e-02  5.919201e-02 -1.473061e-01 -1.802479e-02
## 3-131114      3.997473e-04 -1.448206e-02  3.397937e-02 -1.560196e-02
## 3-131201     -1.872294e-02  3.783125e-02 -3.593622e-02 -6.764738e-03
## 3-131227      4.923915e-02 -4.879257e-03 -2.939615e-03 -1.598745e-02
## 3-131459     -9.615105e-03  2.983314e-02 -7.100153e-02 -7.191769e-03
## 3-131575     -1.218508e-02 -7.019177e-02  1.152281e-02  4.096757e-02
## 3-131584      3.561256e-02 -5.253362e-03 -3.244029e-03 -8.026883e-03
## 3-131668     -1.661279e-02  3.907607e-02 -3.046436e-02 -8.476639e-03
## 3-131669     -2.503621e-02 -1.073225e-02  1.371222e-02 -6.705466e-03
## 3-131685      4.109153e-02  1.194896e-02 -4.752105e-03  2.711267e-02
## 3-131695     -6.834004e-02  4.373392e-01 -2.131994e-02  3.307250e-02
## 3-131698     -1.252389e-02 -2.403882e-02  1.910359e-02 -5.780647e-04
## 3-131715     -3.993994e-02 -1.043223e-04 -5.304990e-03  2.375501e-02
## 3-131728     -2.623858e-02 -1.036319e-01  3.267072e-03  4.591489e-02
## 3-131765     -6.351385e-03 -1.202487e-02  1.982357e-02 -4.409160e-03
## 3-131858     -4.589318e-03 -1.269575e-03  1.236777e-03 -1.131407e-02
## 3-132025     -1.327112e-02 -3.847562e-02 -6.710431e-04  2.079548e-02
## 3-132069     -1.218413e-02 -1.089912e-02  2.554227e-02 -3.580350e-02
## 3-132097      1.687503e-03 -1.854128e-02  2.724082e-02 -1.579308e-02
## 3-132119     -2.154818e-03  2.212393e-02  1.245880e-03 -1.634979e-02
## 3-132134     -5.816364e-03 -2.475892e-02  2.135484e-02 -5.454973e-03
## 3-132134_2   -2.785642e-03  6.027124e-03 -6.164727e-02 -3.693823e-03
## 3-132155      7.825967e-03 -1.158137e-02 -1.526866e-03 -2.905676e-02
## 3-132174     -1.939641e-02 -3.966713e-04  2.049869e-02  1.428620e-02
## 3-132207     -1.214655e-02 -2.814450e-02 -1.184032e-01 -1.273079e-02
## 3-132215     -3.989389e-02  1.398430e-02 -5.092858e-03  2.461450e-02

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## 3-132325      9.265020e-02  2.133210e-02 -1.358412e-02  5.336870e-02
## 3-132325_2   -2.106115e-02  4.906771e-02 -2.864983e-02 -8.176370e-03
## 3-132346     -4.342465e-02 -2.245618e-02  2.277344e-02  6.208596e-03
## 3-132350     -4.342465e-02 -2.245618e-02  2.277344e-02  6.208596e-03
## 3-132354     -4.589318e-03 -1.269575e-03  1.236777e-03 -1.131407e-02
## 3-132355     -7.897030e-03  2.019170e-02  3.085595e-02 -1.106173e-03
## 3-132378     -2.869743e-02  5.036285e-02  5.583400e-02  1.194237e-02
## 3-132391     -2.551263e-02  8.053576e-03  1.735222e-02  2.335817e-02
## 3-132398     7.582631e-02  2.054126e-02 -9.814445e-03  4.720416e-02
## 3-132398_2   6.162908e-03  2.844818e-02  6.709934e-04 -3.733190e-02
## 3-132400     1.052025e-03 -2.748632e-02  4.950566e-02 -8.885207e-02
## 3-132458     -4.216798e-02 -9.835550e-03  4.087436e-02  3.504046e-02
## 3-132463     -7.040301e-03  1.171909e-02  2.371071e-02  5.326606e-03
## 3-132483     -2.551263e-02  8.053576e-03  1.735222e-02  2.335817e-02
## 3-132539     -2.159480e-02 -6.575156e-04  2.182222e-02  1.360522e-02
## 3-132581     1.166656e-02 -2.409936e-02  3.731231e-03 -6.695987e-02
## 3-132589     -2.274098e-02 -3.199956e-02  3.928512e-02  1.245326e-02
## 3-132589_2   1.033033e-01  3.137366e-02 -1.367538e-02  6.542018e-02
## 3-132618     -2.159480e-02 -6.575156e-04  2.182222e-02  1.360522e-02
## 3-132619     -3.506786e-02 -1.428453e-02 -8.231964e-02 -1.541101e-02
## 3-132657     -7.211598e-03  1.269537e-02  2.704613e-02  6.610720e-03
## 3-132726     3.415312e-02  8.315948e-03 -4.346477e-03  1.938056e-02
## 3-132837     3.430312e-02  9.036465e-03  2.581736e-03 -2.729514e-02
## 3-132895     -3.249021e-02 -9.274862e-03 -7.271556e-02 -1.137220e-02
## 3-132922     -2.159480e-02 -6.575156e-04  2.182222e-02  1.360522e-02
## 3-132999     -1.604232e-02 -1.834038e-03 -3.765514e-02 -6.452257e-03
## 3-133011     -6.161948e-03 -7.699785e-02  1.097726e-02  4.098073e-02
## 3-133012     2.320738e-01  6.715542e-02 -3.203035e-02  1.248414e-01
## 3-133028     1.028234e-02 -3.703602e-03  1.387635e-02 -6.282759e-03
## 3-133090     4.611368e-02  1.671964e-02 -7.183990e-03  3.348068e-02
## 3-133100     5.018018e-02  1.394754e-02 -6.660854e-03  2.379953e-02
## 3-133102     -1.071154e-02  2.951252e-02  2.193587e-02  2.629190e-03
## 3-133107     -5.005901e-03 -2.460240e-02  2.091589e-02 -4.562664e-03
## 3-133147     -7.451111e-03  1.250327e-02  2.407215e-02  6.021124e-03
## 3-133157     -3.237719e-02  1.501984e-03 -5.843238e-03  2.039779e-02
## 3-133220     -4.738819e-02 -1.738764e-02 -9.108426e-02 -1.815258e-03
## 3-133226     1.057676e-02  7.672045e-03  1.001952e-02 -2.143933e-02
## 3-133264     -1.707511e-02  4.163971e-02  2.128381e-02  5.538507e-03
## 3-133277     7.078027e-02  2.142220e-02 -1.002520e-02  4.737471e-02
## 3-133287     -8.822328e-03 -2.298355e-03  7.537068e-03 -7.097276e-03
## 3-133289     3.358737e-02  1.238493e-02 -2.164616e-03 -5.481974e-05
## 3-133326     -2.074442e-02 -1.787200e-04  2.214590e-02  1.483843e-02
## 3-133341     3.817358e-02 -1.800212e-02 -2.754927e-03 -4.869685e-02
## 3-133345     -1.321184e-02 -9.199279e-06  7.117095e-04  9.687971e-03
## 3-133351     -5.593040e-03 -3.102781e-02  2.889712e-02 -1.269911e-02
## 3-133354     -1.842120e-02  4.339337e-02 -2.511091e-02 -7.321849e-03
## 3-133381     5.815986e-02  1.092449e-02  4.423113e-03 -4.651512e-02
## 3-133385     -2.046626e-02 -5.101297e-03  2.339957e-03  1.072149e-02
## 3-133460     -2.233628e-02 -5.142840e-04  2.251464e-02  1.414623e-02
## 3-133483     3.450083e-02  1.177243e-02 -2.561735e-03 -2.593846e-04
## 3-133502     -6.367925e-03 -4.584021e-02  4.088425e-02 -1.617899e-02
## 3-133550     2.379572e-02 -6.267153e-03 -3.999661e-03 -4.931495e-03
## 3-133562     6.857416e-02  1.189377e-02 -8.815528e-03  3.555312e-02
## 3-133621     -1.810330e-02 -1.038900e-03 -4.121000e-02 -6.730377e-03

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## 3-133672 -7.816217e-02 1.141271e-01 -2.512442e-01 -3.442804e-02
## 3-133726 -2.208410e-02 7.096493e-03 -7.422662e-02 -6.559262e-03
## 3-133784 4.094741e-02 1.580191e-02 -1.810127e-03 -1.767936e-03
## 3-133813 -8.111371e-03 -2.821663e-03 6.212837e-03 4.929010e-03
## 3-133832 -6.774323e-03 -4.579998e-02 4.056875e-02 -1.606981e-02
## 3-133859 -6.929131e-03 -3.221983e-03 -3.085921e-02 -4.166058e-03
## 3-133873 -5.341290e-03 -3.536679e-02 3.235109e-02 -1.259349e-02
## 3-133873_2 -1.500427e-03 -2.570279e-02 5.273591e-02 -4.067508e-02
## 3-133879 3.711393e-03 -1.947931e-02 -2.170157e-02 -1.067527e-02
## 3-133895 5.513027e-02 4.848000e-03 -8.270247e-03 2.611412e-02
## 3-133896 1.109588e-02 -9.714658e-03 -5.803212e-03 -4.128842e-02
## 3-133915 -7.489179e-03 1.614675e-02 3.135003e-02 5.558142e-03
## 3-133920 -1.505576e-02 4.183649e-03 6.059545e-03 1.281785e-02
## 3-133935 1.067304e-02 5.274070e-04 4.404764e-03 -2.373018e-02
## 3-133938 -8.068362e-03 -8.790754e-02 1.340242e-02 4.594555e-02
## 3-133976 8.666753e-03 -1.645254e-02 -5.811974e-04 -2.735039e-02
## 3-133995 -7.381117e-02 1.026842e-01 -2.050178e-01 -3.035719e-02
## 3-134087 -2.074442e-02 -1.787200e-04 2.214590e-02 1.483843e-02
## 3-134087_2 1.099534e-03 -1.623979e-02 2.860477e-02 -1.588624e-03
## 3-134088 -2.613797e-03 1.131483e-02 -4.043220e-02 -3.682007e-03
## 3-134098 4.788221e-02 1.779396e-02 -2.294202e-03 -2.437765e-03
## 3-134114 -2.074442e-02 -1.787200e-04 2.214590e-02 1.483843e-02
## 3-134148 2.448007e-03 -2.321188e-02 -2.239957e-02 -8.795837e-03
## 3-134314 -1.814394e-02 -3.023455e-02 -1.170530e-02 1.106895e-02
## 3-134343 -2.617705e-02 6.080691e-02 3.192288e-02 8.889106e-03
## 3-134364 -9.587335e-04 -1.845506e-02 3.436458e-02 -1.155301e-02
## 3-134396 -2.074442e-02 -1.787200e-04 2.214590e-02 1.483843e-02
## 3-134421 -7.761145e-03 1.402956e-02 3.085863e-02 7.477881e-03
## 3-134421_2 5.477896e-03 -1.809989e-02 -1.702887e-05 -2.546951e-02
## 3-134461 -4.894916e-03 -4.299679e-02 3.734669e-02 -1.257573e-02
## 3-134471 2.785792e-02 1.576572e-02 -3.946750e-03 7.515552e-03
## 3-134479 5.786815e-02 1.418076e-02 -6.966703e-03 3.288149e-02
## 3-134526 5.345458e-02 1.677193e-02 -2.392020e-03 2.808848e-03
## 3-134532 -7.723417e-03 -5.268693e-02 4.704272e-02 -1.903252e-02
## 3-134539 -7.723417e-03 -5.268693e-02 4.704272e-02 -1.903252e-02
## 3-134571 -1.604232e-02 -1.834038e-03 -3.765514e-02 -6.452257e-03
## 3-134597 -2.667541e-02 3.446774e-02 7.057096e-02 2.276431e-02
## 3-134798 1.958978e-01 3.917858e-02 -2.602555e-02 8.592285e-02
## 3-134826 -1.549027e-02 3.598435e-02 -2.436619e-02 -6.779900e-03
## 3-134919 -7.903209e-03 1.673427e-02 3.286648e-02 6.037799e-03
## 3-134959 -9.680536e-03 -1.921210e-02 -5.609897e-02 -5.651681e-03
## 3-134976 -2.610692e-02 6.076104e-02 3.058172e-02 9.880522e-03
## 3-135026 1.966986e-03 -1.528323e-02 3.122050e-02 -1.498184e-02
## 3-135144 -1.721134e-02 -6.715749e-03 8.982304e-03 -9.815997e-03
## 3-135149 2.288733e-02 -6.055637e-03 -4.530327e-03 -1.937764e-05
## 3-135174 1.985051e-03 -2.516097e-02 -2.241393e-02 -8.820996e-03
## 3-135192 -3.039824e-02 6.839215e-02 4.112126e-02 5.169470e-03
## 3-135193 -8.833546e-03 1.943777e-02 -3.964036e-02 -5.947951e-03
## 3-135202 -1.260255e-02 7.395808e-03 1.036054e-02 1.192693e-02
## 3-135203 -2.151298e-02 -6.392815e-03 5.424792e-03 -1.162833e-04
## 3-135217 -1.260255e-02 7.395808e-03 1.036054e-02 1.192693e-02
## 3-135280 -1.070354e-02 -3.035663e-03 1.656177e-03 7.159560e-03
## 3-135293 -6.733955e-03 6.095021e-03 2.302680e-02 6.904404e-03
## 3-135345 6.746114e-02 2.187002e-02 -7.444967e-03 4.143807e-02

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## 3-135382      8.002611e-03 -1.294124e-02  1.277811e-04 -3.029499e-02
## 3-135464      3.442030e-02 -3.091093e-02  2.818584e-02 -7.917551e-02
## 3-135476      6.746114e-02  2.187002e-02 -7.444967e-03  4.143807e-02
## 3-135503      8.002611e-03 -1.294124e-02  1.277811e-04 -3.029499e-02
## 3-135509     -1.008126e-02 -3.646433e-03 -4.824650e-02 -1.879366e-03
## 3-135610     -1.529542e-02  3.582637e-02 -2.421196e-02 -6.896805e-03
## 3-135621      1.207296e-02  1.339232e-02 -9.976557e-04 -2.450587e-02
## 3-135629     -2.226696e-02 -1.447421e-01  1.468188e-02  6.460822e-02
## 3-135634      2.322274e-02 -2.700571e-03  1.161220e-02 -3.546171e-02
## 3-135661      3.817506e-02  9.473540e-03  3.402348e-04 -6.229722e-03
## 3-135661_2   -1.219508e-02  1.384895e-02  1.086210e-02  8.892488e-03
## 3-135681     -6.430449e-02 -1.561400e-03  1.625875e-02  3.097716e-02
## 3-135708     -4.595595e-03  1.101763e-02  2.353968e-02  1.779880e-03
## 3-135737     -2.523775e-02 -3.615911e-02  1.379808e-01 -6.773469e-02
## 3-135761     -4.046066e-02 -4.954338e-03  5.108029e-03  2.578141e-02
## 3-135851     -2.645803e-02 -1.055027e-02 -7.385104e-02 -1.170757e-02
## 3-135879     -2.901932e-02  6.406640e-02 -8.997963e-02 -1.466944e-02
## 3-135894      2.301158e-03 -2.438958e-02 -2.225277e-02 -9.139342e-03
## 3-135927     -2.013190e-02 -5.402119e-02 -1.318387e-02  1.571606e-02
## 3-135958     -1.879788e-03  9.179670e-03 -2.230149e-02 -1.789501e-03
## 3-135971      3.973055e-02  1.265311e-02 -5.073215e-03  1.322465e-02
## 3-136002      8.669269e-02  1.353345e-02 -1.215588e-02  4.485346e-02
## 3-136008      2.754825e-02 -3.203061e-02  2.442217e-02 -7.136279e-02
## 3-136019     -2.710351e-02  6.450647e-02  3.799780e-02  4.257811e-03
## 3-136039     -2.953901e-01 -3.081855e-01  1.939560e-02  2.131442e-02
## 3-136085     -1.608432e-02  3.943030e-02 -4.617387e-02 -9.535317e-03
## 3-136104     -9.767437e-03 -4.792909e-03 -4.929256e-02 -2.767352e-03
## 3-136130     -2.479454e-02  9.047539e-03  1.052297e-02  2.235035e-02
## 3-136175     -8.456483e-03 -2.565011e-02  2.174908e-03  7.931087e-03
## 3-136195      1.791295e-03 -2.322552e-02 -2.121995e-02 -8.574102e-03
## 3-136216     -2.254705e-01  3.102145e-01 -8.477059e-03  1.459899e-02
## 3-136218     -7.832398e-03  1.653977e-02  3.137175e-02  3.641177e-03
## 3-136227     -1.926738e-02  2.971710e-02  1.783421e-02  5.767195e-03
## 3-136321     -6.980407e-03 -3.435250e-02  3.349915e-02 -1.376734e-02
## 3-136343      2.871336e-01  3.244602e-01  8.334765e-02 -9.903927e-02
## 3-136347      5.066417e-02  1.691929e-02  1.026849e-02 -5.113935e-02
## 3-136408      2.432595e-01  3.320984e-01  1.157659e-01 -6.339191e-02
## 3-136444     -3.481899e-02  1.129288e-02  1.712679e-02  2.855621e-02
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## 3-136466      2.564964e-02 -6.046512e-03 -4.588755e-03 -2.491268e-03
## 3-136474     -2.242066e-02 -1.974709e-03 -4.283513e-03  1.307946e-02
## 3-136508     -2.074442e-02 -1.787200e-04  2.214590e-02  1.483843e-02
## 3-136595     -1.962081e-02 -1.062185e-02  1.976429e-02  1.270688e-02
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## 3-136835     -8.441675e-03 -3.192881e-02 -2.415052e-03  9.161097e-03
## 3-136848     -6.307896e-03  1.329440e-02 -3.453005e-02 -5.702147e-03
## 3-136872     -8.285613e-03  1.756227e-02 -2.747463e-02 -5.033039e-03
## 3-136949      2.305053e-02 -6.258802e-03 -3.913210e-03 -4.326253e-03
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## 3-137031 -2.609497e-02 6.462889e-02 3.409411e-02 7.322035e-03
## 3-137032 -1.538587e-02 -1.653422e-03 -3.589232e-02 -6.433801e-03
## 3-137040 -4.488544e-02 4.958163e-02 -9.781938e-02 -1.317827e-02
## 3-137056 -2.490661e-02 6.027465e-02 2.976102e-02 7.818157e-03
## 3-137191 4.769143e-03 5.449992e-03 1.896168e-02 -1.898611e-02
## 3-137212 -1.032771e-02 -4.372797e-02 -5.968720e-03 6.962777e-03
## 3-137259 9.151218e-02 3.376059e-02 -1.559814e-02 6.029464e-02
## 3-137298 3.201655e-03 -1.914742e-02 2.861605e-02 -1.441188e-02
## 3-137302 1.152778e-02 -1.901530e-02 8.316811e-03 -4.111960e-02
## 3-137335 -7.625568e-03 1.495455e-02 2.885770e-02 4.792334e-03
## 3-137433 1.190799e-03 -1.670566e-02 -3.618141e-02 -6.915559e-04
## 3-137438 9.260145e-02 3.398253e-02 -1.528972e-02 5.886955e-02
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## 3-137588 2.473910e-02 -3.979033e-03 3.483203e-03 -4.248468e-02
## 3-137741 -9.097249e-03 -3.310068e-02 -2.760305e-03 9.303741e-03
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## 3-139745 -2.901963e-02 1.681061e-02 3.247774e-02 2.517520e-02
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## 3-140337 -1.102540e-02 2.201542e-02 -5.029391e-02 -2.728527e-03
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## 3-140474 -1.562092e-02 4.174501e-02 -5.970770e-02 -1.158731e-02
## 3-140540 -1.571888e-02 2.138495e-02 -6.863596e-02 -4.201649e-03
## 3-140545 4.369532e-02 1.306129e-02 -5.794414e-03 2.583516e-02
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## 3-140657 -1.228761e-02 1.755785e-02 -6.433910e-02 -3.657686e-03
## 3-140701 -2.351984e-02 -3.121979e-02 4.222220e-02 7.094015e-03
## 3-140735 -1.309467e-02 -8.370694e-03 8.197560e-03 7.134423e-03
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## 3-140838 2.662871e-02 -5.771935e-03 2.466560e-03 -6.075353e-02
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## 3-140988 -8.621223e-02 -2.222297e-01 6.004055e-02 9.649413e-02
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## 3-141235      4.546545e-02  4.352697e-03 -5.754935e-03  1.885452e-02
## 3-141263     -1.017841e-02  2.707702e-02 -1.672683e-02 -4.916309e-03
## 3-141392     -1.396749e-02 -2.288212e-02  4.163454e-02  7.698882e-03
## 3-141425     -1.447033e-02 -5.668571e-02  1.604795e-03  3.057396e-02
## 3-141445     -1.617943e-04 -3.272069e-02 -1.130566e-03 -3.870881e-03
## 3-141453      6.231079e-03  1.529978e-02 -1.818902e-03 -2.214567e-02
## 3-141468      1.242330e-03 -6.923603e-03  1.398670e-03 -2.131573e-02
## 3-141473      1.756470e-02 -1.171420e-02  1.134339e-04 -4.859064e-02
## 3-141567     -4.814603e-03  9.829700e-03  2.373864e-02  3.544360e-03
## 3-141574     -1.517107e-02  2.038933e-02  1.665618e-02  6.976294e-03
## 3-141665      2.202955e-02 -9.465510e-03 -5.584330e-03 -1.172819e-02
## 3-141679      2.238882e-02 -4.257782e-03  3.702774e-03 -3.710798e-02
## 3-141752      6.642681e-02  1.262156e-02 -9.700466e-03  3.259878e-02
## 3-141762     -7.253337e-03 -1.371843e-02  2.709270e-02 -1.164220e-02
## 3-141817     -2.204959e-01  3.106881e-01  1.641482e-02  1.118334e-02
## 3-141824     -5.418523e-02  1.286123e-01 -1.086737e-01 -1.483693e-02
## 3-141850      7.205508e-03 -1.175859e-02 -5.053540e-04 -4.886330e-02
## 3-141952      2.453765e-02 -5.911765e-03  2.580649e-04 -2.035591e-02
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## 3-141976_2   -3.327168e-02  7.790041e-03  2.871278e-02  2.659765e-02
## 3-141997     -2.145376e-01  3.333225e-01 -8.067503e-03  1.170897e-02
## 3-142114      2.238882e-02 -4.257782e-03  3.702774e-03 -3.710798e-02
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## 3-142358     -1.851269e-02 -5.029648e-03  5.734413e-03 -5.309714e-03
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## 3-142371     -2.152433e-03 -3.387637e-02  7.270247e-04 -2.230610e-03
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## 4-150148 -1.139724e-02 -7.103863e-03 -2.971995e-02 -5.345023e-04
## 4-150158 -5.499114e-03 -1.403313e-02 2.480918e-02 -2.267655e-02
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## 4-150455 -8.986664e-03 -5.002743e-02 8.297163e-03 2.843188e-02
## 4-150458 7.235381e-02 1.567540e-02 -9.480529e-03 3.737341e-02
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## 4-150490 -7.566995e-02 -1.232190e-02 6.940239e-02 5.123065e-02
## 4-150496 -6.342195e-02 -2.431744e-02 -8.901864e-02 -4.546120e-03
## 4-150504 -1.454603e-02 8.980523e-03 5.229822e-02 2.408618e-02

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## 4-150684 3.249080e-02 -2.083831e-02 -5.583964e-03 -7.791183e-02
## 4-150690 4.333821e-02 1.362218e-02 -4.341705e-04 -1.690104e-02
## 4-150716 -1.637618e-02 2.860989e-02 4.180702e-02 6.521187e-03
## 4-150744 -2.905830e-02 6.011985e-02 -1.530509e-01 -1.695269e-02
## 4-150808 -2.195568e-02 -1.485948e-02 -5.372162e-02 -1.274775e-02
## 4-150819 -5.849148e-02 1.193084e-01 -1.621408e-01 -1.909080e-02
## 4-150933 -7.670316e-03 7.391964e-03 3.168458e-02 1.560330e-02
## 4-150986 1.877540e-02 1.027864e-02 4.365962e-03 -5.236952e-02
## 4-151025 -1.615842e-02 -9.814414e-03 7.502885e-03 4.127611e-03
## 4-151094 -5.480072e-03 3.767201e-02 2.828489e-02 -1.440412e-02
## 4-151106 -1.948421e-02 3.369708e-02 -1.135146e-02 -4.188996e-03
## 4-151118 7.658911e-03 -2.145233e-02 -5.162023e-02 -2.692434e-03
## 4-151143 -8.850483e-03 1.930498e-03 2.675781e-02 1.338773e-02
## 4-151163 -5.821775e-03 -4.403775e-03 2.154960e-02 -7.264139e-02
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## 4-151243 -8.752216e-03 1.713406e-02 1.099711e-02 2.450785e-03
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## 4-151295 -2.776720e-02 -4.667720e-02 -1.812504e-02 1.653208e-02
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## 4-152966 5.250426e-02 -1.688485e-02 -1.650137e-03 -2.608288e-02
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## 4-153011 -9.315747e-03 -1.480147e-02 -6.243632e-02 -2.301707e-03
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## 4-153098 5.464714e-03 -1.292569e-02 -2.998766e-02 -1.926900e-03
## 4-153112 -5.028640e-03 8.236311e-03 2.202872e-02 6.855036e-03
## 4-153112_2 -1.939503e-02 6.055292e-03 6.117424e-03 1.655053e-02
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## 4-153200 -2.368144e-02 2.045837e-02 4.026163e-02 2.523202e-02
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## 4-153341 -3.066631e-02 -1.603657e-02 2.976111e-02 2.009055e-02
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## 4-153512 -1.699417e-02 -1.928417e-02 -1.290868e-02 9.477703e-03
## 4-153548 -6.252157e-03 3.229736e-03 1.946701e-02 1.023767e-02
## 4-153582 -1.104659e-02 -2.214194e-02 -6.424106e-02 -1.295846e-02
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## 4-153711 -5.227021e-03 -3.283656e-02 5.115286e-02 -1.757418e-02
## 4-153722 -9.859897e-03 3.732509e-02 4.226208e-02 -1.045909e-02
## 4-153772 -1.754726e-02 6.095555e-03 7.558602e-03 1.563647e-02
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## 4-153852 -6.195493e-03 -1.628336e-02 3.281329e-02 -1.260618e-03
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## 4-154251 -9.363664e-03 -1.030919e-02 2.642590e-02 -3.695885e-02
## 4-154252 -2.554842e-02 1.634666e-02 2.200731e-02 2.529596e-02
## 4-154260 -1.573181e-02 4.409600e-03 5.852450e-03 1.382251e-02
## 4-154266 -2.554842e-02 1.634666e-02 2.200731e-02 2.529596e-02
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## 4-154369 3.960746e-02 4.897254e-02 3.526439e-02 1.993969e-02
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## 4-154419 -1.689935e-02 4.815165e-03 5.455807e-03 1.459456e-02
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## 4-154510     -2.665061e-02  2.828979e-02  2.770995e-02  1.403517e-02
## 4-154522     -1.157879e-02 -1.067226e-02  2.650135e-02 -3.625914e-02
## 4-154579     -2.699358e-02  6.237206e-02  3.002977e-02  1.189425e-02
## 4-154585     -2.797283e-02 -1.193072e-02  2.853938e-02  2.507444e-02
## 4-154692      4.728237e-02  1.058200e-02 -5.708435e-03  2.983449e-02
## 4-154710      2.743535e-02  2.983564e-03 -1.511058e-04 -8.928936e-04
## 4-154747      3.208532e-02  8.420681e-03 -1.041834e-03 -2.045499e-03
## 4-154836      6.067905e-02  2.290553e-02 -7.482481e-03  4.526632e-02
## 4-155084     -2.583149e-02  3.519314e-02  3.952625e-02  1.518222e-02
## 4-155094     -4.492102e-02 -2.887713e-02  2.929435e-02  1.076272e-02
## 4-155306     -1.629856e-01 -9.291963e-02  2.420773e-02 -1.355079e-02
## 4-155355     -9.435957e-03 -2.506632e-02 -3.592469e-03  8.143944e-03
## 4-155388      1.006038e-01  2.713721e-02 -1.312343e-02  6.102403e-02
## 4-155394      2.677615e-02 -2.410337e-03 -7.925412e-04 -6.121223e-03
## 4-155415      3.062050e-02 -4.408266e-03 -2.502510e-03 -6.935916e-03
## 4-155485     -4.915149e-02 -2.991239e-02  3.052633e-02  1.029454e-02
## 4-155545      2.677615e-02 -2.410337e-03 -7.925412e-04 -6.121223e-03
## 4-155607     -1.956562e-02  1.212717e-02  1.564479e-02  1.917393e-02
## 4-155656     -3.431480e-02  3.781560e-02  6.352978e-02  1.776128e-02
## 4-155689     -2.267459e-02 -1.087551e-02  2.213512e-02  2.178529e-02
## 4-155767     -1.981285e-02 -3.014714e-04  2.183152e-02  1.356580e-02
## 4-155771      5.619020e-02  1.693978e-02  2.567225e-02 -1.773048e-02
## 4-155773      4.432178e-02  1.480226e-02 -7.229983e-03  3.349926e-02
## 4-155834     -2.519066e-02 -8.317938e-03  3.411421e-02  1.166662e-02
## 4-155843     -9.435957e-03 -2.506632e-02 -3.592469e-03  8.143944e-03
## 4-155856      1.006038e-01  2.713721e-02 -1.312343e-02  6.102403e-02
## 4-155862     -4.128250e-01  6.253213e-02 -1.503045e-01  7.884294e-02
## 4-155866     -9.435957e-03 -2.506632e-02 -3.592469e-03  8.143944e-03
## 4-155958     -6.551355e-03  2.024550e-02  2.113000e-02 -1.326285e-03
## 4-156027     -9.435957e-03 -2.506632e-02 -3.592469e-03  8.143944e-03
## 4-156088     -2.556898e-02 -1.325899e-02  2.424700e-02  1.954554e-02
## 4-156101      2.787824e-02  2.676364e-03 -3.147824e-03  7.801420e-03
## 4-156138     -1.981285e-02 -3.014714e-04  2.183152e-02  1.356580e-02
## 4-156144      4.488119e-03 -2.050649e-02  3.821522e-02 -1.837924e-02
## 4-156224     -2.957821e-02  3.142701e-02  5.016437e-02  2.220254e-02
## 4-156228      3.712929e-02  1.974227e-02  3.457545e-03 -5.672189e-02
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## 4-156391     -3.493817e-03 -5.987642e-02  7.398421e-02 -2.919984e-02
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## 4-156423      4.174569e-03 -1.429174e-02 -4.017162e-02 -1.533541e-03
## 4-156433     -3.733772e-02 -2.016677e-02 -7.791341e-02 -7.076330e-03
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## 4-156756      3.509377e-02  7.182208e-03 -3.864138e-03  1.785591e-02
## 4-156780     -2.319744e-02 -7.601336e-02  8.546993e-02 -1.602886e-02

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## 4-157161 6.926367e-02 1.986123e-02 -9.457808e-03 4.439998e-02
## 4-157162 3.310953e-02 1.303972e-02 -5.279607e-03 2.650717e-02
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## 4-157418 -1.385445e-02 -4.734652e-02 5.379541e-03 3.198834e-02
## 4-157475 -9.574923e-03 -3.660741e-02 4.533715e-02 -3.686575e-02
## 4-157498 -2.111858e-02 -3.867359e-02 4.852767e-02 -4.067123e-02
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## 4-157930 1.811675e-02 2.447650e-03 3.971272e-03 -2.590525e-02
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## 4-158835 -1.120401e-02 1.248942e-02 -1.576009e-02 4.160491e-04
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## 4-159311	-1.735264e-02	3.959535e-02	2.338938e-02	-8.391482e-04
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## 4-159711	6.971886e-02	-9.621991e-03	-2.015431e-02	1.218976e-02
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## 4-163842      3.086302e-01  6.797363e-02 -3.736039e-02  1.325663e-01
## 4-163879     -6.820997e-03 -1.972379e-02  3.522685e-02 -1.400480e-02
## 4-163972     -5.884106e-02 -1.825679e-02  2.287790e-02  3.424720e-02
## 4-163989     -1.560502e-02 -3.876834e-03  4.984272e-03 -5.223199e-03
## 4-163999      1.369422e-02 -1.592381e-02  2.285553e-04 -5.817704e-02
## 4-164030     -8.648958e-03  1.657698e-02  1.655116e-02  2.727064e-04
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## 4-164242	5.544727e-02	1.522624e-02	7.101537e-03	-7.860975e-02
## 4-164264	3.399183e-02	1.778719e-02	1.967999e-02	8.495946e-03
## 4-164268	-1.333986e-02	5.339634e-03	1.357164e-02	1.440022e-02
## 4-164308	-3.098028e-02	-1.078306e-02	3.228794e-02	2.600428e-02
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## 4-164333	-4.030140e-02	-3.172559e-02	2.452639e-02	1.787152e-02
## 4-164381	-1.560502e-02	-3.876834e-03	4.984272e-03	-5.223199e-03
## 4-164444	3.195751e-01	7.236429e-02	-4.446949e-02	1.786886e-01
## 4-164518	-1.160052e-02	3.616576e-02	5.737972e-02	-4.797577e-03
## 4-164595	1.782218e-01	4.666613e-02	-2.590621e-02	1.140172e-01
## 4-164628	-1.159160e-02	1.739926e-02	-5.319010e-02	-6.288976e-03
## 4-164678	-1.525130e-02	3.546567e-02	2.347193e-02	-9.222496e-04
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## 4-164749	-1.960348e-02	3.243028e-02	-4.085223e-02	-8.114880e-03
## 4-164813	3.068624e-02	9.284055e-03	3.545433e-03	-5.046027e-02
## 4-164836	-1.870045e-02	1.498560e-04	8.622172e-03	1.239318e-02
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## 4-165020	-1.326713e-02	7.850719e-03	-3.728964e-02	-4.497923e-03
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## 4-165132	-2.082802e-02	-4.103390e-02	-1.158661e-02	1.541554e-02
## 4-165136	-2.159728e-03	9.807784e-03	-2.207079e-02	-2.129229e-03
## 4-165163	7.976184e-02	2.940363e-02	-1.087386e-02	6.357178e-02
## 4-165201	-6.936020e-03	-2.645741e-03	1.368625e-02	4.073091e-03
## 4-165286	-1.227723e-02	6.409303e-03	-3.514966e-02	-3.880608e-03
## 4-165342	3.333671e-02	-1.055912e-02	5.417207e-03	-3.411507e-02
## 4-165427	1.391213e-01	2.791352e-02	-1.550589e-02	7.319290e-02
## 4-165451	-1.103323e-02	2.911828e-02	-2.148893e-02	-4.862039e-03
## 4-165500	-1.364792e-02	5.228927e-03	1.406347e-02	1.468787e-02
## 4-165574	4.151879e-02	-1.151169e-02	5.425331e-03	-3.398928e-02
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## 4-166922 -2.333068e-02 5.385028e-02 2.590627e-02 1.104929e-02
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## 4-169142	-1.190721e-02	-3.152460e-02	-4.333218e-03	9.215723e-03
## 4-169249	-1.326076e-03	-1.164940e-02	2.109048e-02	7.166302e-04
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## 4-172487 -1.669448e-02 2.127359e-03 2.443382e-02 2.375330e-02
## 4-172713 -6.522529e-03 -3.148734e-02 -2.992626e-04 9.552160e-03
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## 4-172931 6.274805e-03 -9.656436e-02 -1.692814e-02 -2.001834e-02
## 4-172964 -3.028251e-02 -2.352132e-03 2.635071e-03 2.480914e-02
## 4-172980 -1.094325e-02 -2.386842e-02 2.346683e-02 -4.678237e-03
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## 4-173047 -1.745280e-02 -4.707734e-03 6.891772e-03 -9.267817e-03
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## 4-178854     -1.442795e-02 -6.542611e-03  1.365867e-02 -2.351608e-02
## 4-178910     -2.194165e-02 -1.052932e-02 -6.241955e-02 -9.205110e-03
## 4-178953      4.519670e-02  1.059751e-02 -5.682723e-03  3.003886e-02
## 4-178989     -2.777646e-02 -2.357482e-02  2.159131e-02 -4.319090e-03
## 4-179015     -1.535190e-02 -6.395535e-03 -4.256918e-02 -6.388490e-03
## 4-179023     -1.322380e-02 -1.023328e-02 -3.238882e-02 -7.830679e-03
## 4-179052      3.335887e-02  8.186295e-03 -7.110967e-04  6.334250e-03
## 4-179072      3.862684e-02  9.984006e-03 -4.384954e-03 -1.048228e-02
## 4-179082     -1.847587e-02  1.186003e-03  2.347539e-02  1.895099e-02
## 4-179083     -1.847587e-02  1.186003e-03  2.347539e-02  1.895099e-02
## 4-179085     -6.506923e-03 -8.576862e-03  1.877408e-02  7.053815e-03
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## 4-179142     -2.194165e-02 -1.052932e-02 -6.241955e-02 -9.205110e-03
## 4-179157      5.976015e-02  1.454366e-02 -3.476932e-03  1.573523e-02
## 4-179186      8.282918e-03 -8.759768e-03 -3.655209e-03 -3.819268e-02
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## 4-180109     -8.159699e-02 -3.019964e-02 -1.591100e-01 -5.233861e-03
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## 4-180517 -2.985825e-02 7.340974e-02 4.090026e-02 1.082892e-02
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## 4-180588 -2.159934e-02 -1.960004e-02 2.595519e-02 1.706657e-02
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## 4-180675 4.443818e-02 -2.312211e-02 -1.759391e-02 -5.959224e-02
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## 4-180812 1.163830e-01 1.945075e-02 -1.635580e-02 6.090741e-02
## 4-180848 1.951298e-02 -7.133592e-04 1.252134e-03 -3.482477e-02
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## 4-180954 -2.741201e-01 3.086280e-01 3.420474e-02 1.957525e-02
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## 4-185385 -1.952380e-02 9.874653e-04 1.985445e-02 1.749649e-02
## 4-185392 1.635135e-02 4.759521e-03 2.670345e-03 -2.836810e-02
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## 4-185802 -9.102251e-03 -6.438570e-03 2.397104e-02 -1.225320e-02
## 4-185854 6.930307e-03 2.779926e-02 4.385875e-03 -2.228352e-02
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## 4-186029    3.961643e-02  1.227015e-02 -5.178698e-03  2.245733e-02
## 4-186040    4.168018e-02  3.080633e-04 -5.042001e-03  1.259604e-02
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## 4-186049    4.110749e-03  -2.000785e-02 -2.573011e-02 -1.181348e-02
## 4-186077  -1.116755e-02  -8.928821e-03  6.254322e-03  3.635279e-03
## 4-186113    3.508659e-02  -2.066866e-02  1.379818e-03 -7.879056e-02
## 4-186122   -9.976975e-05  4.798670e-03 -4.209799e-02  6.540529e-04
## 4-186189   -1.673053e-02  1.237479e-02  1.533007e-02  1.650627e-02
## 4-186193    1.399040e-02  7.785694e-03  3.244568e-02  5.824887e-03
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## 4-186341   -5.306185e-02  2.604968e-02 -4.036835e-04  3.460242e-02
## 4-186399  -4.823312e-03  -8.741117e-02  1.151500e-02  4.358398e-02
## 4-186416    3.075291e-01  6.993478e-02  2.709118e-02  7.056082e-02
## 4-186474    5.676999e-02  9.968187e-03 -7.981239e-03  3.063887e-02
## 4-186534  -2.159024e-02  5.768341e-02  3.419196e-02  6.368204e-03
## 4-186639  -2.048569e-02  2.990618e-02 -4.703927e-02 -3.504582e-03
## 4-186744  -2.148456e-02  -3.649902e-02  4.245591e-02  6.326156e-03
## 4-186772    5.289763e-03  -9.430927e-02  1.473760e-01 -1.798280e-01
## 4-186773    3.247410e-02  2.335951e-03 -3.724260e-03  6.705025e-03
## 4-186780  -7.946377e-03  1.591077e-02  2.389321e-02  1.136192e-03
## 4-186807  -1.156916e-02  -5.703477e-03 -4.099951e-02 -1.324263e-03
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## 4-187365  -1.718019e-02  3.656160e-02  5.220221e-02 -1.262156e-03
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## 4-187564  -3.657018e-02  -5.223786e-03 -7.640461e-02 -5.260454e-03
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## 4-187913    4.664167e-02  -4.890001e-03  4.747577e-03 -6.254723e-02
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## 4-188093 -2.755849e-02 3.788934e-02 5.096403e-02 1.494879e-02
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## 4-188210 -5.187858e-03 -2.910502e-02 -8.082342e-04 2.876071e-03
## 4-188225 -2.717017e-02 -1.991204e-02 2.088495e-02 9.360345e-03
## 4-188268 -1.454114e-01 -5.361778e-02 -1.928743e-01 -1.738931e-04
## 4-188354 3.875100e-02 5.232622e-03 -5.267592e-03 1.934887e-02
## 4-188484 -2.701111e-02 -3.618275e-02 3.585698e-02 7.552793e-03
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## 4-188522 -2.172960e-02 3.285281e-02 -4.001194e-02 -8.970545e-03
## 4-188571 -1.558042e-02 2.120377e-02 3.367573e-02 8.209786e-03
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## 4-188619 7.495545e-02 2.161622e-02 -9.210814e-03 4.832393e-02
## 4-188627 -2.083557e-02 -2.964473e-02 -1.376029e-02 9.803090e-03
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## 4-188734 -1.215676e-02 1.286710e-02 1.992491e-02 1.091649e-02
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## 4-188982 -2.176456e-02 -2.067153e-02 2.303196e-02 6.213448e-03
## 4-188982_2 9.044050e-03 -1.167629e-02 6.811600e-04 -4.417532e-02
## 4-189027 -2.083557e-02 -2.964473e-02 -1.376029e-02 9.803090e-03
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## 4-189166 2.285772e-02 -5.989794e-03 3.822041e-03 -6.952697e-02
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## 4-189343 -4.224861e-02 2.035910e-02 1.366096e-02 3.352616e-02
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## 4-190891 -1.618715e-03 -1.326537e-02 2.113901e-02 1.907983e-03
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## 4-191237 -2.111077e-02 -1.946410e-02 2.240465e-02 6.547577e-03
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## 4-191295 -7.351261e-03 1.130914e-02 1.792792e-02 3.275988e-03
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## 4-191341 5.991830e-02 1.035102e-02 6.259699e-04 -1.114010e-03
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## 4-191839 -3.513480e-02 -1.197132e-02 3.231508e-02 3.188071e-02
## 4-191851 -1.964018e-02 9.331389e-03 7.450441e-03 1.759011e-02
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## 4-191914	-1.818221e-02	-1.364215e-02	1.039439e-02	5.862585e-03
## 4-191947	-7.145522e-03	-2.085542e-03	-5.601415e-02	-5.308115e-03
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## 4-192047	-7.215541e-04	5.166043e-05	-2.563178e-02	-6.541768e-04
## 4-192107	3.848733e-02	1.219545e-02	-6.110440e-03	2.439623e-02
## 4-192108	-1.050584e-02	1.960342e-02	3.660727e-02	7.338694e-05
## 4-192227	7.131517e-02	1.575066e-02	-9.028283e-03	3.718942e-02
## 4-192249	-3.087083e-03	-1.053715e-02	-4.505883e-02	-1.754477e-03
## 4-192249_2	-1.645243e-02	-9.690518e-02	1.104021e-02	6.068875e-02
## 4-192303	-1.851237e-02	9.218335e-03	7.311710e-03	1.688964e-02
## 4-192361	-2.491872e-02	5.859470e-02	3.218595e-02	1.508735e-03
## 4-192365	5.946902e-03	-8.460482e-03	-4.111666e-03	-2.976901e-02
## 4-192378	-1.730422e-02	-8.083023e-03	-4.895491e-02	-6.408504e-03
## 4-192486	6.907238e-02	2.001927e-02	-9.215710e-03	4.954065e-02
## 4-192545	9.817501e-02	2.591932e-02	6.966064e-03	-6.036572e-02
## 4-192556	6.103610e-03	-9.796651e-03	4.231183e-03	-3.832805e-02
## 4-192679	4.669503e-03	7.060369e-03	1.192248e-02	-1.990197e-02
## 4-192682	2.329232e-02	-5.602771e-03	2.096903e-03	-2.017399e-02
## 4-192737	-1.871937e-02	1.273224e-02	8.243749e-03	1.861901e-02
## 4-192738	3.556678e-03	-1.854239e-02	-2.550807e-02	-9.050195e-03
## 4-192744	-1.871937e-02	1.273224e-02	8.243749e-03	1.861901e-02
## 4-192771	-1.063388e-02	-4.788535e-03	-4.346492e-02	-3.962819e-03
## 4-192784	-2.492355e-02	5.146573e-02	-4.677735e-02	-1.356255e-02
## 4-192828	-1.063388e-02	-4.788535e-03	-4.346492e-02	-3.962819e-03
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## 4-192905	2.255237e-02	-7.293868e-03	-6.859931e-04	-1.104663e-02
## 4-192906	-3.594130e-03	-7.520526e-03	-3.543369e-02	-1.438329e-03
## 4-192937	4.091091e-03	5.582132e-02	2.332954e-02	-4.405037e-02
## 4-192948	-2.715064e-02	-2.233237e-03	-6.129498e-03	1.585928e-02
## 4-192951	-3.822697e-03	-6.874885e-03	-3.416929e-02	-1.425920e-03
## 4-192951_2	-1.295221e-02	-3.624017e-03	-3.238600e-02	-6.360013e-03
## 4-192969	5.636125e-04	-7.766397e-03	-2.669975e-03	-3.225669e-02
## 4-192978	1.105769e-02	9.781319e-03	1.447396e-02	-2.688458e-02
## 4-193007	3.561312e-03	-1.796543e-02	-2.420006e-02	-8.856245e-03
## 4-193019	-5.687341e-03	1.699087e-03	3.083465e-02	8.082584e-03
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## 4-193062	-7.548376e-03	-4.945784e-03	-3.048474e-02	-4.283234e-03
## 4-193091	1.526553e-02	-7.311124e-02	-2.502324e-02	-2.781419e-02
## 4-193132	2.222524e-02	-2.691124e-02	-2.875866e-02	-3.072232e-02
## 4-193170	-2.589986e-02	5.368175e-02	4.206225e-02	8.202178e-03
## 4-193197	3.907610e-03	-3.107163e-02	5.476563e-02	-2.310092e-02
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## 4-193328	1.901252e-02	-4.341195e-03	1.382232e-03	-1.972121e-02
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## 4-193641 -1.816182e-02 4.256393e-02 2.733399e-02 5.989263e-03
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## 4-193690 -2.254889e-02 -1.504877e-02 -4.168471e-02 2.991427e-03
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## 4-193859 -2.050440e-02 4.822613e-02 2.988021e-02 7.462840e-03
## 4-193987 -1.844803e-02 4.320695e-02 2.908270e-02 -2.366629e-03
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## 4-196996   -2.211891e-02  5.204742e-02  2.372421e-02  9.154596e-03
## 4-197003    5.095878e-02  1.140799e-02 -6.308476e-03  2.668763e-02
## 4-197029   -2.502067e-03 -2.713932e-02 -2.731835e-03 -1.983649e-04
## 4-197087    9.624141e-03  2.279416e-02  7.752023e-03 -4.418741e-02
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## 4-199829 -4.891447e-03 -1.527569e-02 2.322666e-02 -1.565708e-02
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## 5-205620	-3.132848e-02	-1.149305e-02	-8.404929e-02	-1.119405e-02
## 5-205632	5.146111e-02	2.018279e-02	5.310790e-03	-7.316925e-02
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## 5-205785	-2.150949e-02	4.445186e-02	-2.925595e-02	-7.100988e-03
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## 5-206893	-1.255999e-02	-1.030003e-02	-2.052622e-02	-8.233922e-03
## 5-206904	-2.608465e-02	3.128635e-02	8.502052e-02	2.841654e-02
## 5-206989	-2.621438e-02	-4.242965e-02	5.936305e-02	4.963221e-03
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## 5-207028	3.093704e-02	9.676809e-03	-1.464948e-03	3.281221e-03
## 5-207113	-3.132848e-02	-1.149305e-02	-8.404929e-02	-1.119405e-02
## 5-207124	-2.025654e-02	1.505789e-02	1.860863e-02	1.801050e-02
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## 5-207429	-2.794680e-02	-4.178629e-02	6.415186e-02	1.232715e-02
## 5-207455	-1.299716e-02	-2.983099e-02	2.876011e-02	-1.230620e-02
## 5-207567	-2.979448e-02	-1.044477e-03	-6.416388e-03	1.853125e-02
## 5-207660	-8.112694e-03	5.032618e-03	3.012644e-02	1.557686e-02
## 5-207709	-2.836574e-02	-1.067499e-02	-7.703852e-02	-1.012290e-02
## 5-207716	-2.846819e-02	2.247869e-02	-1.266886e-01	-1.247510e-02
## 5-207748	2.908470e-02	1.335402e-02	4.173367e-03	-4.974400e-02
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## 5-207868	-6.120765e-03	-2.906639e-02	3.044586e-02	-2.399249e-03
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## 5-207946	-5.243551e-03	1.947654e-03	1.765591e-02	1.047844e-02
## 5-207988	3.723910e-02	5.521017e-03	-1.918847e-04	-7.406784e-03
## 5-208171	8.558312e-02	2.424752e-02	4.114649e-03	-4.470206e-02
## 5-208193	-1.132692e-02	-2.173965e-03	1.275163e-02	1.010752e-02
## 5-208202	7.435234e-03	-2.533819e-02	-5.554718e-02	-2.921390e-03
## 5-208295	-1.493043e-02	3.749666e-02	-2.711524e-02	-7.111637e-03
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## 5-208311	-1.382745e-01	-2.691033e-01	1.359464e-01	7.473029e-02
## 5-208332	-2.998968e-02	-1.159385e-02	-8.089411e-02	-1.077039e-02
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## 5-208394	3.690337e-02	2.701045e-03	-6.019932e-05	-2.874488e-03
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## 5-208479	-2.699358e-02	6.237206e-02	3.002977e-02	1.189425e-02
## 5-208589	-3.745579e-02	-9.036178e-03	3.781585e-02	3.181055e-02
## 5-208594	-1.012280e-02	2.651168e-02	3.099892e-02	-4.519964e-03
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## 5-208920	3.404308e-02	2.166828e-02	1.820646e-02	-8.142455e-02

## 5-209066	9.159370e-03	2.119791e-02	1.263449e-03	-2.733881e-02
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## 5-209538	2.735179e-02	-1.118013e-02	1.746248e-03	-2.760005e-02
## 5-209572	-4.504443e-02	5.504444e-02	-9.624499e-02	-1.528325e-02
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## 5-209680	-9.454626e-03	-5.664207e-02	7.149214e-02	-2.268330e-02
## 5-209776	3.053988e-02	5.632762e-03	1.815763e-03	-1.530756e-02
## 5-209805	-7.724525e-03	1.228994e-02	-5.543967e-03	-1.464850e-03
## 5-209859	-4.487871e-02	5.830088e-02	-8.668722e-02	-1.548218e-02
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## 5-209962	-1.451569e-02	-2.662321e-02	-1.292620e-02	1.110528e-02
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## 5-210004	-1.087130e-03	-1.262659e-02	-7.421146e-02	-2.210731e-03
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## 5-211260	9.653547e-03	-1.434321e-02	1.659120e-03	-3.187567e-02
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## 5-215681	-1.151522e-02	-2.245190e-03	2.316319e-03	-1.444829e-02
## 5-215739	4.926815e-02	1.266410e-02	-4.192728e-03	2.142360e-02
## 5-215740	6.135788e-02	-5.336722e-04	-2.289031e-02	5.914854e-03
## 5-215758	-5.063115e-03	-2.075829e-02	3.498953e-02	-2.054218e-02
## 5-215759	-1.057445e-01	2.256668e-01	-5.467854e-02	-7.606766e-03
## 5-215770	-2.946341e-03	9.857112e-03	-2.087348e-02	-3.032188e-03
## 5-215865	-9.667028e-03	1.868888e-02	-2.929419e-02	-3.811507e-03
## 5-215928	-1.914712e-02	-3.316002e-04	-1.684681e-03	1.020047e-02
## 5-215933	-4.398329e-03	-2.349841e-02	3.629921e-02	-2.087773e-02
## 5-215963	-4.931960e-03	-1.964678e-02	2.604358e-02	-2.270972e-02
## 5-216009	-3.129959e-02	-1.143127e-02	-9.945293e-02	-9.874093e-03
## 5-216051	-2.286700e-02	5.553906e-02	4.609030e-02	-5.617419e-03
## 5-216064	4.824104e-02	-1.323417e-02	7.106829e-03	-4.185151e-02
## 5-216088	-1.657940e-02	2.577460e-02	4.820646e-02	1.639657e-02
## 5-216116	1.089777e-02	-8.542918e-03	-1.628618e-03	-4.560793e-02
## 5-216162	5.061148e-02	1.211520e-02	-3.383228e-03	1.977880e-02
## 5-216227	-3.828310e-02	-1.813837e-02	4.600590e-02	2.515320e-02
## 5-216256	-5.071216e-02	3.013939e-02	3.814706e-02	4.670161e-02
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## 5-216286	3.765089e-02	1.276817e-02	-4.312226e-03	-2.926167e-02
## 5-216296	-5.517400e-03	-2.065009e-02	3.596571e-02	-2.605883e-02
## 5-216386	-4.157545e-02	-4.407055e-02	-1.951006e-02	-5.324994e-04
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## 5-223055 7.252883e-02 1.704954e-02 2.232090e-03 -4.568208e-02
## 5-223097 -1.924470e-02 1.412294e-03 -1.522746e-03 1.051786e-02
## 5-223099 -1.712031e-04 -5.913278e-03 -4.303858e-02 -2.804745e-03
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## 5-223120 -2.761030e-02 1.827570e-02 2.574283e-02 2.319053e-02
## 5-223184 1.001257e-01 -1.563334e-02 -1.182451e-02 -1.969025e-02
## 5-223191 -5.447911e-02 -2.137740e-02 8.759229e-02 1.162432e-02
## 5-223254 -2.318531e-02 -1.646858e-02 1.841362e-02 1.225402e-02
## 5-223273 -5.921526e-03 1.777491e-05 5.129408e-04 -9.109917e-03
## 5-223282 -5.860802e-02 2.655068e-02 5.816897e-02 4.457076e-02
## 5-223319 -4.808736e-03 8.976392e-03 1.685586e-02 3.790803e-03
## 5-223368 6.314987e-03 -2.359011e-03 1.972832e-02 -1.428837e-02
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## 5-223569   -2.612146e-02 -2.110093e-02 -4.198519e-02  4.254703e-03
## 5-223637   -5.907512e-04  1.239284e-04 -2.968932e-02 -1.864506e-03
## 5-223704   -9.457475e-03 -4.045444e-02  7.368926e-03  2.527685e-02
## 5-223723   -7.853250e-02 -4.593039e-02 -1.537417e-01 -7.141912e-03
## 5-223890    1.065330e-01  3.326025e-02 -1.480360e-02  7.581059e-02
## 5-223914   -2.549336e-02 -1.316454e-02  2.215224e-02  2.563014e-02
## 5-223983    2.331194e-01  2.595088e-01 -1.783946e-02 -7.593715e-02
## 5-223996   -4.964087e-04  3.685245e-02  1.882396e-02 -2.713105e-02
## 5-224028   -1.280752e-03  1.310500e-03 -2.977749e-02 -1.842377e-03
## 5-224044    1.069641e-01  2.665835e-02  6.822020e-03 -9.914363e-02
## 5-224056   -4.187432e-02 -3.245865e-02 -8.185693e-02 -3.545445e-03
## 5-224099   -6.536833e-03  2.407158e-02  2.347210e-02 -1.816771e-03
## 5-224106   -1.924470e-02  1.412294e-03 -1.522746e-03  1.051786e-02
## 5-224124    1.699301e-01  1.592307e-01 -4.768944e-03  1.345106e-02
## 5-224133   -1.579654e-02  3.589082e-02 -2.168508e-02 -7.818854e-03
## 5-224184   -2.549336e-02 -1.316454e-02  2.215224e-02  2.563014e-02
## 5-224221    2.423332e-02 -5.169311e-03  3.618886e-03 -2.365847e-02
## 5-224374    4.397587e-02  1.794417e-02 -6.805844e-03  3.861572e-02
## 5-224464   -1.924470e-02  1.412294e-03 -1.522746e-03  1.051786e-02
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## 5-224586   -1.075347e-02 -1.729585e-02 -8.963142e-03  4.824014e-03
## 5-224595   -8.753767e-03  5.975623e-02  6.635902e-02 -2.282685e-02
## 5-224632   -1.045731e-02  2.546691e-02 -2.581904e-02 -2.304416e-03
## 5-224648    2.934256e-02  6.455210e-03 -7.434141e-04  5.145670e-03
## 5-224731   -5.702622e-02  4.180891e-02  5.388437e-02  5.150481e-02
## 5-224732   -5.430950e-03 -2.042616e-02 -4.605468e-02 -6.540602e-03
## 5-224742   -1.976814e-03  3.924589e-03 -3.061108e-02 -1.659800e-03
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## 5-224759   -1.202441e-03 -9.617383e-03  1.994130e-02  8.791488e-04
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## 5-224819   -2.089639e-02 -8.172252e-03 -5.619076e-02 -7.151353e-03
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## 5-224949   -1.577496e-02  1.865474e-02 -4.300515e-02 -8.524315e-03
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## 5-225344_2 -2.612934e-02 -9.144753e-03 9.296023e-03 1.551187e-02
## 5-225359 -3.643064e-01 -1.089104e-02 -1.866604e-01 6.307177e-03
## 5-225521 -1.486764e-02 -1.933347e-02 -1.246378e-02 9.772674e-03
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## 5-225842 -4.251040e-02 -3.369332e-02 -8.227481e-02 -2.468198e-03
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## 5-226009 -1.241178e-02 -1.067625e-02 -3.276320e-02 -9.182375e-03
## 5-226036 -2.128581e-03 -3.152725e-02 2.481315e-05 5.537248e-04
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## 5-226111 -1.150171e-02 9.547600e-03 2.114372e-02 5.792397e-03
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## 5-226589 4.178549e-02 -3.303337e-02 -6.704089e-02 -4.667669e-02
## 5-226715 -3.231619e-03 6.410342e-03 -3.167822e-02 -1.918824e-03
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## 5-227547 -1.950943e-02 4.436518e-02 2.477358e-02 -1.344161e-03
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## 5-227577 -1.172108e-02 1.188759e-02 2.478163e-02 7.500752e-03
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## 5-227790 -1.588533e-02 -6.395610e-02 8.405451e-02 -9.485950e-03
## 5-227793 -1.585761e-02 1.060868e-02 3.035542e-02 1.234142e-02
## 5-227802 -4.350737e-02 2.552203e-02 4.138578e-02 3.660863e-02
## 5-227854 5.055608e-02 1.040860e-02 -5.354323e-03 1.449336e-02
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## 5-228257 6.793306e-02 2.276371e-02 7.276804e-03 -8.313708e-02
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## 5-229443 -7.774613e-03 2.727151e-02 2.658822e-02 -1.228222e-03
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## 5-229733 -1.961652e-02 -1.029449e-02 -5.961486e-02 -9.607442e-03
## 5-229835 -3.281259e-02 7.002305e-02 3.581143e-02 7.309129e-03
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## 5-229941 -1.378470e-02 -7.599781e-03 2.301349e-03 -3.910876e-03
## 5-229942 -1.162910e-01 -6.104002e-02 -2.083281e-01 -2.833568e-02
## 5-229981_2 2.658080e-01 3.191563e-02 -2.580859e-02 -5.356808e-02
## 5-230013 -9.101789e-03 3.456456e-03 -4.431910e-02 -2.917248e-03
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## 5-230125 5.252064e-02 6.706522e-03 -8.392879e-03 2.711587e-02
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## 5-231345 -1.424955e-02 -4.673059e-03 1.634089e-02 1.131469e-02
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## 5-233426     -7.232265e-03 -1.992557e-02  2.159177e-02 -3.443908e-04
## 5-233464      4.329731e-02 -1.056084e-02  4.076569e-03 -5.995973e-02
## 5-233580     -1.073929e-02  1.275333e-02  2.551232e-02  8.309016e-03
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## 5-237786	-2.355451e-02	-1.295194e-02	-5.809167e-02	-1.017511e-02
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## 5-242479	-2.795048e-03	2.155491e-02	3.987977e-02	-2.499861e-02
## 5-242487	-7.673742e-04	-1.905358e-02	2.303538e-02	-4.628262e-03
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## 5-242531	-2.466788e-02	5.551810e-02	2.630435e-02	9.767452e-03
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## 5-242568	-2.466788e-02	5.551810e-02	2.630435e-02	9.767452e-03
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## 5-242677	-2.604472e-02	7.950988e-04	-4.386202e-03	1.837002e-02
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## 5-242926	-3.497456e-02	8.427128e-02	-2.994884e-02	-1.494360e-02
## 5-242948	-1.678021e-02	-1.098154e-02	2.176116e-02	8.324568e-03
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## 5-243123	2.341628e-02	5.255951e-03	2.004057e-03	-1.719321e-02
## 5-243181	9.452354e-03	1.234584e-02	-3.397889e-04	-2.240430e-02
## 5-243186	4.484580e-03	2.472627e-02	4.574801e-03	-1.881636e-02
## 5-243233	-5.061929e-02	-1.737961e-01	-3.142051e-02	5.791019e-02
## 5-243317	-1.568456e-02	3.246559e-03	4.728201e-03	1.274105e-02
## 5-243377	3.096377e-03	-1.540219e-02	3.043255e-02	-1.325527e-02
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## 5-243560	2.999104e-02	-4.095573e-03	-1.687273e-03	-7.680906e-03
## 5-243645	9.009387e-03	-5.735117e-03	-1.918975e-03	-3.597144e-02
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## 5-243865	-5.022842e-02	1.451025e-01	1.351337e-01	-2.466700e-02
## 5-243873	2.999104e-02	-4.095573e-03	-1.687273e-03	-7.680906e-03
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## 5-244543 -6.911316e-03 3.624815e-03 2.125989e-02 1.161838e-02
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## 5-249295	-8.943903e-03	8.878922e-03	2.088171e-02	7.262038e-03
## 5-249301	-3.937183e-03	-2.347442e-02	1.972941e-02	-8.208613e-03
## 5-249346	-2.187221e-02	-8.008304e-03	4.885364e-03	1.357812e-02
## 5-249467	-1.985004e-02	-5.666051e-03	-5.108301e-02	-6.162852e-03
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## 5-249683	8.731744e-02	2.348131e-02	5.468710e-03	-4.082789e-02
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## 6-254386 -3.965059e-02 2.708795e-01 -1.950670e-02 1.004430e-01
## 6-254438 -1.949665e-02 3.467074e-02 -4.197385e-02 -9.150087e-03
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## 6-255744 5.003971e-03 1.288736e-02 7.877902e-03 -1.666212e-02
## 6-255786 -3.715894e-02 -1.908640e-02 -8.359943e-02 -1.592286e-02
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## 6-255961 -1.975205e-02 8.774058e-03 5.202652e-03 1.723399e-02
## 6-255985 -2.884546e-02 4.283932e-02 -6.400525e-02 -1.162447e-02
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## 6-260102	7.217674e-03	1.581165e-03	4.675965e-03	-3.024314e-02
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## 6-260302	-2.088731e-02	-6.939438e-03	1.621204e-02	2.211224e-02
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## 6-260371	3.389423e-02	5.941205e-03	-2.211438e-03	5.737116e-03
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## 6-260676	1.237068e-02	-1.098971e-02	-4.931554e-03	-2.520675e-02
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## 6-261033	-1.842038e-02	1.970703e-03	5.809007e-03	1.540005e-02
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## 6-261165	-1.997631e-02	-2.933733e-04	2.141683e-02	1.438516e-02
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## 6-261845	-1.258874e-02	1.586264e-02	2.197740e-02	7.342248e-03
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## 6-272137	-1.950130e-02	-3.219313e-02	-2.381381e-02	-4.020632e-05
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## 6-272373	-1.034892e-02	5.170366e-03	1.751500e-02	1.080345e-02
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## 6-272572	1.190271e-02	1.147287e-02	-1.383572e-03	-2.388562e-02
## 6-272601	1.642139e-02	-1.685617e-02	1.996420e-03	-2.962617e-02
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## 6-290934	-4.614200e-03	-4.362780e-02	5.415998e-03	2.773232e-02
## 6-290957	-6.458297e-03	-9.651090e-02	1.387402e-02	5.252758e-02
## 6-291033	2.169833e-02	1.075731e-02	5.904129e-03	-7.079945e-02
## 6-291071	4.126251e-02	4.426929e-03	-7.092174e-04	6.175704e-03
## 6-291169	3.606030e-01	7.972211e-02	-3.633045e-02	1.591376e-01
## 6-291269	7.680715e-02	2.737564e-02	-9.489141e-03	5.679329e-02
## 6-291324	7.210655e-02	1.892414e-02	-9.717403e-03	4.260303e-02

## 6-291397	3.124204e-02	-7.864244e-03	-4.584711e-03	-1.068130e-02
## 6-291490	8.080483e-03	-5.043809e-02	1.113077e-01	-1.994348e-01
## 6-291525	-1.321654e-02	-2.813781e-03	1.832359e-02	-1.005096e-02
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## 6-291620	3.027528e-02	-7.572895e-03	-5.184895e-03	-8.311358e-03
## 6-291693	-6.809630e-03	-1.988909e-04	-3.695525e-02	-2.845271e-03
## 6-291695	-2.376675e-02	1.584544e-02	3.645974e-02	2.080389e-02
## 6-291710	1.270499e-02	6.642529e-03	4.378850e-03	-3.595133e-02
## 6-291714	-3.723394e-02	-1.632782e-02	4.787587e-02	7.645549e-03
## 6-291806	-7.587637e-03	2.307016e-02	2.904666e-02	-4.356689e-03
## 6-291812	-1.466882e-02	-9.422428e-03	1.071310e-02	9.129338e-04
## 6-291946	-1.396086e-02	-1.501610e-02	1.719870e-02	5.631798e-04
## 6-291986	8.328505e-03	1.280286e-02	-1.191354e-03	-2.286617e-02
## 6-292001	-2.622615e-02	-3.443286e-02	-1.959821e-02	2.132049e-02
## 6-292011	-3.282379e-01	1.240718e-01	-2.416037e-02	-1.974620e-01
## 6-292028	2.208025e-02	-1.138612e-02	-2.597625e-03	-8.182443e-02
## 6-292029	2.010645e-02	1.265997e-02	6.146571e-03	-5.941282e-02
## 6-292041	-6.627429e-03	-4.026988e-03	2.763670e-02	9.393240e-03
## 6-292081	-9.918919e-03	6.275236e-03	1.551112e-02	1.364162e-02
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## 6-292147	-1.592230e-02	-9.171190e-03	1.100990e-02	2.338774e-03
## 6-292162	-1.719600e-02	-9.039870e-03	-5.067373e-02	-7.233284e-03
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## 6-292204	4.385814e-02	1.196337e-02	-4.852047e-03	2.920481e-02
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## 6-292396	1.359679e-02	-1.810748e-02	4.339250e-04	-4.104854e-02
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## 6-292398	6.309925e-02	1.718325e-01	-2.749617e-02	-4.910988e-02
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## 6-297970     -2.393782e-03  7.652944e-04  2.074469e-02 -2.079341e-03
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## 7-301325	3.484213e-02	-2.742012e-02	-3.864182e-03	-8.172652e-02
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## 7-302442	-2.286997e-02	7.760546e-03	1.147095e-02	2.162942e-02
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## 7-304348 -1.228889e-02 3.867445e-02 -4.062091e-02 -7.780280e-03
## 7-304371 -1.755516e-02 2.809144e-02 6.054094e-04 3.259670e-03
## 7-304395 1.324509e-02 1.599006e-02 -9.730729e-04 -2.866638e-02
## 7-304415 -1.793496e-02 -1.068266e-02 6.724462e-03 -6.154900e-03
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## 7-304566 2.277028e-02 -7.975629e-03 -2.406790e-02 -4.450151e-04
## 7-304604 1.045214e-02 1.126122e-02 -6.545502e-04 -2.069765e-02
## 7-304611 4.574743e-02 1.334390e-02 -4.353297e-03 2.483806e-02
## 7-304720 -2.469291e-03 3.501403e-03 -2.918308e-02 -6.157175e-04
## 7-304880 -1.956501e-02 8.981819e-03 -3.467322e-04 1.332184e-02
## 7-304881 7.645824e-02 1.198966e-02 -1.029688e-02 3.323216e-02
## 7-304884 -1.076432e-02 1.300724e-02 2.725747e-02 1.056427e-02
## 7-304920 -4.753453e-03 8.435667e-03 -3.475387e-02 -1.032409e-03
## 7-304935 -2.252360e-02 5.823751e-03 -3.184034e-02 1.035610e-02
## 7-305008 -1.602925e-02 -9.699818e-03 6.310084e-03 -3.729970e-03
## 7-305067 4.234169e-02 1.567347e-02 -6.214502e-03 3.213392e-02
## 7-305106 5.052501e-03 -2.140112e-02 -2.244717e-02 -1.254945e-02
## 7-305110 -1.229426e-02 -5.225562e-02 5.368868e-03 3.365538e-02
## 7-305134 3.847298e-02 3.677360e-03 2.223269e-03 -1.723037e-02
## 7-305196 -1.082548e-02 1.516980e-02 2.585057e-02 6.440379e-03
## 7-305265 -3.909462e-03 -6.912243e-02 1.042242e-02 3.681704e-02
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## 7-305336 -2.647143e-02 -3.801697e-02 -2.123745e-02 1.906942e-02
## 7-305348 -9.528753e-03 1.462460e-02 2.417043e-02 9.462426e-03
## 7-305410 -1.925316e-02 3.161180e-02 -5.649836e-03 2.195681e-03
## 7-305449 3.282081e-02 2.290816e-03 2.499539e-03 -1.573668e-02
## 7-305516 -1.918719e-02 4.839131e-02 6.156304e-02 -4.188276e-03
## 7-305574 2.879274e-02 -1.029038e-02 3.550271e-03 -4.269532e-02
## 7-305599 -1.772870e-02 -6.532655e-03 6.937863e-03 2.373004e-03
## 7-305617 3.282081e-02 2.290816e-03 2.499539e-03 -1.573668e-02
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## 7-305956 1.422902e-02 3.711329e-03 7.075644e-03 -4.004192e-02
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## 7-306467 2.081656e-02 2.626776e-03 7.423186e-03 -4.290804e-02
## 7-306514 -3.245062e-02 3.283204e-02 -8.208079e-02 -3.744442e-03
## 7-306558 -2.054126e-02 4.620753e-02 2.875629e-02 7.157463e-04

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## 7-306766 -5.881336e-02 -1.950059e-02 -1.090045e-01 -1.266254e-02
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## 7-306821 -1.069571e-02 1.983695e-02 3.664096e-02 -1.952885e-04
## 7-306826 -1.067209e-01 -5.462191e-02 -1.074210e-01 -1.851282e-02
## 7-306894 -3.937037e-03 -1.094804e-02 2.152687e-02 3.615884e-03
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## 7-306959 -1.121061e-02 2.023152e-02 3.715739e-02 4.090442e-04
## 7-306978 -2.052660e-02 -5.329742e-03 -6.642592e-02 -6.833029e-03
## 7-307119 -3.490032e-04 -2.900589e-02 2.796500e-02 -5.908085e-03
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## 7-307209 -1.002353e-02 5.105519e-03 -5.218959e-02 -6.955167e-03
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## 7-307560 4.515872e-02 1.177673e-02 7.230438e-03 -6.225933e-02
## 7-307570 -8.948689e-04 2.706911e-02 5.366108e-03 -1.807306e-02
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## 7-307746 -2.192048e-02 -2.018056e-04 2.394292e-02 1.504526e-02
## 7-307775 1.909169e-02 2.322397e-03 1.705034e-03 -2.634997e-02
## 7-307775_2 -1.826732e-02 -5.106592e-02 -2.502841e-03 2.791616e-02
## 7-307781 -1.080818e-02 -1.461836e-02 2.812528e-02 9.206731e-03
## 7-307785 -1.080818e-02 -1.461836e-02 2.812528e-02 9.206731e-03
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## 7-307981 6.472465e-02 2.186383e-01 -2.550584e-02 -7.648757e-02
## 7-307991 -1.091432e-02 4.114980e-02 4.009019e-02 -7.615712e-03
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## 7-308120 -4.453339e-02 1.200605e-02 -1.484022e-01 -2.380858e-02
## 7-308124 -2.267293e-02 4.453013e-02 -1.814064e-02 -6.389348e-03
## 7-308240 -7.661587e-02 1.852166e-01 1.489716e-01 9.651697e-03
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## 7-308418 -7.006814e-03 -8.607891e-04 -2.926370e-02 -1.682971e-03
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## 7-308513 -1.490484e-02 2.237307e-02 2.705676e-02 1.421904e-02
## 7-308524 -1.848103e-02 4.357227e-03 8.468250e-03 1.568015e-02
## 7-308546 -1.593424e-02 4.379977e-02 -4.075677e-02 -8.134723e-03
## 7-308549 -1.879135e-02 -2.887679e-02 4.174022e-02 9.099513e-03
## 7-308569 -3.558124e-02 -1.745236e-02 -8.501242e-02 -1.842348e-02
## 7-308680 1.737545e-02 -2.735467e-02 2.050931e-03 -5.502379e-02

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## 7-308893 -1.088010e-02 1.337510e-02 -3.249081e-02 -7.736782e-03
## 7-308923 -2.054126e-02 4.620753e-02 2.875629e-02 7.157463e-04
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## 7-309568 -1.027157e-03 -2.298622e-02 -4.964740e-02 -1.264328e-02
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## 7-309610 -1.654141e-02 -1.428771e-02 1.851253e-02 7.332725e-03
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## 7-309742 -1.831198e-02 -4.150825e-02 -9.531135e-03 1.389231e-02
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## 7-309933 -2.982123e-02 -1.322748e-02 8.551891e-03 -3.821512e-03
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## 7-310024 -2.186767e-02 2.665316e-02 -3.467547e-02 -1.346125e-03
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## 7-310065 9.831197e-02 2.392949e-02 -1.955270e-02 4.881252e-02
## 7-310077 3.514314e-02 -2.202451e-03 1.548832e-02 -6.544339e-02
## 7-310102 4.078113e-02 1.011366e-02 -4.915659e-03 2.357904e-02
## 7-310108 -2.036561e-02 2.477262e-02 -4.481544e-02 -1.985272e-03
## 7-310118 -4.318478e-03 2.215509e-03 1.817549e-02 7.861998e-03
## 7-310148 -2.865298e-02 -1.326688e-02 8.623814e-03 -4.642029e-03
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## 7-310233 -8.027635e-03 2.241119e-02 2.556691e-02 5.688477e-04
## 7-310274 7.622431e-02 2.096106e-02 -1.163993e-02 5.495991e-02
## 7-310280 -1.376519e-02 -4.108659e-02 1.005298e-03 2.799781e-02
## 7-310345 4.479639e-02 1.888411e-02 -6.800344e-03 3.826569e-02
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## 7-310380 -2.583142e-02 5.089109e-02 -1.559078e-02 -5.532481e-03
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## 7-310536     -1.787089e-02 -7.188441e-03  5.674274e-03  1.196221e-03
## 7-310611      3.777358e-01  1.024584e-01 -5.623477e-02  2.238864e-01
## 7-310615      9.606371e-04 -2.221881e-02 -3.512281e-02 -1.131103e-02
## 7-310690      5.952931e-02  2.066156e-02 -1.468407e-02  3.181906e-02
## 7-310765      4.882983e-02  1.143095e-02 -5.871817e-03  2.534690e-02
## 7-310771     -5.489479e-03 -7.988897e-04  6.958707e-04 -1.100545e-02
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## 7-310827     -5.040368e-03 -2.028788e-02 -2.493648e-03  3.123769e-03
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## 7-310904      4.171671e-02 -8.458450e-04  6.575388e-03 -5.310656e-02
## 7-310936      1.934634e-01  5.054338e-02 -3.199838e-02  1.082359e-01
## 7-310940      2.389602e-01  6.918981e-02 -3.846884e-02  1.461811e-01
## 7-311107     -1.389022e-02  3.716896e-02 -3.996663e-02 -8.872540e-03
## 7-311338     -2.257879e-02 -7.996409e-03 -5.995224e-02 -1.004042e-02
## 7-311353      3.652845e-02  2.455943e-05  6.496811e-03 -5.124754e-02
## 7-311374     -2.257879e-02 -7.996409e-03 -5.995224e-02 -1.004042e-02
## 7-311380     -7.293680e-03 -7.759303e-03 -4.108852e-02 -1.682151e-03
## 7-311501     -1.809922e-02  1.008427e-02  3.195724e-02  1.903478e-02
## 7-311523     -1.445567e-02  3.827156e-02 -3.790250e-02 -8.132001e-03
## 7-311546     -5.150126e-03  6.054719e-03  2.365942e-02  2.071906e-03
## 7-311610      3.135871e-02  1.887454e-02  2.848853e-03 -3.814927e-02
## 7-311615     -3.391376e-05 -1.696856e-02  3.784188e-02 -3.419626e-03
## 7-311668     -8.813795e-03 -1.304142e-02  2.690794e-02  8.402115e-03
## 7-311745      6.192035e-02 -1.300993e-02  7.576211e-03 -1.133872e-01
## 7-311758      2.278558e-01  5.873271e-02 -3.033444e-02  1.446567e-01
## 7-311804      7.661418e-03  1.579624e-02  2.057493e-03 -2.114972e-02
## 7-311843      5.550119e-02  2.291812e-02 -7.763442e-03  4.791139e-02
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## 7-312075     -2.271062e-02 -7.632398e-03  1.763187e-02  1.968126e-02
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## 7-312104     -2.271062e-02 -7.632398e-03  1.763187e-02  1.968126e-02
## 7-312114     -8.356072e-05 -1.589968e-02  3.670952e-02 -3.291336e-03
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## 7-312920     -1.527444e-02  1.029888e-02 -4.241119e-02 -4.291395e-03
## 7-312939      6.212333e-02  1.601720e-02 -5.287207e-03  3.012084e-02
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## 7-313180 -1.105201e-02 -1.828579e-02 2.300873e-02 3.296466e-03
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## 7-313369 -5.594805e-03 -1.846926e-03 -1.071287e-03 -1.878800e-02
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## 7-320162 -3.463042e-03 -1.176712e-03 2.831875e-02 6.616741e-03
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## 7-320740 2.273475e-02 3.392268e-03 1.940156e-03 -1.571159e-02
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## 7-320885 -4.282521e-03 -7.883381e-03 2.856290e-02 -1.605511e-02
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## 7-320919 -1.191162e-01 -3.288320e-01 2.959157e-02 8.322466e-02
## 7-320954 -1.293063e-02 2.064214e-02 -2.257478e-02 -6.154676e-03
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## 7-321096 -8.320531e-03 1.518318e-02 2.256306e-02 6.724742e-03
## 7-321109 -3.811925e-02 -1.402535e-02 8.157701e-03 -2.394647e-03
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## 7-321369 1.386574e-01 2.871368e-02 -1.769378e-02 7.096421e-02
## 7-321391 -1.951310e-02 -6.082496e-03 3.798407e-03 -5.076767e-03
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## 7-324492     -1.700072e-02 -2.619124e-02  3.417073e-02  6.639833e-03
## 7-324552     -1.091827e-02 -2.444588e-02 -5.738680e-03  1.145090e-02
## 7-324557     -1.797923e-03  4.974934e-03 -2.889289e-02 -3.688674e-03
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## 7-325157 3.618902e-02 5.745813e-03 -1.614000e-03 1.438268e-02
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## 7-327138 3.132213e-02 -1.203463e-02 -4.564479e-03 -1.167669e-02
## 7-327186 -1.934645e-02 -6.262712e-03 -1.775874e-04 6.034998e-03
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## 7-327329 -5.756348e-03 -5.491292e-02 5.929639e-02 -2.665751e-02
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## 7-327372 -5.467023e-03 1.711377e-02 1.553876e-02 -1.437512e-04
## 7-327381 -1.053888e-02 -5.617493e-03 -8.673478e-02 -5.647553e-03
## 7-327439 -1.578689e-02 -7.569494e-03 3.626595e-03 -6.352571e-03
## 7-327499 2.106208e-02 -7.059713e-03 3.764374e-03 -2.011282e-02
## 7-327522 -1.285432e-02 8.819398e-03 1.111460e-02 1.262345e-02
## 7-327557 2.173125e-02 8.532089e-03 4.237225e-03 -3.918423e-02
## 7-327565 2.173125e-02 8.532089e-03 4.237225e-03 -3.918423e-02
## 7-327588 2.776021e-02 3.017662e-02 2.201798e-02 -5.069867e-02
## 7-327616 5.323779e-02 2.417567e-02 -1.102611e-02 4.408116e-02
## 7-327639 -1.109633e-02 3.680822e-03 2.875894e-02 -2.194050e-03
## 7-327661 -7.930474e-03 -4.316351e-02 1.819923e-04 6.587280e-03
## 7-327698 -1.713190e-02 -3.664997e-02 -1.368824e-02 1.259566e-02
## 7-327705 -1.220574e-02 -1.348067e-02 2.202748e-02 -2.163836e-02
## 7-327711 -5.275361e-03 6.091042e-03 -2.878833e-02 -6.781214e-04
## 7-327730 -1.784611e-02 -4.050624e-03 -1.917330e-04 7.305767e-03
## 7-327731 -6.736389e-03 -2.376212e-02 3.411835e-02 -5.546358e-03
## 7-327764 -2.525239e-02 -1.208639e-02 2.388754e-02 1.545887e-02
## 7-327841 -1.996341e-03 -4.910091e-02 4.298538e-04 -6.814176e-03
## 7-327842 -8.114272e-03 3.474727e-02 1.901473e-02 -1.580566e-02
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## 7-328043 -7.747734e-03 9.915337e-03 -5.734883e-02 -3.833287e-03
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## 7-328229 -4.695736e-02 1.063005e-01 5.792583e-02 1.134593e-02
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## 7-328929 -5.341333e-03 -1.651372e-02 2.265724e-02 6.756788e-04
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## 7-328975 -2.226656e-02 -1.100840e-03 2.616932e-02 8.659977e-03
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## 7-329015 -8.750896e-03 2.718552e-02 2.735539e-02 -1.251212e-03

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## 7-329035_2   -1.363080e-02 -9.758656e-03 -3.559577e-02 -8.051244e-03
## 7-329042     5.689172e-02  1.551004e-02 -8.711467e-03  3.717723e-02
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## 7-329182     -1.577311e-02 -4.958131e-02  5.561472e-02 -1.524424e-02
## 7-329188     -3.861713e-03 -4.073300e-02 -9.032227e-02 -3.192041e-02
## 7-329203      2.078607e-03  2.311594e-02 -2.207466e-03 -2.493263e-02
## 7-329230     -8.645758e-03 -1.416875e-02  1.642436e-02  1.516465e-03
## 7-329303     -1.044661e-02  5.205124e-03  2.819382e-02  7.555053e-03
## 7-329306     -6.351562e-04 -5.674011e-03  1.738595e-03 -1.799036e-02
## 7-329313     -2.414864e-02  2.027897e-03  2.444102e-02  2.265146e-02
## 7-329332      3.783236e-04 -2.292129e-03 -5.013920e-02 -2.301241e-03
## 7-329455     -1.804573e-02 -9.108167e-03 -3.573876e-02 -3.691822e-03
## 7-329456      5.836412e-02  1.054615e-02 -3.157179e-03  5.938144e-03
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## 7-329547     -8.874973e-03 -3.155005e-02  3.391717e-02 -1.122561e-02
## 7-329592     -2.135316e-02  4.753255e-02  2.250303e-02  8.814363e-03
## 7-329613      3.005359e-02  6.634395e-03  2.963692e-03 -4.028579e-02
## 7-329614     -2.465610e-02 -1.489606e-02 -5.415663e-02 -9.705169e-03
## 7-329701     -2.777175e-02 -7.280450e-03 -6.616034e-02  5.495130e-03
## 7-329724     -8.300202e-03  2.490911e-02  2.317393e-02 -5.367678e-04
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## 7-329842     -8.934351e-03 -3.213710e-02  3.412354e-02 -1.194112e-02
## 7-329887      6.484862e-03  3.974650e-02  6.472947e-03 -4.018280e-02
## 7-329925     -2.388598e-03  1.959237e-03 -2.834081e-02 -9.763769e-04
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## 7-329976     -1.105031e-02  2.038985e-02  2.943154e-02  5.509831e-03
## 7-329996     -3.449362e-02  3.813509e-02  1.149127e-01  2.871204e-02
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## 7-330125      2.223997e-02 -9.697552e-03 -4.816339e-03 -7.741049e-03
## 7-330126     -4.536775e-03 -3.965341e-02  2.188792e-03  2.786822e-03
## 7-330152     -5.810627e-03 -1.251047e-01 -2.764651e-03  3.381183e-02
## 7-330174     -1.105031e-02  2.038985e-02  2.943154e-02  5.509831e-03
## 7-330179      8.080882e-02  2.826634e-02 -1.173636e-02  6.009993e-02
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## 7-330287      7.474387e-02 -2.194323e-03 -7.480992e-03 -8.924423e-03
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## 7-330610     -6.146205e-02  1.042181e-01  1.898016e-01  3.207587e-02
## 7-330709     -1.058784e-02 -1.220727e-03  5.499075e-03  7.419906e-03
## 7-330779      1.661886e-02  5.083180e-03  3.871276e-03 -2.646897e-02
## 7-330788      6.270772e-05 -7.487613e-03  2.360754e-03 -2.234825e-02
## 7-330863     -1.392194e-02  9.417031e-03  7.941344e-03  1.088006e-02
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## 7-331232 -7.753480e-03 1.686293e-02 3.642791e-02 -1.319317e-03
## 7-331254 -2.350123e-02 4.958487e-02 -4.022669e-02 -1.248267e-02
## 7-331307 -1.492128e-01 -2.202702e-01 -2.580987e-02 -8.309491e-03
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## 7-331367 -2.118138e-02 1.710453e-02 3.505140e-03 1.191259e-02
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## 7-331454 3.771514e-02 6.177835e-03 2.186621e-03 -3.326818e-02
## 7-331456 -1.399715e-02 -6.234261e-02 4.182834e-03 3.865428e-02
## 7-331540 1.229928e-01 -1.659182e-02 -6.188592e-03 -5.838421e-02
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## 7-331654 -1.156484e-02 -1.410746e-02 1.407979e-02 1.447150e-03
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## 7-331747 5.772519e-02 1.103230e-02 1.495292e-03 -4.570997e-02
## 7-331757 -9.568521e-03 -2.886739e-02 2.582795e-02 -9.479740e-03
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## 7-331967 4.829854e-02 4.987202e-03 1.127732e-02 -3.157692e-02
## 7-332025 -2.309705e-02 4.900399e-02 -3.887796e-02 -1.259996e-02
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## 7-332947 -7.565666e-03 -1.632059e-02 1.576419e-02 -5.117828e-03
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## 7-333558 -1.873444e-02 3.359347e-02 6.671564e-02 1.481724e-03
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## 7-333814 -3.631258e-02 -6.758238e-03 3.209557e-02 3.134484e-02
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## 7-334021 -3.722519e-02 -7.188634e-03 3.141814e-02 3.042405e-02
## 7-334040 -2.506662e-03 -5.727597e-03 2.609092e-03 -2.626276e-02
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## 7-334157 -5.208370e-03 5.366697e-03 -2.582618e-02 -1.371619e-04
## 7-334215 -5.970228e-03 -2.392487e-02 2.115468e-02 -6.385923e-03
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## 7-335003 -1.864561e-02 2.362816e-03 -2.421358e-03 1.228228e-02
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## 7-335013 6.211917e-02 2.940386e-02 -1.160991e-02 5.527647e-02
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## 7-335939	4.505612e-02	1.781403e-02	2.179534e-03	1.809543e-02
## 7-335983	-2.212352e-02	3.352275e-02	-6.689816e-02	-1.149252e-02
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## 7-336239	-6.212670e-03	-6.642644e-02	1.020900e-02	3.604675e-02
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## 7-337586	-3.143116e-02	-7.481765e-03	3.294971e-02	2.624157e-02
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## 7-338138	6.838734e-02	2.138682e-02	5.813863e-03	-5.891133e-02
## 7-338172	-1.260607e-02	2.315286e-02	-2.714765e-02	-7.623944e-03
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## 7-345349	4.170868e-03	9.499699e-03	5.183598e-03	-1.122869e-02
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## 7-346362	-1.338149e-02	1.190049e-03	5.894455e-03	1.062404e-02
## 7-346541	-2.202395e-02	1.449788e-02	1.199535e-02	2.059342e-02
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## 8-350350      -1.939157e-02 -4.577496e-03 -4.792176e-02 -5.274508e-03
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## 8-350540      -1.292666e-02  8.997966e-03 -3.184603e-02 -4.555266e-03
## 8-350590      2.617982e-02  6.486442e-03  1.869630e-03 -2.945831e-02
## 8-350793      -7.913773e-03 -1.258702e-02  3.062922e-02 -3.612868e-02
## 8-350802      -1.292666e-02  8.997966e-03 -3.184603e-02 -4.555266e-03
## 8-350845      -1.560402e-02  3.622654e-02 -3.023995e-02 -5.724556e-03
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## 8-351396      5.242151e-02  1.161407e-02 -6.820978e-03  2.589394e-02
## 8-351421      -2.144345e-02 -5.435242e-02  1.190069e-01 -6.373697e-02
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## 8-351550      -2.848330e-02  2.892609e-02  2.837702e-02  1.707937e-02
## 8-351696      -8.289505e-03 -1.459989e-02  2.623060e-02 -2.092047e-02
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## 8-351811 -8.289505e-03 -1.459989e-02 2.623060e-02 -2.092047e-02
## 8-351875 -3.868840e-02 9.021386e-02 4.561153e-02 1.898182e-03
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## 8-351995 5.867058e-03 5.637286e-04 -3.499848e-02 -1.092359e-02
## 8-352025 2.702430e-02 -3.274798e-03 2.447669e-03 -4.262196e-02
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## 8-352315 6.233008e-02 4.328234e-03 -8.988248e-03 2.491305e-02
## 8-352396 -3.649038e-02 -1.677760e-02 -7.771585e-02 -8.975435e-03
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## 8-352471 1.874017e-03 -2.937462e-03 -5.273407e-02 -7.989411e-03
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## 8-352529 -9.153222e-03 -2.609175e-02 -3.090346e-03 8.145724e-03
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## 8-354004 -8.379960e-03 2.536938e-02 2.942668e-02 -2.127582e-03
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## 8-355207 -1.952695e-02 -8.952344e-03 1.047672e-02 7.753555e-03
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## 8-355449 -1.265791e-02 8.357389e-03 -3.244723e-02 -5.741024e-03
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## 8-355734 -2.109262e-02 -1.429056e-02 1.828768e-02 1.278038e-02
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## 8-355741 -2.234922e-02 -2.555966e-03 1.195236e-02 9.687623e-04
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## 8-356253 -3.753377e-02 -1.667513e-02 -5.658623e-02 3.378747e-03
## 8-356331 -7.900109e-03 -4.063317e-02 7.729364e-03 2.387327e-02
## 8-356367 2.239004e-02 5.364229e-03 1.485154e-03 -2.198601e-02
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## 8-356408 -6.041508e-03 -2.535852e-02 2.896056e-02 -1.607287e-02
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## 8-356563 -2.459769e-02 -1.013748e-02 -3.392873e-02 8.771287e-04
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## 8-356952     -4.994884e-03  1.109131e-02 -2.510855e-02 -1.338283e-03
## 8-356955      7.248434e-03  -5.537929e-03 -1.194301e-03 -2.962695e-02
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## 8-357104     -8.107432e-02  -2.178257e-02  5.934933e-02  3.669900e-02
## 8-357129     -1.458266e-02   1.939569e-02  2.036128e-02  6.965887e-03
## 8-357181     -1.575187e-01   2.685025e-01 -8.930107e-02  2.282776e-03
## 8-357205    -4.003354e-03  -2.680803e-02 -3.886271e-03  1.805160e-03
## 8-357266      1.202023e-02  -2.088825e-02 -2.540308e-02 -9.756549e-03
## 8-357275     -1.820845e-02   4.087539e-02  2.420569e-02 -4.753712e-04
## 8-357319     -9.343497e-03   1.203171e-02  2.429217e-02  1.291677e-02
## 8-357334    -3.477599e-03  -2.537602e-02 -3.660660e-03  1.132342e-03
## 8-357338      1.232647e-01   6.099467e-03 -2.040156e-02  3.543263e-02
## 8-357403     -1.820845e-02   4.087539e-02  2.420569e-02 -4.753712e-04
## 8-357481     -5.343220e-03   1.170488e-02  1.935737e-02 -8.048467e-04
## 8-357506     -4.871827e-03  -8.016837e-03 -4.730078e-02 -2.718973e-03
## 8-357536     -1.907041e-02  -3.959957e-02 -9.522265e-03  1.310453e-02
## 8-357574     -2.155294e-02   5.449976e-02  3.676022e-02  3.736523e-03
## 8-357592      1.614943e-02   7.630566e-03  3.593352e-03 -3.893096e-02
## 8-357603     -7.212151e-03   1.871797e-02  2.192118e-02 -2.608743e-03
## 8-357658     -1.564010e-02  -2.574595e-02  2.145504e-02 -1.716736e-03
## 8-357682      1.614943e-02   7.630566e-03  3.593352e-03 -3.893096e-02
## 8-357848     -1.332001e-02  -1.333076e-02 -3.497001e-02 -1.366816e-02
## 8-357876     -6.976205e-03  -2.023210e-02  2.934875e-02 -1.310552e-02
## 8-357886     -2.972086e-02  -5.474439e-02 -1.716746e-02  1.805466e-02
## 8-357932      1.938728e-02  -6.069861e-03  9.152783e-04 -2.151723e-02
## 8-357951      1.037991e-02  -2.559175e-02 -3.874251e-02 -1.072654e-02
## 8-357970      3.330092e-02   1.349793e-02 -3.515661e-02 -1.146261e-02
## 8-357977     -1.804813e-03   5.562996e-02  2.208224e-02 -3.595142e-02
## 8-358046      1.703539e-02  -1.753955e-02  1.453058e-03 -3.735421e-02
## 8-358047      8.235940e-02   2.406666e-02 -1.197368e-02  5.150347e-02
## 8-358083     -1.492727e-02  -2.147528e-02  1.854827e-02 -1.148838e-03
## 8-358085      8.633527e-03  -4.307308e-03 -1.226635e-03 -2.803142e-02
## 8-358087     -8.228521e-03  -3.362498e-03 -2.935345e-02 -1.001908e-03
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## 8-358222     -2.433376e-02  -2.511509e-03  1.420256e-02  2.381646e-03
## 8-358227      1.128769e-02   2.108188e-02  2.648355e-02 -1.038655e-02
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## 8-358304_2   -4.023979e-02  -1.497778e-02 -5.435219e-02  5.689123e-03
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## 8-358929	-5.053463e-03	9.254769e-03	1.459850e-02	7.710161e-04
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## 8-358983	-3.174800e-02	-1.304804e-02	2.159485e-02	1.570896e-02
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## 8-359143	-1.890739e-02	-1.184971e-04	1.653069e-02	1.402202e-02
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## 8-359258	7.559041e-02	2.200410e-02	-1.064054e-02	4.602492e-02
## 8-359266	3.639437e-02	5.083917e-03	-4.975106e-03	1.932052e-02
## 8-359294	-8.355520e-03	1.498458e-02	-2.540108e-02	-7.784767e-04
## 8-359318	-3.735295e-02	-3.874199e-02	3.764083e-02	1.436069e-02
## 8-359325	2.478975e-01	3.938359e-01	-1.370060e-01	-1.084414e-01
## 8-359339	-3.516794e-02	-3.919556e-02	3.785898e-02	1.231371e-02
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## 8-359472	2.550570e-01	3.982614e-01	-1.205497e-01	-9.346940e-02
## 8-359489	-1.590758e-03	-1.423945e-02	2.332956e-02	-5.893594e-03
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## 8-359613	1.629499e-02	8.511666e-03	3.326985e-03	-3.746635e-02
## 8-359641	1.928690e-01	4.578878e-02	-2.549621e-02	1.102977e-01
## 8-359669	3.633452e-02	-1.408441e-02	2.252117e-03	-6.610484e-02
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## 8-360310	3.324546e-04	-2.712721e-03	-2.737436e-02	8.942425e-05
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## 8-360423      1.989093e-01  4.819948e-02 -2.066859e-02  1.069361e-01
## 8-360481     -1.760448e-02  2.247134e-02  5.150830e-02  1.667691e-02
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## 8-360531     -1.681252e-02  1.351164e-02 -7.986583e-02 -6.461849e-03
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## 8-360864     -1.640508e-02 -6.833928e-03 -4.150457e-02 -6.372726e-03
## 8-360929      3.685147e-02  8.031932e-03 -4.290111e-03  1.845631e-02
## 8-360932      2.499392e-02  3.634956e-02 -6.878602e-03 -6.039129e-02
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## 8-361037     -4.056147e-02 -5.195343e-02 -2.508928e-02 -3.448471e-03
## 8-361141      4.921218e-04  9.231545e-03  2.120678e-02 -1.370837e-02
## 8-361185     -9.215227e-03  6.269968e-03 -6.529801e-02 -3.305094e-03
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## 8-361240     -1.720998e-01  2.297728e-01  4.238164e-02 -9.755696e-02
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## 8-361437      4.405543e-02  4.315791e-03 -6.549426e-03  2.113580e-02
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## 8-363550    1.408050e-01  5.326238e-02 -5.741063e-02 -4.084641e-03
## 8-363552   -2.651243e-02 -6.175624e-03  2.059930e-02 -7.002242e-03
## 8-363552_2   1.050375e-01  2.600355e-02 -1.752120e-02  6.040570e-02
## 8-363594   -1.739730e-02 -8.485198e-04  7.463090e-03 -1.595841e-02
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## 8-363752    5.764529e-04 -1.084661e-02  2.159955e-02 -1.287240e-03
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## 8-364550 -1.800188e-02 2.148043e-02 1.080256e-02 1.175156e-02
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## 8-366632	2.062035e-02	6.457610e-03	1.231256e-03	-3.206540e-02
## 8-366716	1.433781e-01	2.156747e-02	-8.990440e-02	3.587476e-02
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## 8-366852	3.333843e-02	-2.091172e-02	1.550947e-03	-5.409796e-02
## 8-366888	-6.483876e-03	-8.454958e-03	2.201816e-02	-2.595026e-02
## 8-366901	-2.731769e-02	3.416785e-02	2.198808e-02	1.963020e-02
## 8-366949	1.176652e-01	1.273075e-02	-9.863597e-03	1.786356e-02
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## 8-366958	2.276055e-03	8.545568e-03	3.710011e-02	-2.757808e-02
## 8-366979	1.519168e-03	7.434833e-03	3.933316e-02	-2.697674e-02
## 8-367091	-4.793286e-02	-2.076194e-01	-7.458107e-03	7.973557e-02
## 8-367118	3.528167e-03	8.129058e-03	3.717027e-02	-3.278619e-02
## 8-367127	-2.179015e-02	1.370345e-02	1.848843e-02	1.636064e-02
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## 8-367217	-2.339836e-02	-7.268024e-03	-2.713144e-03	-3.749260e-03
## 8-367359	-6.201077e-04	-2.393122e-03	-4.070626e-02	-1.078723e-03
## 8-367470	7.066424e-03	-8.582546e-03	-3.457375e-03	-3.135172e-02
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## 8-368033	-7.942239e-03	8.747015e-04	-3.893677e-02	1.828647e-04
## 8-368042	-1.730335e-02	-2.220957e-02	3.319884e-02	4.852070e-03
## 8-368078	-9.361471e-03	1.989912e-02	3.186347e-02	-4.681314e-03
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## 8-368532	1.677228e-02	-8.424394e-02	-3.023640e-02	-5.937073e-02
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## 8-368750 4.087424e-02 9.457888e-03 -5.255144e-03 1.630274e-04
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## 8-368919_2 -2.714924e-02 -8.143771e-03 -2.628515e-03 1.716948e-02
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## 8-379141	-1.571683e-02	-6.663352e-03	2.183923e-03	-6.164971e-03
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## 8-379244	-1.962052e-02	1.010656e-02	-5.780634e-02	-8.127485e-03
## 8-379515	-1.268770e-02	-1.755456e-02	1.696655e-02	-3.426579e-03

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## 8-379516 -4.938194e-03 1.232677e-02 2.451846e-02 -3.048170e-03
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## 8-379695 1.337551e-02 -1.265061e-02 -1.197173e-03 -3.573644e-02
## 8-379698 4.170639e-01 -2.270367e-01 6.690464e-02 -8.271557e-03
## 8-379704 7.473912e-03 8.594182e-03 9.468340e-03 -3.176690e-02
## 8-379713 -2.338388e-03 -5.570015e-03 3.620445e-02 -9.075980e-03
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## 8-379826 -9.484078e-04 -2.009358e-02 3.308966e-02 -5.701934e-03
## 8-379838 -2.458729e-02 8.062341e-03 2.227599e-02 2.292122e-02
## 8-379910 -1.744580e-02 3.835994e-03 -1.080940e-04 1.130995e-02
## 8-379947 4.222045e-02 1.736158e-02 -5.116159e-03 2.744069e-02
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## 8-381239 1.137572e-02 2.914807e-02 -5.589839e-03 -3.982198e-02
## 8-381277 -1.408082e-02 -1.021720e-01 1.234581e-02 5.969051e-02
## 8-381358 -1.676104e-02 2.504439e-02 4.602644e-02 6.932874e-03
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## 8-381924   -5.869730e-02 -1.393278e-02  1.708270e-02  3.234954e-02
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## 8-384219	-2.643401e-02	-9.002976e-03	-6.198804e-02	-8.226700e-03
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## 8-384537	2.295430e-02	-1.883442e-02	4.529357e-03	-9.225564e-02
## 8-384594	-2.619692e-02	5.491701e-02	5.015690e-02	-1.590544e-03
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## 8-384631	-1.720222e-02	-5.471181e-03	-3.913442e-02	-6.229270e-03
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## 8-384886	1.520225e-02	-1.543565e-02	-1.001942e-04	-3.080020e-02
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## 8-385076	-2.253125e-02	-1.528326e-02	-4.342834e-02	2.410579e-03
## 8-385107	-3.321498e-03	-4.139003e-03	4.591200e-03	-2.456164e-02
## 8-385157	-5.975700e-03	-2.570622e-02	-1.495848e-02	-3.203311e-03
## 8-385225	-1.178375e-02	2.379424e-02	3.138862e-02	8.716877e-03
## 8-385469	-6.685746e-02	-5.626255e-02	4.660587e-02	1.155611e-02
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## 8-385810	2.857369e-02	-6.314015e-03	-1.776427e-04	-6.959731e-03
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## 8-386068	-1.098665e-02	5.517592e-03	1.150351e-02	1.231156e-02
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## 8-386714 -1.560213e-02 1.075273e-02 -6.050529e-02 -1.146252e-02
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## 8-394624	-2.320144e-02	-3.540856e-02	5.079255e-02	-1.029342e-02

## 8-394634	-9.309910e-03	-1.112725e-02	1.098384e-02	-2.153646e-02
## 8-394640	2.897965e-02	-6.074563e-03	1.634638e-03	-1.836998e-02
## 8-394645	-1.246637e-02	-7.299136e-02	8.100893e-03	4.203628e-02
## 8-394697	-3.376707e-02	5.812432e-03	-1.126747e-01	-9.457243e-03
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## 9-409990	-2.201587e-02	-7.244154e-03	-5.819164e-02	-8.178605e-03
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## 9-410714	-2.369238e-02	-2.305653e-02	1.995935e-02	4.519508e-03
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## 9-416950	-1.252973e-02	2.785002e-02	-8.693885e-02	-1.196083e-02
## 9-416974	4.948706e-02	1.525470e-02	-1.424877e-02	2.611179e-02
## 9-417003	-3.565545e-02	-1.309119e-01	-4.131799e-02	7.262084e-02
## 9-417240	8.292994e-03	-1.882597e-02	3.403728e-02	-6.615345e-02
## 9-417255	-2.198233e-02	-4.098855e-04	2.384646e-02	1.542882e-02
## 9-417361	-2.192039e-02	-9.438506e-03	1.722126e-02	2.048982e-02
## 9-417365	-2.025530e-02	-3.135463e-02	9.914808e-03	3.545763e-02
## 9-417399	-1.087503e-02	-1.205746e-02	5.279551e-03	-3.683593e-02
## 9-417524	-4.190258e-01	1.911873e-01	-1.906269e-02	-4.042175e-02
## 9-417592	4.172049e-02	-1.907172e-02	-1.593019e-03	-6.431133e-02
## 9-417600	3.784522e-02	1.068297e-03	-6.469995e-04	-6.920406e-04
## 9-417724	1.416642e-02	1.635736e-02	-1.533805e-03	-3.155382e-02
## 9-417743	4.605985e-02	-2.048547e-02	-6.570794e-04	-6.810620e-02
## 9-417765	1.231128e-02	-1.120644e-02	-6.136085e-03	-4.442312e-02
## 9-417790	-2.495419e-02	5.036033e-02	-8.282044e-02	-7.530850e-03
## 9-417798	9.917374e-02	3.855060e-02	-1.622701e-02	7.608670e-02
## 9-417828	-1.274560e-02	-3.267250e-03	2.946862e-03	-1.638510e-02
## 9-417898	-9.779824e-03	9.679078e-03	-5.145393e-02	-8.665184e-03
## 9-417914	-6.248368e-03	-1.679812e-02	3.462683e-02	-2.064065e-02
## 9-417931	-1.438543e-02	-3.385716e-02	-5.880764e-03	1.081345e-02
## 9-418037	-1.704957e-02	-2.505800e-02	-1.169980e-02	9.993048e-03
## 9-418064	5.294904e-02	4.787245e-03	-7.925621e-03	2.602699e-02
## 9-418093	-1.596968e-02	-4.583893e-03	3.700872e-03	-2.164031e-02
## 9-418098	-3.271920e-02	-1.392164e-02	-7.640074e-02	-1.386784e-02
## 9-418099	5.294904e-02	4.787245e-03	-7.925621e-03	2.602699e-02
## 9-418099_2	2.528388e-03	-2.179677e-02	-4.499668e-02	-4.426401e-03
## 9-418119	-2.552697e-02	6.273430e-03	3.751108e-03	1.880286e-02
## 9-418162	-8.932198e-03	-1.911090e-02	3.068760e-02	-2.834318e-02
## 9-418162_2	-2.281048e-02	4.833330e-02	2.549912e-02	3.037534e-03
## 9-418191	-7.711855e-03	-3.821664e-02	3.210837e-02	-5.683283e-03
## 9-418270	-1.121705e-02	1.162622e-02	3.422842e-02	3.283068e-03
## 9-418350	-1.438543e-02	-3.385716e-02	-5.880764e-03	1.081345e-02

## 9-418394	-4.864459e-03	6.694917e-03	2.626899e-02	8.851066e-03
## 9-418438	1.338713e-03	-2.080505e-02	-4.902685e-02	-4.394241e-03
## 9-418566	-4.828129e-03	-1.218684e-02	2.502669e-02	-1.836207e-02
## 9-418584	-3.321961e-02	-1.474939e-02	1.331139e-02	1.176423e-02
## 9-418610	-2.636615e-02	6.119493e-02	7.543361e-03	9.353084e-03
## 9-418613	-1.464026e-02	4.038798e-03	5.640248e-03	1.225401e-02
## 9-418649	4.203574e-03	4.601613e-03	1.210755e-02	-1.740548e-02
## 9-418655	4.230523e-02	-1.272094e-02	-1.661275e-03	-1.694803e-02
## 9-418662	-1.372821e-02	-3.720104e-02	4.650158e-02	-3.485545e-02
## 9-418673	1.859910e-02	8.410370e-03	2.155008e-03	-4.030544e-02
## 9-418715	4.590913e-02	7.129218e-03	-6.251826e-03	2.579280e-02
## 9-418728	9.001905e-02	4.582821e-03	-1.195443e-02	3.463749e-02
## 9-418786	-1.464026e-02	4.038798e-03	5.640248e-03	1.225401e-02
## 9-418786_2	-1.464026e-02	4.038798e-03	5.640248e-03	1.225401e-02
## 9-418792	7.020640e-02	9.088287e-03	-6.243822e-03	2.543814e-02
## 9-418869	-3.271920e-02	-1.392164e-02	-7.640074e-02	-1.386784e-02
## 9-418926	-4.414074e-03	-7.916091e-02	1.299102e-02	3.794877e-02
## 9-418976	-2.382111e-02	4.282073e-03	-1.017950e-01	-7.801958e-03
## 9-419042	-1.438543e-02	-3.385716e-02	-5.880764e-03	1.081345e-02
## 9-419050	-2.066392e-02	-1.166588e-02	1.986068e-02	1.933371e-02
## 9-419106	-8.272473e-03	-1.734907e-02	2.317443e-02	-1.429912e-02
## 9-419148	4.488578e-02	2.259373e-02	-9.463023e-03	4.003685e-02
## 9-419203	-6.576058e-03	-3.110171e-02	2.628655e-02	-6.242957e-03
## 9-419428	-5.439100e-03	-1.399503e-02	2.084240e-02	-1.754881e-02
## 9-419478	5.929217e-02	2.041829e-02	-7.622598e-03	4.497864e-02
## 9-419523	6.623646e-03	4.185154e-03	1.350975e-02	-2.117858e-02
## 9-419564	3.819514e-01	2.284585e-02	1.425875e-01	-4.612563e-02
## 9-419631	7.640428e-02	-6.251034e-03	-1.240666e-02	7.850351e-03
## 9-419661	-4.791095e-03	-2.024746e-02	2.481371e-02	-6.945687e-03
## 9-419693	-2.415677e-02	-8.117625e-03	1.883842e-02	2.595113e-02
## 9-419798	-1.260520e-02	-3.111466e-02	-5.056718e-03	1.097688e-02
## 9-419859	-2.773751e-02	-3.670053e-03	6.709635e-04	1.153179e-02
## 9-419900	2.567431e-02	8.883206e-03	7.439150e-03	-2.457789e-02
## 9-419991	-1.260520e-02	-3.111466e-02	-5.056718e-03	1.097688e-02
## 9-420036	-1.016079e-01	-4.062313e-02	-2.143617e-01	-5.255096e-02
## 9-420106	4.153834e-02	2.179586e-02	-9.051723e-03	3.827031e-02
## 9-420112	-1.918957e-02	-9.034664e-03	1.761886e-02	2.031279e-02
## 9-420142	2.753569e-02	-6.201440e-03	4.841143e-03	-2.450894e-02
## 9-420206	8.954292e-03	1.115575e-02	-1.043969e-03	-2.288004e-02
## 9-420206_2	-1.923561e-02	4.408061e-03	-5.853409e-02	-5.025626e-03
## 9-420264	9.517343e-02	-9.705782e-03	-1.383263e-02	4.473958e-03
## 9-420269	-2.303650e-02	-7.812523e-03	-6.120886e-02	-9.488778e-03
## 9-420312	-3.048062e-02	-1.439885e-02	-7.249943e-02	-1.374062e-02
## 9-420343	-3.387829e-02	9.704355e-02	7.187039e-02	-5.391345e-03
## 9-420357	-5.099349e-02	-1.080565e-02	4.543755e-02	3.741520e-02
## 9-420417	-1.063648e-02	1.970660e-02	2.989749e-02	-1.446147e-03
## 9-420435	8.066989e-02	3.286982e-02	-1.254738e-02	5.341416e-02
## 9-420460	-9.694652e-03	1.266301e-02	3.624324e-02	1.251458e-02
## 9-420524	-4.173133e-03	2.251356e-02	1.981048e-02	-9.323703e-03
## 9-420602	-1.093811e-02	1.681681e-02	2.643082e-02	9.503905e-03
## 9-420627	-1.692764e-02	4.056393e-02	-3.300927e-02	-1.029030e-02
## 9-420645	-2.267897e-02	-7.924170e-03	-5.991743e-02	-9.252300e-03
## 9-420646	3.875201e-02	-1.524733e-03	7.286488e-03	-5.242300e-02
## 9-420650	1.453860e-02	-1.491720e-02	2.558895e-03	-3.117153e-02

## 9-420689	-2.076594e-02	5.349621e-02	3.396462e-02	7.061118e-03
## 9-420703	-2.423395e-02	5.148732e-02	2.755193e-02	3.095245e-03
## 9-420740	4.148679e-02	2.182065e-02	-9.025640e-03	3.817211e-02
## 9-420752	-7.110836e-02	-2.513459e-02	-1.368020e-01	2.158609e-03
## 9-420769	2.941948e-03	-3.544897e-02	4.739076e-02	-1.789022e-02
## 9-420780	2.748705e-02	8.402218e-03	3.353822e-03	-4.352513e-02
## 9-420780_2	4.700557e-02	8.074276e-03	-5.982649e-03	2.754097e-02
## 9-420984	-1.544775e-02	4.064870e-02	-4.516171e-02	-1.046465e-02
## 9-421029	-3.050839e-03	-2.405745e-02	2.829590e-02	-3.232383e-03
## 9-421031	7.767848e-03	-1.926120e-02	3.238099e-02	-2.195784e-02
## 9-421067	-3.308969e-02	8.899549e-02	6.586908e-02	5.258353e-03
## 9-421087	-1.849534e-02	4.859638e-02	-5.433114e-02	-1.201094e-02
## 9-421147	2.384671e-03	-1.449598e-02	-2.955235e-02	-1.137030e-03
## 9-421165	-3.048062e-02	-1.439885e-02	-7.249943e-02	-1.374062e-02
## 9-421167	-1.285332e-02	-1.016617e-02	8.697489e-03	9.131318e-04
## 9-421233	5.641814e-02	9.897053e-03	-6.884494e-03	3.256190e-02
## 9-421247	-1.040089e-02	1.726522e-02	-2.098539e-02	-2.623027e-03
## 9-421281	5.620224e-03	-2.623917e-03	-2.976570e-03	-3.147118e-02
## 9-421285	2.696934e-03	-1.928444e-02	3.623866e-02	-1.855227e-02
## 9-421297	-3.251157e-02	-6.724022e-03	-4.746758e-04	1.920986e-02
## 9-421300	-6.387757e-03	9.213892e-03	2.365024e-02	1.156807e-02
## 9-421301	-1.161353e-02	2.314167e-02	-5.664266e-02	-6.903210e-03
## 9-421357	6.962634e-02	1.995156e-02	-9.400760e-03	4.654070e-02
## 9-421404	1.489696e-01	-2.103113e-03	-1.722728e-02	2.702895e-02
## 9-421420	1.885610e-03	-1.578420e-02	-3.386389e-02	-1.335908e-03
## 9-421466	-2.170830e-02	-6.322228e-03	-5.653602e-02	-8.163286e-03
## 9-421476	-7.193702e-03	9.213237e-03	2.771696e-02	1.279889e-02
## 9-421491	-5.770128e-03	-2.729302e-02	3.230149e-02	-4.867598e-03
## 9-421498	-4.205228e-02	-7.822454e-02	-2.517676e-02	3.104671e-02
## 9-421505	-1.595130e-02	-7.420874e-03	-3.853782e-02	-8.695613e-03
## 9-421515	-2.520390e-02	5.370153e-02	2.864572e-02	3.010583e-03
## 9-421560	-9.802619e-03	-3.273434e-02	5.547907e-03	2.228807e-02
## 9-421563	8.808647e-03	1.475863e-02	-1.461038e-03	-2.546194e-02
## 9-421592	5.865193e-02	1.100886e-02	-8.835250e-03	3.014721e-02
## 9-421600	-8.910962e-03	1.605172e-02	3.089325e-02	8.042622e-03
## 9-421664	-1.791591e-02	3.097184e-02	5.257699e-02	5.324804e-04
## 9-421692	3.149641e-02	1.196216e-02	-4.541449e-03	2.664520e-02
## 9-421852	2.384671e-03	-1.449598e-02	-2.955235e-02	-1.137030e-03
## 9-421878	9.659106e-03	1.366239e-02	-1.893514e-03	-2.618751e-02
## 9-421945	-2.211676e-02	-6.020387e-03	-5.709312e-02	-9.020950e-03
## 9-421946	-1.119852e-02	-2.953283e-02	-3.933930e-03	9.696461e-03
## 9-421966	-2.211676e-02	-6.020387e-03	-5.709312e-02	-9.020950e-03
## 9-422019	-8.323804e-03	-2.027786e-02	2.283439e-02	-1.493606e-02
## 9-422055	-1.820507e-02	2.671739e-02	-8.073949e-02	-1.157006e-02
## 9-422091	-6.955236e-03	-4.156456e-02	4.085673e-02	-2.548395e-03
## 9-422098	-1.119852e-02	-2.953283e-02	-3.933930e-03	9.696461e-03
## 9-422158	3.030358e-02	-1.334936e-02	2.659115e-03	-4.995329e-02
## 9-422230	-1.264338e-02	-9.023805e-03	8.255225e-03	-8.656653e-03
## 9-422244	-1.458089e-02	3.717271e-02	-4.496293e-02	-9.232450e-03
## 9-422285	5.995618e-03	-1.808663e-02	3.104995e-02	-1.530587e-02
## 9-422372	-1.119852e-02	-2.953283e-02	-3.933930e-03	9.696461e-03
## 9-422402	-2.743603e-02	6.772818e-02	4.753028e-02	4.476020e-03
## 9-422432	-3.522580e-02	-2.451298e-02	1.449727e-02	1.230923e-02
## 9-422503	3.762926e-02	1.366005e-02	5.666695e-03	-6.605139e-02

## 9-422557	-3.941104e-02	9.494284e-02	3.521392e-02	4.726887e-03
## 9-422558	1.138326e-02	4.241040e-01	2.728054e-02	3.888976e-02
## 9-422600	-4.507659e-03	3.143395e-02	3.674256e-02	-1.679232e-02
## 9-422674	-4.200500e-02	-2.287737e-02	-8.113209e-02	2.608675e-03
## 9-422675	-1.069373e-02	2.527188e-02	1.878114e-02	3.966454e-04
## 9-422698	-5.909819e-03	-2.600031e-02	2.179868e-02	-7.186643e-03
## 9-422699	-1.658977e-02	3.995055e-02	-4.902356e-02	-9.272221e-03
## 9-422754	-2.057294e-02	-1.323750e-02	-5.132209e-02	-9.857487e-03
## 9-422880	-1.319234e-02	-3.548432e-02	2.803378e-03	2.887043e-02
## 9-422909	2.869349e-02	9.972311e-03	3.352155e-03	-4.524608e-02
## 9-422934	5.552426e-02	1.577461e-02	-7.170935e-03	3.423831e-02
## 9-422962	-8.149077e-03	-2.668450e-03	9.154786e-03	-4.164211e-03
## 9-422980	-1.973089e-02	-6.537627e-03	-1.053631e-03	6.895698e-03
## 9-423052	-1.668920e-02	4.075119e-02	2.521142e-02	5.074040e-03
## 9-423077	-9.289030e-03	3.297480e-03	1.567983e-02	8.137095e-03
## 9-423110	-2.268076e-01	2.445117e-01	-1.661632e-01	9.121302e-03
## 9-423112	2.690338e-02	-1.289493e-03	1.526226e-04	4.820452e-03
## 9-423205	1.216610e-03	-1.063329e-02	2.344100e-02	-1.592522e-02
## 9-423316	-3.381258e-03	6.725746e-03	1.656550e-02	1.977046e-04
## 9-423401	-3.281480e-01	9.686251e-02	-1.792500e-01	5.656733e-02
## 9-423405	-5.221193e-03	-7.609889e-02	1.313755e-02	3.577708e-02
## 9-423405_2	-5.417894e-03	-1.021271e-01	1.590853e-02	5.116425e-02
## 9-423465	6.053246e-02	2.813912e-02	-1.431671e-02	2.051659e-02
## 9-423487	-1.825983e-02	3.976699e-02	2.039336e-02	1.654717e-03
## 9-423505	1.530559e-01	3.446842e-02	-1.902333e-02	8.564992e-02
## 9-423522	-1.184351e-02	-2.290517e-02	-1.105692e-02	9.099015e-03
## 9-423590	6.053246e-02	2.813912e-02	-1.431671e-02	2.051659e-02
## 9-423615	-3.583146e-01	-4.221947e-02	-6.775408e-03	-6.128283e-02
## 9-423670	-1.524236e-02	-5.837060e-03	-4.244902e-02	-6.435528e-03
## 9-423672	-3.524707e-01	9.203330e-02	-7.886136e-02	1.933745e-02
## 9-423704	-2.621963e-02	-1.998979e-03	2.711050e-02	1.943644e-02
## 9-423722	-1.154633e-02	1.886304e-02	2.687181e-02	3.597445e-03
## 9-423726	-1.225143e-02	-3.000919e-02	-4.967383e-03	1.154072e-02
## 9-423754	-4.598265e-03	-2.195346e-02	2.568952e-02	-5.237086e-04
## 9-423761	-5.642000e-02	-3.821062e-02	-1.209286e-01	-8.385364e-03
## 9-423764	3.936788e-01	4.759106e-02	-2.260526e-02	3.225792e-02
## 9-423785	-1.705783e-02	2.748347e-02	5.425589e-02	8.857429e-03
## 9-423893	-2.016054e-02	-7.296693e-03	4.768256e-03	4.556603e-03
## 9-423935	-1.550147e-02	-7.863678e-03	1.478361e-02	1.557699e-02
## 9-424044	-1.306958e-02	-2.918189e-02	-6.120678e-03	1.380148e-02
## 9-424121	-1.495227e-02	-7.445570e-03	1.435482e-02	1.630517e-02
## 9-424130	-1.043206e-02	2.482432e-02	2.320317e-02	-5.056576e-04
## 9-424163	-2.621963e-02	-1.998979e-03	2.711050e-02	1.943644e-02
## 9-424172	-4.455828e-02	1.010605e-01	5.065003e-02	1.315881e-02
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## 9-424307	-6.798624e-03	-5.840580e-03	-3.203669e-02	-2.894909e-03
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## 9-436787	-6.296208e-03	-4.062173e-03	5.131159e-03	-2.711854e-02
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## 9-437613	3.438457e-02	2.372120e-03	-4.880199e-03	1.427921e-02
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## 9-437841	-1.947024e-02	4.062791e-03	7.042265e-03	1.647870e-02
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## 9-438069	-3.856717e-02	-2.088222e-03	1.232243e-03	2.340792e-02
## 9-438096	-9.535386e-03	2.449308e-04	-3.286455e-02	-3.430292e-03
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## 9-446036	-5.537703e-02	4.853877e-02	-2.020936e-01	-2.423033e-02
## 9-446136	1.131075e-02	-7.311651e-03	3.145714e-04	-3.152136e-02
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## 9-446892	-3.586131e-02	-3.167804e-03	3.236073e-02	3.044230e-02
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## 10-460057 4.085641e-01 -6.243444e-02 2.330031e-02 1.286788e-01
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## 10-460295 -2.728572e-02 3.590970e-02 -2.741906e-02 -9.842198e-04
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## 10-460369 -7.000704e-03 9.392986e-03 2.471144e-02 2.473396e-03
## 10-460377 -1.818779e-03 -3.710612e-02 -3.302960e-02 -1.191791e-02
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## 10-460732 -1.481314e-02 -5.210746e-02 4.827905e-03 3.524471e-02
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## 10-482934 -3.470616e-02 1.258899e-02 1.698873e-02 3.044737e-02
## 10-483011 -1.204295e-02 1.735414e-02 -6.983662e-02 -5.218453e-03
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## 10-484842 -1.540557e-02 -9.120823e-02 1.203748e-02 5.338260e-02
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## 10-484925 -1.884095e-02 4.207619e-02 2.444122e-02 -1.212979e-03
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## 10-485460 -2.681982e-03 -4.278571e-02 6.458618e-02 -2.156318e-02
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## 11-504937 3.793337e-02 7.863469e-03 -4.549706e-03 2.165214e-02
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## 11-504976 -2.494426e-02 6.327056e-02 -1.072903e-02 -4.903172e-03
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## 11-528669  5.517426e-02  1.628381e-02  8.156991e-03 -6.156866e-02
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## 11-528959 -1.908300e-02 -4.174789e-03 -1.159028e-01 -7.641268e-03
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## 11-535357 -1.379635e-02  2.944591e-02 -2.724292e-02 -6.925093e-03
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## 11-542628 -9.736171e-03 9.417918e-03 2.152105e-02 1.033362e-02

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## 11-542643  2.964220e-02  1.133000e-02  4.641963e-03 -5.091813e-02
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## 11-542703  7.124579e-02  4.084609e-02 -8.418300e-03 -8.964023e-03
## 11-542704 -1.372513e-02  1.909140e-02  1.508597e-02  8.390704e-03
## 11-542749 -6.539553e-03 -3.936013e-03 -6.580911e-02 -3.627930e-03
## 11-542895  8.094109e-04  1.307682e-02  4.116569e-03 -8.532527e-03
## 11-542908 -1.281287e-02 -3.028745e-02 -5.576685e-03  1.029693e-02
## 11-542909 -7.044392e-02 -1.055291e-02 -1.384305e-01 -9.099575e-04
## 11-542925  1.054974e-01  2.149454e-02 -1.088106e-02  4.976793e-02
## 11-542926 -5.535473e-03  8.382204e-03  2.333921e-02  5.828596e-03
## 11-542929 -2.305224e-02 -7.446634e-03  3.868628e-02  2.249685e-02
## 11-542982  1.891128e-02  5.214154e-03  1.964465e-03 -3.279957e-02
## 11-542996  1.754414e-02 -2.266769e-02  2.090174e-03 -5.301811e-02
## 11-543057  1.054974e-01  2.149454e-02 -1.088106e-02  4.976793e-02
## 11-543058  2.371984e-02 -9.227584e-03  1.123124e-03 -3.594713e-02
## 11-543071 -1.032547e-02  6.006142e-03 -3.222301e-02 -2.362633e-03
## 11-543132 -1.164264e-02  4.163976e-03 -4.038804e-02 -3.682437e-03
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## 11-543184  1.421713e-02  1.281669e-02  1.465446e-02 -2.249232e-02
## 11-543241 -5.814420e-02 -3.239093e-02  5.130446e-02  1.876335e-02
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## 11-543565 -2.224191e-02  6.008058e-03  1.404306e-03  1.672326e-02
## 11-543619 -6.326262e-03 -2.196402e-02  2.742696e-02 -2.636564e-02
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## 11-543944 -1.458867e-02  2.382027e-02  9.019055e-03  6.650827e-03
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## 11-543954 -9.895145e-03  2.473896e-02 -2.716503e-02 -4.218378e-03
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## 11-544303 -3.055613e-02 -1.314938e-02 7.634712e-03 1.190094e-02
## 11-544312 -1.777487e-02 4.115755e-02 2.540908e-02 -9.716342e-04
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## 11-544495 -1.737227e-02 -2.139076e-02 1.956033e-02 -1.320742e-02
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## 11-545000 4.591550e-02 8.120602e-03 -2.543488e-03 1.331755e-02
## 11-545114 1.281105e-01 7.607492e-02 3.702771e-02 -6.279098e-02
## 11-545170 2.226123e-03 -2.641182e-02 4.181175e-02 -1.799735e-02
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## 11-545246 -1.719624e-03 2.617107e-02 1.001738e-02 -1.247341e-02
## 11-545264 1.402104e-02 -1.869907e-02 1.984432e-03 -4.455676e-02
## 11-545267 5.599904e-02 1.430156e-02 -1.110937e-02 2.538771e-02
## 11-545341 -1.147815e-02 -1.699777e-02 1.796198e-02 -1.575581e-03
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## 11-545478 -1.223907e-02 3.360612e-02 4.108613e-02 -1.258939e-02
## 11-545486 8.025228e-02 1.577570e-02 -1.119593e-02 4.006044e-02
## 11-545522 1.981145e-02 6.073033e-03 -1.616312e-04 -1.774717e-02
## 11-545537 4.573828e-01 8.141398e-02 1.123755e-02 4.119876e-02
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## 11-545901 -1.753439e-02 4.011845e-02 2.396950e-02 -2.501245e-04
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## 11-546125 -1.941076e-02 -4.519617e-02 -8.525749e-03 1.302695e-02
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## 11-546355    6.803178e-03  9.409904e-03  1.583340e-02 -1.876936e-02
## 11-546379   -6.207114e-03  4.123785e-02  4.708008e-02 -1.556123e-02
## 11-546395   -1.935294e-02  1.108258e-02  8.126932e-04  1.377775e-02
## 11-546405   -1.107745e-02  1.159799e-02 -4.093496e-02 -3.686626e-03
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## 11-546415    4.344597e-02  3.396727e-02 -1.966212e-03  2.656807e-02
## 11-546457   -1.154600e-02  -3.205262e-02 -4.025398e-03  1.046647e-02
## 11-546465    1.178554e-02  -7.085453e-03 -7.500339e-04 -3.708517e-02
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## 11-546518    4.344597e-02  3.396727e-02 -1.966212e-03  2.656807e-02
## 11-546525    6.866632e-02  7.738737e-03 -6.090554e-03  8.113166e-03
## 11-546590   -1.169869e-02  -5.523448e-02 -9.568980e-03 -2.851697e-02
## 11-546600   -1.392604e-02  1.031647e-02 -3.502853e-03  5.312177e-03
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## 11-546628    4.364091e-02  5.820537e-03 -6.649860e-03  2.225479e-02
## 11-546633   -7.240404e-03  -7.038243e-03  1.286232e-02 -2.161241e-02
## 11-546663    9.311782e-02  3.528537e-02 -1.384462e-02  6.601450e-02
## 11-546720    3.338366e-02  1.596339e-02 -6.775972e-03  2.869119e-02
## 11-546742   -2.546836e-02  -1.514299e-02 -3.339647e-02  1.111863e-02
## 11-546797   -1.891435e-02  1.083023e-02  2.617556e-04  1.329879e-02
## 11-546807    5.449922e-03  1.750887e-02 -1.700083e-03 -2.393651e-02
## 11-546824    5.449922e-03  1.750887e-02 -1.700083e-03 -2.393651e-02
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## 11-546941    1.253463e-03  2.856831e-02  1.270394e-02 -2.697558e-02
## 11-547018   -2.572702e-02  -1.907888e-02 -6.534581e-02 -1.943863e-02
## 11-547120   -9.687093e-03  2.887211e-03  1.753548e-02  8.567786e-03
## 11-547136    5.605837e-02  -1.265528e-05 -5.683599e-03  7.866730e-03
## 11-547153    4.901255e-02  8.285638e-03  9.360521e-04 -2.047270e-03
## 11-547265   -4.046278e-03  -6.042020e-02  9.913384e-03  3.284475e-02
## 11-547269    7.345849e-02  3.303102e-02 -1.274491e-02  6.259173e-02
## 11-547290   -2.068961e-02  1.336405e-03 -1.019278e-02  8.199058e-03
## 11-547469    2.869098e-02  7.457312e-05  3.096840e-03 -1.514039e-02
## 11-547490   -2.572702e-02  -1.907888e-02 -6.534581e-02 -1.943863e-02
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## 11-547651   -1.898253e-02  9.153900e-04 -1.000821e-02  6.989296e-03
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## 11-547709   -3.030366e-03  -3.153764e-02  3.495783e-02 -1.343683e-02
## 11-547720   -2.071839e-01  -2.759737e-01 -1.615456e-01  1.040922e-01
## 11-547786    5.906229e-03  -3.597462e-02 -8.215358e-03 -2.835824e-02
## 11-547826    8.027284e-03  1.143370e-02  3.243371e-03 -1.228009e-02
## 11-547873    5.266603e-03  -2.275208e-02 -2.675553e-02 -1.260503e-02
## 11-547894    6.234690e-03  1.779941e-02 -2.891033e-03 -2.672586e-02
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## 11-548127   -1.262922e-03  -4.052246e-03  1.793476e-03 -1.788897e-02
## 11-548169   -3.748314e-02  7.586733e-02  9.237204e-02  5.802054e-03
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## 11-548745 1.118525e-02 -1.528095e-02 1.482000e-03 -2.610043e-02
## 11-548834 3.325659e-02 1.556570e-02 -6.171618e-03 2.962909e-02
## 11-548914 3.328948e-01 7.389401e-02 -1.382345e-01 1.201720e-01
## 11-548952 -2.725876e-03 -3.804223e-03 9.516655e-04 -1.616521e-02
## 11-549033 -9.267428e-03 1.896636e-02 1.949240e-02 5.532348e-03
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## 11-549347 -6.740179e-03 -7.811664e-03 2.316140e-02 7.009092e-03
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## 11-549367 -1.694165e-02 -2.718097e-03 1.670269e-03 7.850334e-03
## 11-549391 -5.043362e-03 -6.178068e-02 9.750375e-03 3.403965e-02
## 11-549408 2.434290e-02 -7.674932e-03 -3.821360e-03 -5.433772e-02
## 11-549430 -3.140459e-02 -1.145497e-02 -8.701788e-04 4.687284e-03
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## 12-550062 -1.403430e-02 3.756209e-02 3.736331e-02 1.378136e-03
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## 12-550126 -9.557253e-03 1.673376e-03 1.181127e-02 -4.490999e-03
## 12-550131 -1.863867e-02 -2.402959e-04 1.960024e-02 1.393082e-02
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## 12-550354 -5.724353e-03 8.934435e-03 -4.621924e-02 -1.233948e-02
## 12-550356 8.293138e-03 3.183798e-02 7.230777e-04 -3.940407e-02
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## 12-550438 -4.801606e-02 -8.065442e-03 -1.146871e-01 -7.525926e-03
## 12-550515 -1.942432e-02 2.857057e-02 -6.035376e-02 -1.026751e-02
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## 12-550871 3.293253e-02 1.404455e-02 -8.817053e-03 1.528766e-02
## 12-550909 1.250109e-02 4.260968e-02 -2.732556e-02 3.620506e-02
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## 12-551439 -9.985040e-03 -1.067160e-01 1.632422e-02 5.828106e-02
## 12-551456 -2.910500e-02 1.525189e-02 7.846259e-02 2.247528e-02
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## 12-552827 -1.456955e-02 -3.869511e-03 4.198339e-03 -1.325697e-02
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## 12-553017 -1.772527e-02 -1.599058e-02  2.996673e-02 -4.037768e-02
## 12-553026 -1.946476e-02 -2.347558e-04  2.020551e-02  1.462363e-02
## 12-553074 -5.378543e-03  2.609882e-02  6.450765e-03 -1.290057e-02
## 12-553088 -3.304845e-02 -2.992699e-02  2.590439e-02  5.088221e-04
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## 12-553383 -8.896995e-03  1.623125e-02  3.158850e-02 -9.658664e-04
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## 12-554372 -4.501391e-02 -2.275720e-02  1.944241e-02  5.618534e-03
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## 12-554410 -3.689031e-02  1.213909e-02  2.717781e-02  3.588262e-02
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## 12-554972 -5.823346e-05 -2.396155e-02  3.792453e-02 -1.932739e-02
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## 12-555199 -1.327452e-02  2.577898e-02 -3.559171e-02 -5.858294e-03
## 12-555218 -4.074988e-03 -1.383309e-02  2.328801e-02 -5.891045e-02
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## 12-555426 -1.327452e-02  2.577898e-02 -3.559171e-02 -5.858294e-03
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## 12-555498  5.438828e-02  1.271935e-02 -2.280659e-03  5.491527e-03
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## 12-555627  1.822648e-04 -2.519910e-02 -4.356284e-02 -9.260798e-03
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## 12-555780 -1.409405e-02 -4.510600e-03  7.099496e-03 -1.525101e-02
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## 12-556888 -5.886054e-03 -6.541715e-04  6.921942e-04 -1.112197e-02
## 12-556899 -1.043192e-02 -4.727290e-02  4.515579e-02 -1.431273e-02
## 12-556971  4.754077e-02  2.310424e-02 -1.180943e-02  2.292389e-02
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## 12-565164 -4.688982e-03 1.397387e-02 -2.508165e-02 -1.443514e-03
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## 12-587849 1.014043e-01 2.970296e-02 -1.285512e-02 6.256203e-02
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## 12-588094 -1.955482e-02  1.885561e-02  2.171067e-02  1.411343e-02
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## 12-588109 -3.164571e-02  7.281922e-02 -7.045934e-03  2.225869e-03
## 12-588147 -6.426203e-03  9.845106e-06  4.606302e-04 -1.008047e-02
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## 12-588222  4.448739e-02 -2.542712e-02 -5.842226e-03 -8.541631e-02
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## 12-588251  6.337329e-02  1.692337e-02 -7.483437e-03  3.889739e-02
## 12-588392  6.165321e-02  1.650114e-02 -7.214244e-03  3.792565e-02
## 12-588420 -1.669316e-02 -1.173866e-02  1.121544e-02  3.575798e-03
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## 12-588541 -1.101706e-02  8.641633e-03  1.406170e-02  1.071895e-02
## 12-588542 -1.199176e-02  7.918233e-03 -3.441530e-02 -3.256086e-03
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## 12-590424 -1.576933e-03 -1.705528e-02 -5.502187e-02 -3.366139e-03
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## 12-590551 -3.443188e-03 -2.294612e-02  2.967933e-02 -2.130227e-02
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## 12-590664 -4.876054e-02 -7.130561e-02  1.101204e-01  8.512125e-03
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## 12-590809 -1.550797e-02 -6.575199e-03  6.453341e-03 -7.372941e-03
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## 12-590853 -2.148758e-02 -5.224354e-03 -4.478623e-02 -5.868028e-03
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## 12-590868 -1.467950e-02  1.485000e-02  2.725123e-02  6.420178e-03
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## 12-591701 -3.115484e-03 -2.981907e-02  3.789151e-02 -2.565746e-02
## 12-591718 -1.272554e-02  3.202868e-02 -2.303587e-02 -6.741737e-03
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## 12-592022 -3.880449e-04  1.362568e-02  1.566828e-02 -8.757423e-03
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## 12-594090 -1.802962e-02 -7.406975e-04  3.321030e-03  1.117230e-02
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## 12-594403 -1.681945e-02  8.232977e-03  6.841552e-02  2.149149e-02
## 12-594472  1.328394e-01  4.449732e-02 -1.753670e-02  9.193334e-02
## 12-594525 -1.299453e-02 -2.496565e-02 -7.424509e-03  1.474250e-02
## 12-594564 -6.599489e-03  3.924910e-02  1.797012e-02 -2.262222e-02
## 12-594605  3.891105e-02  8.354702e-03  5.939656e-03 -3.313245e-02
## 12-594622  4.514989e-02  1.280648e-02  1.056899e-02 -4.999939e-02
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## 12-594791  2.365076e-02 -1.811496e-02 -7.746732e-03 -8.675918e-02
## 12-594873 -7.722484e-03  1.497994e-02 -3.131489e-02 -3.485605e-03
## 12-594938  1.139290e-01  2.676968e-02 -1.554084e-02  6.981367e-02
## 12-594948  5.194002e-02  6.177340e-03  3.808870e-04  3.394543e-03
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## 12-595093  6.908920e-02  2.300385e-02 -8.327086e-03  4.842521e-02
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## 13-631223 -4.460303e-02 -3.709609e-02  2.190291e-02  6.703300e-03
## 13-631251 -1.994754e-02 -5.805447e-03  1.548080e-02 -2.066919e-02
## 13-631259  1.780083e-02  1.158675e-02  1.069694e-02  1.178242e-02
## 13-631263 -1.785965e-02 -1.115880e-02  1.977424e-02  1.122768e-02
## 13-631289  3.922612e-02 -1.423696e-02 -3.139794e-03 -3.347087e-02
## 13-631343  1.437208e-02  1.124803e-02 -2.968819e-03 -1.527691e-02

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## 13-631370 -1.135029e-02 -3.197303e-02 5.708010e-02 -4.330787e-02
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## 13-631406 1.498592e-02 -1.746355e-02 -3.304941e-02 -1.484855e-02
## 13-631429 -8.639379e-03 1.611128e-02 2.427354e-02 -1.330134e-03
## 13-631454 -8.591316e-03 1.100278e-02 2.865652e-02 1.015726e-03
## 13-631512 5.592672e-02 1.830858e-02 -7.426975e-03 4.370065e-02
## 13-631662 -1.425497e-02 -4.056244e-02 -8.732531e-03 1.181727e-02
## 13-631782 -2.933396e-02 3.914846e-03 2.112038e-03 1.895652e-02
## 13-631838 -1.674790e-02 -5.621068e-03 1.572664e-02 1.491659e-02
## 13-631863 -6.745602e-03 1.268318e-02 -2.123331e-02 -4.602456e-03
## 13-631888 6.626872e-02 5.347462e-02 3.888562e-02 -7.138553e-02
## 13-631934 -2.102227e-02 4.905267e-02 2.445201e-02 1.930319e-03
## 13-632023 1.988423e-03 -1.266576e-02 -3.135445e-02 -1.481860e-03
## 13-632031 -1.667845e-02 -1.090986e-01 9.471437e-03 6.254438e-02
## 13-632054 -1.733565e-02 3.891965e-02 1.877541e-02 8.695508e-03
## 13-632060 -8.912127e-03 1.575926e-02 2.740934e-02 -3.764834e-04
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## 13-632158 1.837688e-02 5.344555e-03 3.639313e-03 -3.078354e-02
## 13-632174 -1.384914e-02 7.765681e-03 1.256216e-02 1.290894e-02
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## 13-632326 -1.560025e-02 -1.025635e-01 8.904535e-03 5.820509e-02
## 13-632356 5.729133e-02 1.473697e-02 -3.852570e-03 2.435452e-02
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## 13-632627 -1.635199e-02 -8.575790e-02 6.799991e-03 4.820338e-02
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## 13-632850 -1.030711e-02 -3.192459e-02 -5.402719e-03 3.166001e-03
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## 13-633666 -2.168949e-02 4.997864e-02 2.402787e-02 1.139831e-02
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## 13-634068 -9.043070e-03 1.838183e-02 2.589841e-02 -1.881717e-03
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## 13-634177 -2.168949e-02 4.997864e-02 2.402787e-02 1.139831e-02
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## 13-634258 -1.822994e-02 -3.124886e-03 -3.732236e-02 -2.176118e-03
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## 13-634264 -7.290172e-03 1.854913e-02 -3.851578e-02 -6.146997e-03
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## 13-634427 -1.224906e-03 -5.194932e-02 -2.341600e-02 -6.110497e-03
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## 13-634954 -1.972597e-02 5.115934e-02 5.096869e-02 -1.274038e-03
## 13-635021 -4.502904e-02 -4.533628e-02 9.273399e-02 -1.777379e-02
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## 13-635142 -5.502852e-03 -3.017713e-02 2.579653e-02 -1.011343e-02
## 13-635185 -6.630935e-03 -1.043064e-02 1.947327e-02 -1.526869e-02
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## 13-635216 3.076168e-02 1.184249e-02 1.015532e-03 2.601351e-02
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## 13-635313 -2.779100e-02 6.579589e-02 1.371863e-02 6.113002e-03
## 13-635324 -1.025013e-02 1.307758e-02 2.801779e-02 2.618204e-03
## 13-635376 -9.560213e-03 2.313556e-02 -3.149955e-02 -3.399827e-03
## 13-635411 1.566518e-02 -5.565712e-03 -3.372332e-03 -2.360019e-02
## 13-635419 -3.836991e-02 9.634719e-02 8.289112e-02 -5.867211e-03
## RDA5 RDA6
## 1-8 3.509916e-03 2.687351e-02
## 1-27 1.184917e-03 2.559136e-03
## 1-34 1.978913e-02 -8.172068e-03
## 1-81 2.616596e-02 -2.472360e-03
## 1-97 1.391231e-02 4.642863e-03
## 1-153 -2.908730e-02 -3.785890e-03
## 1-154 -2.336484e-02 -2.028346e-02
## 1-206 2.100212e-02 -1.000499e-02
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## 1-364      2.145133e-03  1.407731e-02
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## 1-689      -4.785864e-03  -1.297683e-02
## 1-837      -2.184487e-03  4.350130e-03
## 1-846      -2.424882e-02  -2.089582e-03
## 1-869      -3.736935e-02  6.052416e-02
## 1-921      -3.634897e-03  -1.135027e-02
## 1-933      -3.442381e-03  3.885600e-02
## 1-1024     -1.309864e-02  1.727974e-02
## 1-1029     1.243575e-02  4.851342e-03
## 1-1091     5.226532e-02  -2.825441e-02
## 1-1113     -3.036099e-02  -2.647022e-02
## 1-1155     -6.543116e-03  1.438974e-02
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## 1-1259     -1.421024e-02  -1.160139e-02
## 1-1301     -2.914567e-02  2.138615e-02
## 1-1317     -3.442381e-03  3.885600e-02
## 1-1349     4.720937e-02  -1.911876e-03
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## 1-1444     1.765012e-02  1.059210e-02
## 1-1494     -1.615379e-02  -1.159140e-03
## 1-1499     -5.745656e-02  -2.821395e-03
## 1-1538     -1.905250e-02  -1.025028e-02
## 1-1566     -6.326088e-03  -3.034437e-03
## 1-1600     1.825909e-02  1.211874e-02
## 1-1635     1.316894e-03  4.369991e-03
## 1-1650     -6.483011e-02  -5.577805e-03
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## 1-1731     -6.895788e-02  -6.509515e-03
## 1-1793     -1.966946e-02  6.102323e-02
## 1-1820     -1.172549e-02  -5.174619e-02
## 1-1823     -1.383572e-02  1.685445e-02
## 1-1851     1.957439e-03  -4.601196e-03
## 1-1863     -6.851941e-03  -1.437957e-02
## 1-1903     -2.040290e-02  -1.351774e-02
## 1-1928     -1.686800e-02  -7.983269e-03
## 1-1928_2   -1.905250e-02  -1.025028e-02
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## 1-1955     1.562357e-02  3.382976e-03
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## 1-2061     2.700956e-03  8.628353e-03
## 1-2085     1.178476e-02  4.547222e-03
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## 1-2228      2.402839e-03  1.459007e-02
## 1-2272      2.102128e-03  4.160692e-03
## 1-2293      1.790663e-02  1.220106e-02
## 1-2315      1.516920e-02  7.029457e-03
## 1-2374      2.402839e-03  1.459007e-02
## 1-2402      -1.920124e-03 -4.791367e-03
## 1-2443      -6.709967e-04  6.787750e-03
## 1-2494      2.163398e-03  7.540411e-03
## 1-2524      -1.690397e-02 -1.349358e-03
## 1-2573      5.214973e-02  -1.282407e-02
## 1-2594      -2.475437e-02  6.615472e-02
## 1-2628      8.166739e-02  -2.035957e-02
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## 1-2954      -1.641644e-04 -7.927775e-03
## 1-2998      -1.719252e-02 -3.313073e-03
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## 1-3185      -6.847270e-04 -8.499356e-03
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## 1-3391      6.005452e-03  1.809890e-02
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## 1-3588      -2.690726e-03 -8.291082e-03
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## 1-3757      1.246212e-02  -2.176881e-03
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## 1-3837      -1.037442e-02  1.787582e-02
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## 1-3994      -1.037442e-02  1.787582e-02
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## 1-4234      -7.056576e-03  -1.434858e-02
## 1-4251      3.578242e-02  8.870536e-03
## 1-4270      2.170676e-02  -1.734216e-03
## 1-4278      -4.637070e-04  -8.794869e-03
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## 1-4335      -1.505647e-03  9.817545e-03

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## 1-4796      -9.926083e-03  -4.466670e-03
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## 1-4879       2.489458e-02  3.800413e-02
## 1-4883      -1.891730e-02  -1.992672e-03
## 1-4952      -7.056576e-03  -1.434858e-02
## 1-4987      -4.942578e-03  4.954641e-02
## 1-5005      -1.333715e-02  1.760029e-02
## 1-5074      -1.058694e-03  8.401311e-03
## 1-5087       2.614259e-02  3.740820e-03
## 1-5156      -5.584967e-02  -9.731507e-03
## 1-5158       4.230236e-02  3.149499e-03
## 1-5232       1.347898e-02  3.418390e-02
## 1-5270      -2.107808e-02  1.112467e-02
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## 1-5307       3.192448e-04  4.622224e-03
## 1-5315       1.903867e-02  -3.654652e-02
## 1-5336      -4.180777e-02  7.913859e-03
## 1-5374      -4.162550e-03  -1.367655e-02
## 1-5376      -1.032900e-02  -6.771368e-03
## 1-5399      -1.853069e-02  -6.540823e-03
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## 1-5494       3.847859e-03  -9.097846e-03
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## 1-5570       4.675494e-03  2.984404e-03
## 1-5588       5.086432e-03  3.278065e-02
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## 1-5679       1.903867e-02  -3.654652e-02
## 1-5680      -3.257684e-02  -7.698243e-05
## 1-5687      -4.305311e-03  -1.612802e-04
## 1-5781      -8.731827e-03  2.960924e-02
## 1-5843      -8.668549e-05  -2.019645e-02
## 1-5861       4.722320e-03  -5.972206e-03
## 1-5874       6.284924e-03  6.273610e-03
## 1-5896      -2.530591e-02  -1.995530e-03
## 1-5957       1.074821e-02  4.629997e-03
## 1-6071       4.937707e-03  1.069542e-02
## 1-6116      -2.525716e-02  1.333512e-02
## 1-6230      -9.318285e-03  1.030107e-02
## 1-6236      -3.274059e-02  -1.407500e-02
## 1-6245      -1.204273e-02  4.334938e-02
## 1-6262      1.253733e-02  2.290629e-03
## 1-6433       8.497445e-03  -2.912520e-02
## 1-6588       7.422396e-02  -1.658288e-02
## 1-6703       9.796628e-03  7.382983e-03
## 1-6787      -1.423440e-02  -6.044193e-02
## 1-6891      -1.463004e-03  1.414089e-02
## 1-6928      -2.143880e-02  -1.072420e-02

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## 1-6956      -1.974504e-02 -1.347741e-03
## 1-6998      -7.432205e-03  6.064778e-04
## 1-6999      -2.758179e-02 -4.662883e-03
## 1-7048      -1.602680e-02 -3.156145e-03
## 1-7072      -8.742957e-02 -1.012250e-01
## 1-7089      -2.020401e-02  4.225746e-04
## 1-7089_2    1.497800e-02 -6.306055e-03
## 1-7094      -4.565154e-03 -1.144534e-02
## 1-7117      -3.413855e-02 -3.655437e-02
## 1-7182      -3.205657e-03  2.343816e-02
## 1-7237      -1.602680e-02 -3.156145e-03
## 1-7251      1.577674e-03 -4.245556e-03
## 1-7281      -2.960806e-03  5.057450e-04
## 1-7304      -2.953296e-02 -9.842675e-03
## 1-7309      2.372241e-02  7.327172e-03
## 1-7315      1.435138e-02 -1.008237e-02
## 1-7344      1.519978e-01 -2.291960e-02
## 1-7348      1.435138e-02 -1.008237e-02
## 1-7386      -2.128252e-02 -2.862476e-02
## 1-7437      1.696228e-02  3.722032e-02
## 1-7465      -9.631921e-04 -1.243698e-02
## 1-7487      -4.597228e-02 -3.412980e-02
## 1-7572      -4.794626e-03  2.136735e-02
## 1-7581      1.505993e-02  3.116712e-02
## 1-7616      5.417013e-03 -4.881712e-03
## 1-7670      1.117483e-02  4.051150e-03
## 1-7683      2.639966e-02  1.430886e-03
## 1-7718      -9.143062e-02  3.290633e-02
## 1-7725      -2.874902e-02  1.213836e-02
## 1-7732      -5.522944e-03 -1.308519e-02
## 1-7760      5.742441e-03 -1.733816e-03
## 1-7798      -2.986582e-04 -8.318211e-03
## 1-7819      1.961807e-02 -7.077214e-03
## 1-7852      2.711226e-02  1.088806e-02
## 1-7880      3.424634e-02 -4.584850e-02
## 1-7897      -3.205657e-03  2.343816e-02
## 1-7998      -2.031734e-02  4.261502e-02
## 1-8005      -6.253379e-03  6.396541e-02
## 1-8017      4.271352e-03  3.307148e-03
## 1-8055      -3.205657e-03  2.343816e-02
## 1-8074      3.715952e-02  1.148853e-02
## 1-8108      3.103913e-02  1.517817e-02
## 1-8187      -8.048033e-04 -1.180205e-02
## 1-8236      2.174345e-03  4.145763e-03
## 1-8239      -4.584117e-03  8.825000e-03
## 1-8243      4.578284e-03  3.026957e-02
## 1-8317      5.065234e-02 -3.474690e-02
## 1-8356      -2.508424e-02 -5.474286e-03
## 1-8413      -4.373402e-04 -8.612897e-03
## 1-8430      -8.161745e-03 -4.981679e-02
## 1-8474      -3.425368e-03  2.199423e-02
## 1-8486      4.943464e-06 -2.554195e-02
## 1-8487      -6.931534e-04 -1.108234e-02
## 1-8599      2.385687e-02  2.317352e-02

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## 1-8613      4.887402e-03 -6.268287e-03
## 1-8623      3.250841e-03  3.643543e-03
## 1-8641      3.819236e-02 -1.552852e-02
## 1-8651      1.227406e-02  2.656440e-03
## 1-8716      -4.962887e-03 -9.897646e-03
## 1-8765      -4.951973e-04 -1.178769e-02
## 1-8844      1.595243e-03  9.206055e-03
## 1-8857      7.616736e-03 -2.066049e-03
## 1-8896      -7.913789e-03 -8.589838e-03
## 1-8933      9.331107e-03  2.018713e-02
## 1-9078      -2.836916e-02 -2.961265e-04
## 1-9086      1.022300e-02  3.441961e-02
## 1-9087      9.646516e-03  2.153379e-02
## 1-9123      -3.865062e-02  3.290482e-02
## 1-9153      -9.372166e-03  1.231064e-02
## 1-9155      2.299031e-02  2.305049e-02
## 1-9190      2.140628e-02  2.045986e-02
## 1-9266      -1.800327e-02  1.387510e-02
## 1-9280      4.429833e-03 -1.308076e-02
## 1-9341      5.114848e-03  1.754193e-02
## 1-9626      -5.477907e-03 -1.118552e-02
## 1-9666      -8.389891e-03 -6.055768e-03
## 1-9684      -1.366355e-02  1.279802e-02
## 1-9698      -5.971891e-03 -1.176445e-02
## 1-9705      -2.697886e-02 -1.360234e-02
## 1-9762      7.636928e-03  8.753383e-03
## 1-9775      -1.563571e-02 -1.239607e-02
## 1-9812      -3.973283e-02 -6.301238e-03
## 1-9829      -7.412593e-03 -1.638283e-02
## 1-9859      -4.768114e-02 -6.247270e-03
## 1-9928      -6.839055e-04  1.022461e-02
## 1-9997      -8.737324e-03 -1.570500e-03
## 1-10005     -4.122836e-03  5.121642e-02
## 1-10038     4.879210e-03 -6.924405e-03
## 1-10095     -2.791667e-03  2.509657e-02
## 1-10124     -2.200894e-02  2.103795e-02
## 1-10133     -8.576443e-03  1.333095e-02
## 1-10175     2.928559e-02  1.921351e-02
## 1-10181     -2.011825e-02 -1.645991e-02
## 1-10209     -7.553790e-03 -1.156924e-02
## 1-10313     -8.992458e-03  1.452782e-02
## 1-10372     -4.893217e-03 -2.895652e-02
## 1-10439     1.146348e-03 -7.158905e-03
## 1-10462     -2.850616e-03 -7.047519e-04
## 1-10531     -2.472595e-03  2.813215e-02
## 1-10535     3.199388e-02 -2.685400e-02
## 1-10541     1.029092e-02  5.615958e-03
## 1-10573     2.818497e-03  1.331938e-03
## 1-10573_2   -3.035945e-02 -1.454601e-02
## 1-10719     3.462270e-02 -2.128457e-02
## 1-10732     -6.348577e-03 -1.267603e-02
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## 1-10824     -8.992458e-03  1.452782e-02

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## 1-10902      -3.499607e-02 -2.783459e-02
## 1-10902_2    3.832998e-03  7.837272e-04
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## 1-10989      3.956393e-03  3.173987e-04
## 1-10994      3.560410e-02  -1.899899e-02
## 1-11014      4.169294e-02  -2.397191e-02
## 1-11014_2    2.282042e-02  -1.033955e-02
## 1-11063      -1.945747e-02  -2.063238e-02
## 1-11268      1.497147e-01  5.691943e-02
## 1-11315      4.623295e-03  -3.499196e-03
## 1-11334      -4.095738e-02  -4.555831e-03
## 1-11339      -1.016287e-03  -7.434445e-03
## 1-11366      7.045582e-03  4.980809e-02
## 1-11369      1.783724e-02  1.712820e-02
## 1-11455      3.665474e-02  -2.154809e-02
## 1-11469      -8.189533e-03  -2.006919e-03
## 1-11499      -8.620198e-03  -9.453238e-03
## 1-11525      2.159123e-02  -4.181830e-02
## 1-11525_2    2.248327e-02  3.439209e-02
## 1-11667      7.898127e-03  1.117479e-02
## 1-11680      -7.462990e-03  1.738935e-02
## 1-11706      -6.711230e-06  -4.517053e-03
## 1-11731      -1.047569e-02  5.077112e-04
## 1-11788      5.016872e-03  9.400044e-05
## 1-11789      -4.019032e-02  -4.858523e-03
## 1-11885      -1.119540e-02  1.905715e-02
## 1-11899      -7.693775e-03  5.372017e-03
## 1-11927      -1.023289e-02  1.378023e-02
## 1-11935      2.465604e-02  -4.730824e-02
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## 1-12041      4.902743e-03  -8.641923e-04
## 1-12062      3.760546e-03  7.532871e-03
## 1-12113      1.783724e-02  1.712820e-02
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## 1-12327      -3.560428e-03  -8.535039e-03
## 1-12356      8.492686e-03  1.202943e-02
## 1-12365      1.609377e-03  -4.247066e-03
## 1-12439      2.628618e-03  1.820856e-03
## 1-12561      1.388600e-02  3.838364e-04
## 1-12572      2.965626e-02  6.985234e-03
## 1-12636      -4.456814e-03  -2.897733e-02
## 1-12681      -3.039134e-02  2.073390e-02
## 1-12704      2.233913e-02  -1.860671e-02
## 1-12713      -9.333000e-04  -2.660989e-02
## 1-12770      1.567372e-02  7.543123e-03
## 1-12784      1.173805e-02  -3.516595e-03
## 1-12827      1.902501e-02  5.654427e-03
## 1-12959      7.760160e-02  -6.362892e-04
## 1-13069      8.177228e-03  -4.019891e-04
## 1-13165      -8.678207e-03  6.829689e-02
## 1-13169      3.299540e-02  7.012611e-02
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## 1-13507      1.257760e-02  2.258341e-03

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## 1-13616      -9.369720e-03 -4.318274e-03
## 1-13748      1.997225e-02  3.383610e-03
## 1-13748_2    1.228350e-03 -3.361595e-03
## 1-13839      -1.061040e-02  2.393405e-02
## 1-13885      -1.608853e-03 -1.381798e-02
## 1-13887      -1.154089e-02 -8.921666e-03
## 1-13959      6.543363e-03 -1.364132e-03
## 1-14000      2.395283e-02  4.066109e-03
## 1-14005      -1.253946e-02  1.370190e-02
## 1-14071      -1.218942e-03 -1.453307e-02
## 1-14072      -2.257650e-02 -3.355339e-02
## 1-14078      -1.218942e-03 -1.453307e-02
## 1-14163      5.047728e-03  2.481667e-03
## 1-14187      -1.699715e-02 -1.404746e-02
## 1-14251      7.385091e-02 -9.234472e-02
## 1-14269      -2.681092e-02 -5.522127e-03
## 1-14275      -3.638262e-02 -1.718501e-03
## 1-14287      -1.368839e-03  8.743808e-03
## 1-14287_2    -1.103109e-03 -1.410596e-02
## 1-14397      -5.799609e-02 -1.497762e-02
## 1-14403      2.776002e-02  3.214646e-02
## 1-14459      1.881183e-02  8.041066e-03
## 1-14546      -3.264930e-02 -4.672286e-03
## 1-14609      -1.699715e-02 -1.404746e-02
## 1-14612      -3.148194e-02 -1.328811e-03
## 1-14670      -2.173817e-02 -2.618557e-02
## 1-14764      -2.714731e-02 -2.174808e-03
## 1-14769      2.480639e-02 -8.843518e-03
## 1-14795      1.257760e-02  2.258341e-03
## 1-14820      2.923081e-02  3.152138e-02
## 1-14876      -2.243977e-02 -1.041179e-02
## 1-14940      1.612751e-02  1.352544e-03
## 1-15035      4.528504e-03  1.986167e-03
## 1-15044      -2.111468e-02  4.478165e-03
## 1-15058      -1.130339e-03  9.742431e-03
## 1-15123      1.346792e-02 -3.873625e-02
## 1-15163      1.919978e-02  7.932666e-03
## 1-15174      -1.130339e-03  9.742431e-03
## 1-15186      -9.030928e-03 -2.288049e-03
## 1-15192      4.697553e-02 -1.812270e-02
## 1-15217      -2.313452e-02 -1.112513e-02
## 1-15309      -1.142669e-02 -7.797355e-03
## 1-15336      1.886797e-02  3.970716e-02
## 1-15357      1.109660e-02 -3.788536e-02
## 1-15397      1.458790e-02  5.449593e-03
## 1-15418      3.635874e-02  4.429662e-03
## 1-15447      1.138971e-02 -3.773247e-02
## 1-15448      -1.130339e-03  9.742431e-03
## 1-15544      1.593591e-02  2.195413e-03
## 1-15551      -1.130339e-03  9.742431e-03
## 1-15578_2    -4.752508e-03 -1.480283e-02
## 1-15611      1.206929e-01 -3.688103e-02
## 1-15628      1.556182e-03 -1.509982e-02
## 1-15660      -8.152502e-03  9.873427e-03

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## 1-15704      9.623581e-03 -4.091784e-02
## 1-15742     -1.038424e-03  1.039303e-02
## 1-15783     -3.306174e-02  2.098742e-02
## 1-15808     -1.038424e-03  1.039303e-02
## 1-15827     -3.453851e-02  2.961209e-02
## 1-15835      4.852166e-04  2.570034e-03
## 1-15876      7.103220e-03 -4.617578e-03
## 1-15876_2    -3.203158e-02 -1.907515e-02
## 1-15883     -1.775629e-02  4.769299e-03
## 1-16005      7.424992e-02  4.313126e-03
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## 1-16033     -1.291737e-02  1.065975e-02
## 1-16127      4.644294e-02 -4.119415e-02
## 1-16233      3.903270e-02 -3.682225e-02
## 1-16267     -5.158077e-03 -1.609748e-02
## 1-16272      1.302085e-02  4.665840e-03
## 1-16295     -1.030978e-02  2.305778e-02
## 1-16305      1.769726e-03  3.640084e-03
## 1-16318     -1.648676e-02  2.352878e-02
## 1-16349      1.456290e-03 -2.406909e-03
## 1-16423      1.456290e-03 -2.406909e-03
## 1-16448      1.965719e-02 -1.321912e-03
## 1-16473      3.476584e-04  7.544334e-04
## 1-16483      4.130996e-03  3.776675e-04
## 1-16491      1.946196e-03 -6.701962e-03
## 1-16499      8.379990e-03 -2.093660e-03
## 1-16550      2.333224e-02  4.521734e-02
## 1-16583     -5.985286e-03  5.303550e-02
## 1-16609     -4.866816e-03 -1.526119e-02
## 1-16769     -9.266113e-03  1.154009e-02
## 1-16866      6.783065e-03  1.946436e-02
## 1-16879      3.135046e-03 -1.715254e-03
## 1-16926     -1.385400e-02  1.735875e-02
## 1-16942      1.362778e-02  8.507159e-03
## 1-16965      1.382075e-02  5.270666e-03
## 1-16983     -2.687598e-02  2.423088e-02
## 1-17003      1.804560e-02  8.288638e-03
## 1-17051     -6.058319e-03  5.810484e-03
## 1-17102      1.992011e-02  9.233074e-03
## 1-17136     -9.472201e-04 -2.318952e-02
## 1-17163      4.644294e-02 -4.119415e-02
## 1-17318     -3.955684e-03 -1.385236e-02
## 1-17351      3.160246e-03 -1.200320e-03
## 1-17363     -2.716510e-02 -2.896527e-02
## 1-17434     -2.782793e-02 -4.286613e-03
## 1-17436     -2.608990e-02  6.804135e-03
## 1-17511      1.979993e-02  9.292988e-03
## 1-17619      1.561260e-02  5.784980e-03
## 1-17622      2.428389e-02  4.417033e-02
## 1-17632     -4.255488e-03  2.745095e-02
## 1-17675      1.999217e-02 -5.147057e-02
## 1-17771     -3.043015e-03 -1.819941e-02
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## 1-17890     -1.845723e-02  4.010909e-02

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## 1-17919      1.784796e-02  3.008642e-03
## 1-17926      -6.075434e-03 -7.289554e-02
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## 1-18030      -2.479578e-02  2.237911e-02
## 1-18047      5.566448e-03 -5.769905e-03
## 1-18114      2.042151e-02  1.069094e-02
## 1-18133      -1.721810e-02  2.065681e-03
## 1-18164      5.730507e-03 -2.138632e-03
## 1-18199      -2.948999e-02 -4.154050e-02
## 1-18226      2.027731e-03 -1.304393e-02
## 1-18231      1.148253e-02  7.270870e-03
## 1-18269      -2.678025e-02  2.150168e-02
## 1-18286      1.749047e-02  9.271726e-03
## 1-18369      2.322639e-02  8.260399e-03
## 1-18417      4.932151e-03  1.180113e-04
## 1-18428      8.857455e-03 -2.109748e-02
## 1-18438      1.451171e-03 -2.954735e-03
## 1-18489      -4.155570e-02 -6.699759e-03
## 1-18490      -9.769124e-03 -3.415626e-02
## 1-18519      2.975516e-02  1.373319e-02
## 1-18560      -9.250255e-03 -3.139957e-02
## 1-18597      2.727355e-03 -1.734071e-03
## 1-18615      1.293882e-02  7.512821e-03
## 1-18623      -6.991132e-03  5.010838e-02
## 1-18658      2.027731e-03 -1.304393e-02
## 1-18665      2.039599e-03 -3.076138e-02
## 1-18695      7.969303e-03  7.230519e-02
## 1-18721      1.670246e-03 -1.253823e-02
## 1-18774      -2.716510e-02 -2.896527e-02
## 1-18813      -2.744482e-02 -1.454818e-02
## 1-18827      1.225338e-02  2.722900e-02
## 1-18862      -1.597069e-02  2.488607e-02
## 1-18929      1.451171e-03 -2.954735e-03
## 1-18943      -2.744482e-02 -1.454818e-02
## 1-19028      -7.381133e-03 -4.999591e-03
## 1-19057      -2.027659e-02 -6.862847e-03
## 1-19062      -1.400895e-03  4.945046e-03
## 1-19081      2.215452e-03  5.472370e-03
## 1-19087      -1.687949e-02  4.648869e-02
## 1-19135      -9.761621e-03  3.356111e-03
## 1-19143      2.428751e-04 -6.717894e-03
## 1-19179      -2.756082e-02 -4.574595e-04
## 1-19213      -1.962594e-02  2.875659e-02
## 1-19243      -1.181789e-03 -8.729368e-03
## 1-19251      -2.404334e-02 -9.216814e-03
## 1-19347      -2.337256e-02 -8.717564e-03
## 1-19412      -1.447913e-02  4.162068e-02
## 1-19432      -2.795627e-03  8.007354e-03
## 1-19544      8.711937e-04 -5.640906e-03
## 1-19546      1.577980e-02  5.397157e-03
## 1-19590      -1.022718e-02  1.122821e-02
## 1-19617      -1.367290e-02  3.716042e-02

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## 1-19702      7.886441e-02 -4.000253e-02
## 1-19704      -2.948999e-02 -4.154050e-02
## 1-19704_2    1.210902e-02 -4.922494e-03
## 1-19734      4.003966e-03 -8.053276e-04
## 1-19818      5.422974e-04 -1.167653e-02
## 1-19864      1.152769e-02  2.229035e-03
## 1-19898      -6.996331e-03 5.782511e-02
## 1-19932      -1.071250e-02 3.446165e-02
## 1-19985      -2.415715e-02 -2.632744e-02
## 1-20027      -1.951230e-02 8.480979e-04
## 1-20037      -2.927793e-02 3.614491e-02
## 1-20102      -1.367290e-02 3.716042e-02
## 1-20136      -2.406694e-02 -4.388628e-03
## 1-20184      3.709394e-02 8.540641e-03
## 1-20220      1.081981e-02 1.866020e-02
## 1-20238      -9.216695e-03 -3.924780e-03
## 1-20241      1.421593e-02 2.727836e-02
## 1-20260      1.110800e-02 3.322665e-03
## 1-20282      4.433353e-03 -2.480918e-02
## 1-20300      -1.826452e-02 3.766476e-02
## 1-20348      -2.157722e-02 -2.199694e-02
## 1-20357      -1.834190e-02 1.045058e-03
## 1-20423      -4.408237e-02 -3.690581e-02
## 1-20431      3.857821e-03 -5.929510e-04
## 1-20460      5.658912e-05 9.836200e-04
## 1-20475      -6.615771e-03 1.122003e-02
## 1-20490      -7.860006e-03 4.999853e-03
## 1-20613      -2.948999e-02 -4.154050e-02
## 1-20628      -4.916727e-03 7.129648e-03
## 1-20629      -2.991640e-02 -2.868694e-03
## 1-20641      -1.710320e-03 -1.132184e-02
## 1-20688      9.607386e-03 1.150281e-02
## 1-20700      -4.644122e-05 -6.560884e-02
## 1-20733      -8.871133e-03 -5.469764e-03
## 1-20789      5.249284e-04 8.611411e-03
## 1-20840      -3.078766e-03 -1.188790e-02
## 1-20860      3.618321e-02 -1.929860e-02
## 1-20872      -8.224524e-03 6.123787e-02
## 1-20911      -1.574587e-03 -1.152845e-02
## 1-21038      1.170992e-02 4.125234e-02
## 1-21041      -1.283640e-02 2.603781e-02
## 1-21057      -7.470764e-03 -5.910351e-03
## 1-21102      -1.347034e-02 1.552708e-02
## 1-21117      -3.204613e-03 -1.890150e-02
## 1-21144      -7.426903e-03 -1.639921e-02
## 1-21200      -2.468591e-02 -8.657222e-03
## 1-21217      1.809637e-03 -2.303766e-02
## 1-21266      2.991482e-02 2.466433e-02
## 1-21437      1.107264e-03 -1.531634e-02
## 1-21492      -4.953955e-02 -3.513039e-02
## 1-21551      -1.546013e-02 4.122564e-02
## 1-21585      -6.728950e-03 -2.726644e-03
## 1-21624      1.107264e-03 -1.531634e-02
## 1-21645      2.146088e-03 1.502131e-02

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## 1-21867      -1.664417e-03 -1.524065e-02
## 1-21901      -4.438669e-03 -2.735706e-02
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## 1-22012      1.997859e-02  4.984281e-03
## 1-22015      -1.827636e-02  4.687172e-02
## 1-22022      -2.889351e-02  -3.008626e-02
## 1-22118      4.818934e-02  -1.788821e-02
## 1-22145      1.329514e-02  -4.329837e-02
## 1-22208      -6.085238e-03  1.730505e-03
## 1-22217      7.310783e-03  -1.082772e-02
## 1-22242      -9.919860e-03  -1.195016e-02
## 1-22317      -8.990814e-02  -3.420711e-02
## 1-22406      7.040807e-04  -5.291508e-03
## 1-22434      1.135329e-02  2.459075e-03
## 1-22449      -8.990814e-02  -3.420711e-02
## 1-22493      1.238590e-03  -7.038550e-03
## 1-22494      2.827445e-03  -1.157486e-02
## 1-22696      -6.659134e-02  -3.924547e-02
## 1-22760      1.143764e-03  -2.740087e-02
## 1-22789      4.474557e-04  -4.636831e-03
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## 1-22842      -1.472755e-03  -1.881648e-02
## 1-22902      -8.205105e-02  8.066614e-03
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## 1-22933      -1.598311e-02  6.842818e-04
## 1-22964      9.046026e-03  -3.521659e-03
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## 1-23017      1.601549e-02  5.997603e-03
## 1-23021      -1.267096e-02  -1.061401e-02
## 1-23053      2.024404e-02  4.519604e-03
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## 1-23123      -4.112254e-03  2.311409e-03
## 1-23163      4.027453e-03  -1.115946e-02
## 1-23234      -1.668018e-02  3.315848e-02
## 1-23236      1.670977e-02  -2.255835e-02
## 1-23278      -3.595532e-02  -2.338393e-02
## 1-23285      9.148099e-02  -3.677239e-02
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## 1-23407      -1.354166e-02  -7.915744e-03
## 1-23417      1.377019e-02  3.296094e-03
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## 1-23495      2.955026e-02  1.122583e-02
## 1-23497      -4.071132e-02  -2.879646e-02
## 1-23551      -3.214056e-02  -3.680817e-02
## 1-23564      -1.354166e-02  -7.915744e-03
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## 1-23590_2     -1.593588e-02  1.278223e-03
## 1-23605      1.405192e-02  -1.079285e-02
## 1-23650      -3.961833e-02  -3.633771e-02
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## 1-23775 -3.214056e-02 -3.680817e-02
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## 1-23848 -6.652825e-03 5.060131e-02
## 1-23870 -6.478749e-03 1.260977e-02
## 1-23883 9.499922e-02 -4.250551e-02
## 1-23884 -5.115891e-03 2.559567e-03
## 1-23915 -5.342658e-02 -3.669245e-02
## 1-23971 -8.124804e-03 -1.214605e-03
## 1-24008 -3.372514e-02 -3.347267e-02
## 1-24079 4.290004e-02 -4.513980e-02
## 1-24117 -2.004567e-02 2.961816e-02
## 1-24132 1.879849e-02 -1.540338e-03
## 1-24141 -2.684266e-03 -6.757462e-03
## 1-24179 2.663759e-02 3.251298e-02
## 1-24285 -2.684266e-03 -6.757462e-03
## 1-24285_2 1.048650e-02 5.404384e-03
## 1-24328 1.968919e-02 -4.448401e-04
## 1-24379 2.196080e-03 9.448437e-03
## 1-24422 -1.377263e-02 -1.440645e-02
## 1-24576 3.049063e-02 2.940955e-02
## 1-24619 -6.466875e-02 -3.200062e-02
## 1-24623 -8.747830e-03 1.336250e-02
## 1-24630 -3.083076e-02 6.866860e-03
## 1-24659 1.938813e-02 7.699982e-04
## 1-24668 -6.606900e-03 5.886493e-02
## 1-24674 -2.344254e-03 -2.240559e-02
## 1-24726 2.879735e-02 3.363732e-02
## 1-24784 4.851689e-04 -4.823172e-03
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## 1-25161 -3.088759e-05 -3.559310e-03
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## 1-25266 9.884142e-03 4.884074e-03
## 1-25269 -1.680904e-02 -1.363870e-02
## 1-25289 -6.809290e-02 -3.179521e-02
## 1-25324 1.031299e-01 -2.194635e-02
## 1-25363 -5.460637e-03 1.044103e-04
## 1-25376 2.954193e-03 6.907190e-03
## 1-25392 -1.603285e-02 4.709351e-02
## 1-25424 -6.765504e-04 -2.799583e-02
## 1-25577 -9.149692e-02 -3.049140e-02
## 1-25729 1.424734e-02 2.527756e-03
## 1-25868 -2.201423e-02 -2.768969e-02
## 1-25982 1.769645e-02 1.195385e-02
## 1-26017 9.292314e-03 7.266813e-03
## 1-26044 -1.526488e-03 -2.965513e-02
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## 1-26350      -3.569873e-03  1.054612e-03
## 1-26383      2.047347e-02  5.388544e-03
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## 1-26462      -2.196341e-02  1.487369e-05
## 1-26466      -1.357406e-03  -1.264684e-02
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## 1-26593      1.143569e-02  9.210349e-03
## 1-26595      5.019562e-03  4.109094e-03
## 1-26617      -1.329580e-02  -2.439421e-04
## 1-26618      -8.035368e-03  -4.941190e-03
## 1-26674      3.421246e-03  1.504620e-02
## 1-26746      -7.253642e-03  1.987526e-03
## 1-26771      6.789187e-03  -5.513667e-03
## 1-26799      4.249542e-04  3.013909e-03
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## 1-26881      8.578467e-03  1.225318e-02
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## 1-27085      4.400994e-05  2.146436e-02
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## 1-27118      4.249542e-04  3.013909e-03
## 1-27136      -3.978945e-03  1.141079e-02
## 1-27155      5.022427e-03  1.520932e-02
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## 1-27268      2.794681e-02  6.410177e-03
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## 1-27492      7.046755e-03  2.413540e-02
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## 1-27612      5.505402e-03  3.817614e-03
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## 1-27727      5.037749e-03  5.778327e-04
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## 1-27839      -1.954918e-02  1.436123e-03
## 1-27849      -3.397816e-02  7.693853e-02
## 1-27894      -4.296790e-02  3.625628e-03
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## 1-28134      5.398139e-03  -2.422832e-03
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## 1-28187      -1.580714e-02  3.384595e-02
## 1-28198      2.142789e-04  -2.440384e-03
## 1-28247      -8.513310e-04  -3.431025e-03
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## 1-28453      -8.513310e-04  -3.431025e-03
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## 1-28501      -1.458277e-02  1.818031e-02
## 1-28553      -4.024541e-04  -4.268071e-03
## 1-28567      1.436282e-02  -8.040994e-03
## 1-28577      1.081779e-02  5.384847e-05
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## 1-28627      -2.361415e-02  -1.608098e-02
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## 1-29173      9.345728e-03  1.843574e-02
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## 1-29793      -5.228357e-03  -9.425430e-04
## 1-29867      -2.991486e-02  -2.219524e-02
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## 1-30311      -3.528221e-02 -6.981465e-04
## 1-30361      -4.793214e-02 -3.387622e-04
## 1-30381      1.449072e-02 -7.895557e-03
## 1-30513      1.157723e-02 -7.611503e-03
## 1-30539      7.882001e-03  2.002261e-02
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## 1-30926      -4.190659e-02 -7.439117e-03
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## 1-31001      3.616526e-03  2.172670e-02
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## 1-31083      2.480328e-02  1.223232e-02
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## 1-31144      -1.800357e-02  5.131832e-02
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## 1-31269      -4.395788e-02  4.995175e-03
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## 1-31694      8.653468e-02 -3.997736e-02
## 1-31726      -1.610533e-02  1.017624e-02
## 1-31766      -5.103187e-03 -9.249216e-03
## 1-31797      -2.104793e-04 -5.285977e-03
## 1-31883      -4.084354e-02 -7.701444e-03
## 1-31888      -6.588853e-03  1.033152e-02
## 1-31898      -4.642678e-02 -5.242752e-02
## 1-31915      1.553377e-02  3.741901e-03
## 1-31946      1.550813e-02 -8.416204e-03
## 1-31960      -2.486379e-02  6.744155e-03
## 1-32024      -3.668042e-02 -1.582861e-02
## 1-32035      5.253541e-03  7.669634e-04

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## 1-32056      -3.482854e-03 -7.288524e-04
## 1-32089      1.179396e-02  4.641105e-03
## 1-32100      3.162389e-02  -1.701535e-03
## 1-32127      -6.926851e-02  1.381107e-03
## 1-32142      3.495576e-02  -3.511616e-02
## 1-32194      -1.043230e-01  -1.592604e-02
## 1-32273      -1.514390e-03  -3.190598e-02
## 1-32345      2.201881e-03  -2.905139e-03
## 1-32353      3.692249e-02  -4.252640e-02
## 1-32408      -3.963959e-02  -4.261404e-03
## 1-32418      1.710284e-02  2.514246e-03
## 1-32545      4.037255e-04  7.762059e-03
## 1-32546      2.812365e-02  1.069552e-02
## 1-32643      -3.444733e-02  -2.288898e-03
## 1-32654      2.713714e-02  1.032487e-02
## 1-32655      -2.959492e-03  -3.255115e-02
## 1-32687      4.197558e-02  1.138693e-02
## 1-32699      -4.733627e-02  4.223113e-03
## 1-32705      -2.037176e-02  8.472066e-03
## 1-32721      1.309603e-02  2.182895e-03
## 1-32730      3.495576e-02  -3.511616e-02
## 1-32831      -1.053558e-03  -3.451088e-03
## 1-32845      4.685503e-03  -3.847440e-03
## 1-32869      3.486497e-04  1.061897e-02
## 1-32915      4.685503e-03  -3.847440e-03
## 1-32962      -5.246081e-03  -2.049678e-02
## 1-32968      3.948877e-03  2.839199e-02
## 1-33027      -1.940565e-02  7.736961e-03
## 1-33032      4.138000e-03  1.461376e-02
## 1-33035      -1.060049e-03  -5.016645e-03
## 1-33064      -3.993097e-02  -4.055978e-03
## 1-33071      -6.534980e-03  -4.112334e-03
## 1-33087      3.932340e-02  -3.008508e-03
## 1-33092      -1.394276e-02  8.783784e-03
## 1-33165      9.472791e-03  6.467838e-03
## 1-33245      4.177945e-02  -5.322951e-02
## 1-33274      -7.058684e-03  -1.463087e-02
## 1-33291      3.756796e-02  -1.982389e-03
## 1-33302      -7.058684e-03  -1.463087e-02
## 1-33337      -5.570756e-02  -3.554254e-03
## 1-33345      3.985824e-02  -1.390529e-02
## 1-33351      8.273513e-03  3.263073e-03
## 1-33374      3.985824e-02  -1.390529e-02
## 1-33416      7.250254e-03  5.245036e-03
## 1-33432      3.591784e-03  6.561650e-04
## 1-33442      -2.462179e-02  -1.929139e-02
## 1-33458      1.590213e-02  6.761335e-03
## 1-33499      1.856175e-02  3.240550e-02
## 1-33540      1.021076e-02  6.016131e-03
## 1-33551      -1.566986e-02  -4.831692e-02
## 1-33615      -3.658805e-02  -3.920903e-03
## 1-33663      4.177945e-02  -5.322951e-02
## 1-33728      7.219534e-04  -6.198675e-03
## 1-33744      1.541743e-02  -8.054012e-03

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## 1-33829 -1.030374e-03 -2.002420e-02
## 1-33893 -2.051688e-03 7.860731e-03
## 1-33895 1.195792e-02 5.319151e-03
## 1-33941 -1.030374e-03 -2.002420e-02
## 1-34021 -1.584133e-02 -7.189049e-03
## 1-34022 -9.969970e-03 2.312819e-02
## 1-34034 1.694362e-02 2.705536e-03
## 1-34088 8.092887e-03 2.918872e-03
## 1-34141 3.495576e-02 -3.511616e-02
## 1-34161 -8.175227e-03 2.853348e-03
## 1-34217 2.176759e-02 2.524387e-04
## 1-34222 1.105500e-03 -2.862464e-03
## 1-34223 -1.797029e-01 3.142478e-02
## 1-34263 1.541743e-02 -8.054012e-03
## 1-34273 -7.300808e-03 -1.515701e-02
## 1-34390 9.472791e-03 6.467838e-03
## 1-34576 1.239308e-02 5.484852e-03
## 1-34654 8.817991e-03 3.309816e-03
## 1-34680 -3.665127e-02 6.853967e-05
## 1-34687 -1.865402e-02 -1.462256e-02
## 1-34727 -5.993731e-03 -1.611494e-02
## 1-34731 3.054443e-02 -1.504014e-02
## 1-34737 2.993015e-02 -1.878905e-02
## 1-34851 8.817991e-03 3.309816e-03
## 1-34856 3.397019e-02 -3.442252e-02
## 1-34860 9.746408e-03 1.600821e-03
## 1-34924 2.429913e-02 -2.989261e-02
## 1-34939 1.186911e-02 3.214148e-03
## 1-34986 2.429913e-02 -2.989261e-02
## 1-34987 3.912949e-03 1.460061e-02
## 1-34989 -9.015628e-03 -6.060484e-02
## 1-35012 1.549730e-03 5.171227e-03
## 1-35022 2.170461e-02 -4.078710e-02
## 1-35041 3.087777e-02 -1.680042e-02
## 1-35058 1.741814e-03 -2.322762e-02
## 1-35064 1.608603e-02 2.762945e-03
## 1-35079 7.282418e-02 2.034391e-02
## 1-35119 -2.387689e-02 -1.258116e-02
## 1-35132 -2.571719e-02 1.240428e-02
## 1-35173 -3.389969e-02 -2.272139e-02
## 1-35210 1.747315e-02 1.639814e-02
## 1-35344 -2.497292e-02 -2.909488e-02
## 1-35368 -7.300808e-03 -1.515701e-02
## 1-35410 -2.073149e-03 8.929434e-03
## 1-35413 -2.387689e-02 -1.258116e-02
## 1-35423 -2.173542e-03 -9.077956e-03
## 1-35437 -6.825336e-03 -2.703532e-02
## 1-35442 -2.571719e-02 1.240428e-02
## 1-35448 6.966136e-02 2.784715e-03
## 1-35538 8.961927e-03 -1.514162e-03
## 1-35560 3.742328e-03 1.761876e-03
## 1-35586 -5.188946e-03 1.002577e-02
## 1-35607 -1.439457e-02 -1.649246e-02
## 1-35651 -1.120084e-03 3.736800e-02

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## 1-35663      4.777807e-03 -2.709198e-03
## 1-35792      7.399511e-03 -1.061788e-03
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## 1-35916      -9.978694e-03  2.094023e-02
## 1-35965      -2.563728e-02  2.831049e-05
## 1-35996      -7.729069e-03  3.672838e-02
## 1-36122      1.031315e-03 -3.191532e-03
## 1-36131      -1.748320e-02  9.710522e-04
## 1-36133      3.642021e-02 -3.395816e-02
## 1-36237      1.026966e-01  3.300623e-03
## 1-36278      -3.451317e-02 -2.365579e-02
## 1-36383      7.458446e-02 -4.964035e-02
## 1-36392      5.121650e-03 -4.754789e-03
## 1-36428      -2.457242e-02 -2.758431e-02
## 1-36430      -1.439457e-02 -1.649246e-02
## 1-36451      7.568995e-04 -3.279612e-03
## 1-36485      2.181249e-02  3.619298e-04
## 1-36497      -5.301181e-03  2.203316e-03
## 1-36497_2    -4.147915e-04 -6.892529e-03
## 1-36499      3.320417e-03  2.094753e-02
## 1-36507      9.156580e-03 -2.829774e-02
## 1-36525      2.181249e-02  3.619298e-04
## 1-36540      -2.775587e-02 -6.051965e-03
## 1-36586      3.642021e-02 -3.395816e-02
## 1-36599      -1.753414e-04  2.252127e-02
## 1-36663      -3.032416e-02 -1.969709e-02
## 1-36712      -5.425607e-03  4.312380e-03
## 1-36719      1.201270e-02  2.473253e-02
## 1-36754      3.452472e-03 -1.315046e-05
## 1-36768      3.559125e-03  1.351611e-03
## 1-36820      3.559125e-03  1.351611e-03
## 1-36822      1.309740e-02 -2.690495e-03
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## 1-36956      2.719730e-03 -1.089057e-02
## 1-37031      -1.761951e-03  1.577063e-03
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## 1-37046      1.072583e-02 -2.977256e-02
## 1-37064      -6.797321e-03  1.386539e-02
## 1-37074      -2.298020e-02  1.444729e-02
## 1-37089      -1.089793e-02  1.520704e-02
## 1-37115      9.944644e-03 -3.392164e-03
## 1-37138      -1.058361e-02  6.047504e-03
## 1-37255      7.166435e-03 -1.104980e-03
## 1-37263      1.503370e-02 -3.605066e-03
## 1-37298      8.311165e-04 -2.170872e-02
## 1-37356      7.779049e-03 -1.123560e-03
## 1-37392      5.788910e-03 -1.976197e-03
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## 1-37417      -7.323661e-03 -3.026546e-02
## 1-37440      1.811875e-02 -4.091103e-02
## 1-37459      -8.845439e-03  2.435681e-02
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## 1-37558      -3.875518e-03 -2.443880e-02

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## 1-37590      8.972396e-04 -1.769357e-03
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## 1-37746      -1.880834e-03 -9.241608e-03
## 1-37757      -2.701359e-02  3.373070e-03
## 1-37788      -2.630540e-02 -1.659642e-02
## 1-37898      2.737515e-02  4.458852e-03
## 1-37957      -4.422469e-02 -1.729535e-03
## 1-37963      -6.920342e-03  8.570937e-03
## 1-38021      -2.988437e-02 -4.622832e-03
## 1-38085      1.589492e-02 -4.747223e-04
## 1-38117      7.755837e-04 -6.445081e-03
## 1-38120      -1.244511e-02  6.297823e-03
## 1-38173      -3.678568e-02 -8.739540e-03
## 1-38253      6.705980e-03  5.632289e-03
## 1-38311      8.972396e-04 -1.769357e-03
## 1-38450      4.158240e-02  6.542417e-03
## 1-38472      -3.311081e-02  1.790898e-02
## 1-38475      5.878830e-03  1.625536e-03
## 1-38495      -4.322293e-04  7.462088e-03
## 1-38496      -3.353243e-02 -1.575260e-03
## 1-38503      8.929941e-03  1.116444e-02
## 1-38611      -2.733775e-03  3.179344e-02
## 1-38620      1.401474e-03 -8.597574e-04
## 1-38696      1.401474e-03 -8.597574e-04
## 1-38748      2.781688e-02  4.830447e-03
## 1-38797      4.376345e-03  7.431353e-03
## 1-38800      -1.254505e-02 -4.416137e-02
## 1-38823      -2.702677e-02 -2.246077e-02
## 1-39027      -3.008845e-03  3.144380e-02
## 1-39077      -2.395236e-02 -6.523181e-03
## 1-39120      7.965067e-03  3.922847e-03
## 1-39145      4.444064e-03  6.947745e-03
## 1-39154      -9.290601e-03  2.769319e-02
## 1-39159      2.104070e-02 -6.430333e-03
## 1-39182      2.452643e-03  1.049327e-02
## 1-39213      2.180169e-02  4.032029e-03
## 1-39241      1.913468e-03 -7.085384e-03
## 1-39248      4.444064e-03  6.947745e-03
## 1-39294      1.986106e-02 -5.642957e-03
## 1-39298      -9.058945e-03  5.689926e-04
## 1-39337      -1.392354e-02  3.788105e-03
## 1-39391      1.452230e-02  4.887239e-03
## 1-39400      4.340501e-02 -3.272506e-02
## 1-39423      -3.781306e-03  2.424639e-02
## 1-39429      1.452230e-02  4.887239e-03
## 1-39471      1.364212e-02 -1.348445e-02
## 1-39544      -4.248219e-02 -8.315368e-03
## 1-39576      -6.800678e-03 -1.413757e-02
## 1-39642      8.325131e-02 -4.082406e-02
## 1-39648      -4.807067e-02 -3.207547e-02
## 1-39714      -1.612724e-02  3.888143e-02
## 1-39753      4.644294e-02 -4.119415e-02
## 1-39839      8.576274e-02 -3.326377e-04

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## 1-39890      -2.556625e-02  1.155493e-02
## 1-39896      -8.073623e-03  1.551559e-02
## 1-39936      -4.681036e-03  -5.908285e-02
## 1-39936_2    2.025856e-03  -8.629143e-04
## 1-40112      1.340165e-02   2.269311e-02
## 1-40179      -2.998378e-03  -7.161401e-03
## 1-40185      -1.310319e-02  2.658390e-03
## 1-40191      1.762301e-02   5.221084e-03
## 1-40242      -9.253670e-03  -2.229936e-02
## 1-40282      3.143752e-02   -2.938305e-02
## 1-40286      5.510760e-03   -3.080273e-03
## 1-40288      1.762301e-02   5.221084e-03
## 1-40311      -1.117342e-02  5.247423e-02
## 1-40380      4.871261e-03   -2.932332e-03
## 1-40424      1.426910e-02   4.339647e-03
## 1-40538      1.818405e-02   4.055230e-03
## 1-40549      -4.001901e-03  -1.229847e-02
## 1-40568      -1.161455e-03  -5.263494e-03
## 1-40578      2.296661e-02   -2.049024e-03
## 1-40613      5.878830e-03   1.625536e-03
## 1-40622      -1.548660e-02  3.617737e-03
## 1-40682      8.576274e-02   -3.326377e-04
## 1-40702      1.604962e-02   2.612003e-03
## 1-40720      -8.797660e-03  -3.083311e-03
## 1-40765      -2.669525e-02  -1.428595e-02
## 1-40774      2.050961e-03   -2.116327e-03
## 1-40784      -2.618353e-02  -2.590102e-02
## 1-40785      2.869692e-02   -1.222531e-02
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## 1-40873      4.607590e-02   -5.659380e-02
## 1-40935      -2.155991e-02  -9.177052e-04
## 1-40956      -2.465244e-02  2.145418e-02
## 1-41079      2.638966e-02   7.449550e-03
## 1-41253      -2.642519e-02  1.400209e-02
## 1-41254      2.006327e-03   -1.512577e-03
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## 1-41258      1.420559e-03   -8.514163e-03
## 1-41293      -4.800187e-02  -4.514850e-02
## 1-41309      4.563187e-02   -1.695449e-02
## 1-41352      1.111998e-04   2.879360e-02
## 1-41420      -2.136072e-02  7.124887e-03
## 1-41442      -1.965940e-02  2.812957e-04
## 1-41529      1.299116e-02   1.555884e-02
## 1-41663      8.933026e-03   2.720269e-02
## 1-41691      -4.896165e-03  -1.421225e-02
## 1-41744      1.293251e-02   1.141561e-03
## 1-41747      -4.717548e-02  -4.351564e-02
## 1-41771      -2.669606e-02  -2.828832e-02
## 1-41773      3.232740e-03   1.294841e-02
## 1-41777      -2.893270e-02  -6.900595e-03
## 1-41801      -1.167004e-02  3.024432e-03
## 1-41832      -9.538532e-03  1.751104e-03
## 1-41892      1.200642e-02   1.600845e-02
## 1-41900      3.275747e-04   7.235250e-03

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## 1-42024      -3.653382e-03 -8.752595e-03
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## 1-42298       6.338085e-02 -4.375527e-02
## 1-42331       6.348860e-03  2.285928e-02
## 1-42408      -1.059424e-02 -4.116454e-02
## 1-42527       1.566799e-02 -8.070494e-03
## 1-42612       1.096010e-02  2.517526e-02
## 1-42727       5.641191e-03 -8.880686e-03
## 1-42762      -1.707556e-02 -5.948561e-02
## 1-42764       5.667382e-03 -9.002876e-03
## 1-42799       1.459546e-02  1.721357e-02
## 1-42852       1.510380e-02 -1.464875e-03
## 1-42903       6.550069e-02 -6.944157e-02
## 1-42904      -1.712539e-02 -6.031654e-02
## 1-42956       1.239678e-02  2.210431e-02
## 1-43108       2.214144e-02 -2.135967e-03
## 1-43114       1.238859e-02  3.677283e-03
## 1-43117      -2.903977e-02 -3.904619e-02
## 1-43134      -2.801191e-02 -7.576006e-02
## 1-43146       1.726526e-02  3.558737e-03
## 1-43149      -8.135593e-03 -3.403239e-03
## 1-43167       9.461507e-05  6.517401e-03
## 1-43217       7.867160e-04 -6.914138e-03
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## 1-43350      -4.540403e-03 -1.013393e-02
## 1-43377       1.859846e-02  3.623111e-03
## 1-43391      -2.986300e-02  3.436944e-02
## 1-43498       1.864889e-03  2.346560e-03
## 1-43583      -1.088652e-02 -1.544352e-02
## 1-43593       8.383052e-02  1.137573e-03
## 1-43623       2.808476e-03 -5.339467e-03
## 1-43655       1.140552e-02  2.305689e-02
## 1-43774       3.906929e-02 -3.346758e-02
## 1-43776      -5.523099e-03 -1.239748e-02
## 1-43854       1.622021e-03  2.785517e-03
## 1-43862       1.908349e-03  2.705034e-02
## 1-43888      -2.518826e-02  1.010489e-02
## 1-43894      -1.088652e-02 -1.544352e-02
## 1-43955       7.478663e-03 -2.264928e-03
## 1-44137       1.881095e-02 -1.733443e-02
## 1-44178      -3.164440e-02 -1.838829e-02
## 1-44179      -1.087418e-02 -1.586801e-02
## 1-44214       3.139864e-02  1.095015e-02
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## 1-44370      -4.431511e-02 -1.480537e-02
## 1-44386      -1.655944e-02  2.072211e-02
## 1-44407      -1.240212e-03 -1.868588e-03
## 1-44438       8.000150e-03  1.616891e-02
## 1-44474       6.081386e-03 -2.922904e-03
## 1-44491       7.347088e-02 -2.890357e-02
## 1-44541       6.090107e-02 -5.229237e-02
## 1-44751      -6.309586e-03  5.434442e-03
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## 1-44816      -6.945506e-03  1.478509e-02

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## 1-44916      9.654717e-03  2.396333e-02
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## 1-44988      -2.232907e-02  5.304977e-02
## 1-45075      1.960808e-02  5.951448e-02
## 1-45083      -1.991418e-03  -1.794167e-02
## 1-45120      -7.001291e-03  -4.195186e-02
## 1-45122      -2.116543e-02  1.816633e-03
## 1-45136      -5.067303e-03  -1.731956e-02
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## 1-45311      1.305114e-02  -1.127853e-03
## 1-45367      -3.045665e-02  -2.787065e-02
## 1-45419      -2.161521e-02  -1.955554e-02
## 1-45433      -2.116543e-02  1.816633e-03
## 1-45469      -7.322779e-03  4.304059e-04
## 1-45503      -2.246995e-03  -2.180277e-03
## 1-45555      3.531959e-02  -1.526830e-02
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## 1-45618      8.156184e-03  -6.836579e-03
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## 1-45704      4.419898e-02  -4.362587e-02
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## 1-45786      -6.843862e-03  4.932228e-02
## 1-45788      1.830800e-03  -1.228289e-03
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## 1-45883      -2.389367e-02  -1.918151e-02
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## 1-46003      3.034050e-03  -5.762704e-03
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## 1-46049      -2.156021e-03  5.628668e-03
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## 1-46248      1.181554e-02  -7.129082e-03
## 1-46257      -4.943610e-03  -2.848476e-04
## 1-46260      -5.849579e-04  -1.260583e-02
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## 1-46523      -3.076543e-03  -9.969994e-03

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## 1-46612 -6.026250e-03 -1.352693e-02
## 1-46615 -3.949424e-02 -1.956705e-02
## 1-46647 -1.458277e-02 1.818031e-02
## 1-46719 -6.368903e-04 -9.930997e-03
## 1-46737 1.191064e-03 6.917472e-03
## 1-46784 8.019853e-02 3.529200e-03
## 1-46818 1.330482e-02 -9.373644e-03
## 1-46828 -1.610345e-02 3.138463e-02
## 1-46832 -4.655752e-03 2.120929e-03
## 1-46842 1.140203e-02 3.199019e-03
## 1-46888 -2.807106e-04 -1.615104e-02
## 1-46919 8.019853e-02 3.529200e-03
## 1-46932 -2.562418e-02 3.858674e-02
## 1-46951 -2.201908e-02 -7.771478e-03
## 1-46958 3.502495e-02 4.609028e-02
## 1-46971 5.096764e-02 -1.603874e-02
## 1-46972 -2.931192e-02 -1.005774e-02
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## 1-46995 1.194323e-02 3.300972e-03
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## 1-47115 -3.753363e-02 -1.703216e-02
## 1-47125 -1.219562e-02 7.073534e-03
## 1-47137 -6.164493e-03 3.688082e-02
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## 1-47908 8.808385e-03 2.239029e-02
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## 1-49960      4.602536e-04 -2.844566e-03
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## 2-50801      4.228514e-02  4.252662e-02
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## 2-53142      2.687398e-03 -4.798182e-03
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## 2-53353      -9.471310e-03 -3.425984e-02
## 2-53361      -2.420068e-02  1.906387e-02
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## 2-54744      -9.430838e-03 -4.078287e-02
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## 2-56253 2.781796e-03 1.155437e-02
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## 2-57070	-8.129980e-05	1.124075e-02
## 2-57096	3.024620e-02	6.841413e-03
## 2-57104	7.150776e-03	4.748097e-02
## 2-57311	9.355361e-04	3.465479e-03
## 2-57343	1.025758e-02	2.767990e-03
## 2-57351	1.820326e-03	-1.973862e-02
## 2-57523	1.442553e-03	-6.566875e-03
## 2-57553	-5.057891e-03	-3.228366e-02
## 2-57560	-9.211630e-03	1.800573e-02
## 2-57560_2	8.056171e-03	2.315746e-02
## 2-57611	5.015828e-03	6.079598e-03
## 2-57624	1.448784e-03	-7.762205e-04
## 2-57659	1.598772e-03	-2.430897e-02
## 2-57774	2.264028e-02	-4.735937e-03
## 2-57830	-3.585187e-02	-6.542204e-03
## 2-57997	2.306266e-02	1.329998e-02
## 2-58109	1.468546e-02	-2.395478e-03
## 2-58376	1.862930e-02	-7.997250e-03
## 2-58427	2.492400e-02	9.824422e-03
## 2-58429	1.005863e-02	1.106053e-02
## 2-58457	4.465657e-02	-3.667145e-02
## 2-58466	1.075609e-02	3.930767e-03
## 2-58481	-4.580143e-03	-1.635185e-02
## 2-58566	7.384967e-03	1.778222e-03
## 2-58586	-4.586919e-02	-1.636671e-02
## 2-58598	-2.428817e-03	1.952255e-02
## 2-58629	-4.246570e-02	-2.851129e-02
## 2-58652	8.744702e-03	4.141533e-03
## 2-58696	9.590730e-03	3.047844e-03
## 2-58828	7.808492e-03	-2.063800e-03
## 2-58867	2.031235e-03	-6.055244e-03
## 2-58920	-1.297199e-01	4.253602e-02
## 2-58929	1.046219e-02	2.987060e-03
## 2-58931	-2.452377e-03	-2.035709e-04
## 2-58939	-7.094442e-03	9.317865e-03
## 2-58953	-5.362833e-04	-1.977183e-02
## 2-58978	8.473586e-03	-1.806232e-03
## 2-58999	-2.452377e-03	-2.035709e-04
## 2-59000	8.024510e-03	2.999161e-03
## 2-59004	4.764295e-03	-4.080822e-03
## 2-59039	8.024510e-03	2.999161e-03
## 2-59040	-1.627773e-02	1.172547e-02
## 2-59171	9.548834e-03	3.649546e-03
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## 2-59274	-2.979719e-02	3.338973e-02
## 2-59275	-4.433531e-03	2.203873e-02
## 2-59308	-5.778677e-03	-4.884664e-02
## 2-59323	-2.057215e-02	-2.028477e-02
## 2-59389	2.036842e-02	4.565596e-02
## 2-59394	7.187542e-03	1.920201e-02
## 2-59399	-2.190228e-02	-3.657782e-02
## 2-59425	9.632133e-03	3.940634e-03
## 2-59488	-1.591478e-02	3.286806e-02

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## 2-59581  7.787327e-03 -1.816474e-03
## 2-59629 -2.190228e-02 -3.657782e-02
## 2-59701  1.363515e-02  4.540873e-03
## 2-59722 -3.054537e-02  3.279734e-02
## 2-59805  4.640219e-02 -1.781421e-02
## 2-59863 -1.533953e-02  3.167813e-02
## 2-59864  3.206638e-02  1.574439e-02
## 2-59867 -2.515395e-04  3.345174e-03
## 2-59871  1.832110e-03 -6.842355e-03
## 2-59871_2 -2.775225e-03 -2.451194e-02
## 2-59896 -2.297370e-02 -2.167932e-02
## 2-59912  1.585348e-02  1.565722e-03
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## 2-59994 -2.325601e-02 -2.313849e-02
## 2-59999  5.274660e-02  6.508455e-03
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## 2-60242  5.140147e-02 -4.411373e-02
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## 2-60449 -3.042760e-02 -1.295321e-04
## 2-60554  8.304242e-02 -4.333426e-04
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## 2-60783 -6.524022e-03  1.894182e-03
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## 2-61343 -3.351751e-02 -6.131283e-03
## 2-61391 -7.773280e-02  5.961650e-02
## 2-61395 -6.896572e-03  1.940008e-03
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## 2-61578 -1.421937e-02 -6.896145e-03
## 2-61606 -2.480620e-03  7.098474e-03
## 2-61680  1.257471e-02  7.677782e-03
## 2-61769  2.688350e-03 -5.713829e-03
## 2-61867 -1.834627e-04  5.119319e-03
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## 2-61965  4.774189e-02 -3.968022e-02

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## 2-62065     -1.584484e-02 -9.283265e-03
## 2-62066     -4.569585e-03 -1.354256e-02
## 2-62070      1.591850e-02  3.551628e-03
## 2-62084      6.059905e-03 -1.302090e-03
## 2-62104      8.304242e-02 -4.333426e-04
## 2-62159      2.070625e-02  9.697781e-03
## 2-62190      8.304242e-02 -4.333426e-04
## 2-62276      2.731920e-02  7.330400e-03
## 2-62292     -2.316585e-02 -3.773028e-02
## 2-62293      1.326689e-02  4.394527e-02
## 2-62302      5.955670e-03 -1.226898e-03
## 2-62374     -2.548011e-03 -3.251827e-02
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## 2-62549     -2.495300e-02 -3.963348e-02
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## 2-62660     -3.626342e-02 -3.089530e-02
## 2-62673     -4.662542e-03 -1.235836e-03
## 2-62698     -1.165725e-02  3.900236e-02
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## 2-62839      1.613468e-02  2.986980e-02
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## 2-63411      1.531657e-02  8.208919e-03
## 2-63413     -3.435568e-02 -2.766742e-02
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## 2-64243      -2.625901e-03  1.122662e-03
## 2-64268      -9.349708e-03  1.458918e-02
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## 2-66675     -1.034738e-02  6.276910e-02
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## 2-66979      1.379369e-02 -5.271396e-03
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## 2-67078      5.266887e-03 -3.271538e-02
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## 2-67607      6.654082e-03 -2.781226e-02
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## 2-68181      4.604110e-02 -1.605380e-02
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## 2-68271      1.957439e-03 -4.601196e-03
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## 2-69278      -8.037916e-03  -1.713328e-02
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## 2-69679      -1.816325e-02  -1.043819e-02
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## 2-70057      1.377776e-02  7.311007e-03
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## 2-70328      1.652330e-03  -1.578070e-03

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## 2-82192      1.858541e-03  2.566895e-03
## 2-82399      3.932864e-03  3.174839e-04
## 2-82422      -3.648330e-03  4.068299e-03
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## 2-82455_3    1.893110e-02  8.765459e-03
## 2-82482      1.194032e-02  5.148742e-03
## 2-82569      -3.156157e-02  2.405631e-03
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## 2-83495      5.562337e-04 -1.864426e-02
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## 2-83871      9.419140e-02 -1.889610e-02
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## 2-83924      -2.127953e-02 -1.038090e-02
## 2-83940      -2.235193e-02 -1.833537e-02
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## 2-84003      1.747287e-02  6.573289e-03

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## 2-84415     -4.016467e-02 -7.580274e-03
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## 2-85406     -2.869012e-02 -1.372690e-02
## 2-85490     -2.038028e-02 -1.777936e-02
## 2-85492      2.013315e-02  3.986402e-02
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## 2-86025     -1.468217e-02  1.982547e-02
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## 2-86236      3.791200e-03  1.440775e-02
## 2-86246      7.613765e-03  -1.075004e-02
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## 2-87694     -1.309712e-02  2.272415e-02
## 2-87699      5.073496e-02  -4.696166e-02
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## 2-88222     -1.183949e-02  2.222631e-02
## 2-88255      1.863082e-02  -1.600608e-02
## 2-88274     -6.717054e-03  7.423127e-04
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## 2-88905      -1.812847e-02 -1.522058e-02
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## 2-89348      -2.786102e-02  5.489304e-03
## 2-89357      2.613298e-02  2.141382e-02
## 2-89390      -8.555994e-03 -4.128402e-03
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## 2-89994      -1.641984e-02 -2.456397e-03
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## 2-90186      9.280876e-03 -4.308090e-03
## 2-90212      -6.675602e-03  1.245714e-02
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## 2-90271      2.152848e-02  6.626495e-03
## 2-90314      1.617928e-02  3.933006e-02
## 2-90347      -2.306510e-02 -8.183980e-04
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## 2-91288      -6.328861e-03 -2.244146e-02
## 2-91296      -3.446192e-02  6.556596e-02
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## 2-91467      3.832608e-03  1.215917e-02
## 2-91470      -9.354746e-03 -3.758190e-02
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## 2-91494      -1.332924e-02 -5.011582e-03
## 2-91499      2.797941e-02 -1.980651e-02
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## 2-91581      -1.937060e-02 -9.727198e-03
## 2-91583      2.521254e-02  8.053672e-03
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## 2-92874     -5.013544e-03  -3.734721e-03
## 2-92986     -1.151099e-02   9.156426e-03
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## 2-93018      1.370736e-02   6.736344e-03
## 2-93021     -2.695127e-02   5.246673e-02
## 2-93051      1.329486e-02  -4.179540e-03
## 2-93077     -3.920286e-02  -1.315843e-02
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## 2-93203      2.573170e-03   9.904588e-03
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## 2-93930     -2.526879e-03  -6.913402e-03
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## 2-94183      1.473707e-02   5.231406e-03
## 2-94187      9.872432e-04   6.690717e-03
## 2-94202     -1.530058e-03  -6.296237e-02
## 2-94204     -2.208282e-02   1.362822e-02

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## 2-94227 -2.559467e-02 -4.509348e-03
## 2-94232 -1.778041e-02 4.195047e-02
## 2-94246 -1.778041e-02 4.195047e-02
## 2-94269 1.824540e-03 -8.853112e-03
## 2-94317 2.352580e-02 -7.407574e-03
## 2-94488 -4.973355e-05 4.540501e-03
## 2-94651_2 2.860836e-02 -1.901515e-03
## 2-94658 6.897037e-03 -4.212931e-03
## 2-94688 2.695237e-02 -3.153544e-02
## 2-94805 -2.755156e-02 8.898620e-04
## 2-94832 1.990683e-02 3.962328e-03
## 2-94860 -3.670931e-02 -3.830093e-02
## 2-94898 -2.976274e-02 5.096203e-03
## 2-94930 2.088525e-03 -3.812365e-03
## 2-94976 -5.931536e-04 2.744087e-03
## 2-94992 -6.024761e-03 -2.732250e-03
## 2-94994 -8.939507e-03 -2.246436e-02
## 2-94998 3.187728e-02 -3.465199e-02
## 2-95059 -1.250139e-03 -6.705342e-03
## 2-95279 -3.491942e-03 -1.742034e-02
## 2-95322 -5.345136e-03 -1.297092e-03
## 2-95323 -2.149976e-02 -2.113399e-02
## 2-95329 1.255688e-02 -2.941851e-03
## 2-95341 2.109020e-03 6.921597e-03
## 2-95369 2.865103e-04 -4.805560e-02
## 2-95425 2.109020e-03 6.921597e-03
## 2-95432 6.016222e-03 2.777235e-02
## 2-95559 -1.574393e-02 3.415629e-03
## 2-95568 -4.179688e-03 -2.811397e-02
## 2-95575 5.897983e-02 1.001873e-01
## 2-95602 5.280579e-02 -4.689367e-02
## 2-95682 -3.526513e-03 -2.592390e-02
## 2-95703 -3.526513e-03 -2.592390e-02
## 2-95769 3.231272e-03 1.853640e-02
## 2-95792 -3.526513e-03 -2.592390e-02
## 2-95798 -1.342608e-02 6.848299e-03
## 2-95805 1.225529e-01 -8.091929e-02
## 2-95818 9.106561e-03 3.770837e-04
## 2-95823 3.231272e-03 1.853640e-02
## 2-95853 -8.717203e-03 -2.216465e-02
## 2-95887 1.723122e-02 8.745669e-03
## 2-95922 -2.901097e-02 9.029229e-04
## 2-95933 -1.829622e-02 -2.802123e-02
## 2-95997 4.643022e-03 1.557319e-02
## 2-96016 -1.341496e-02 1.545022e-02
## 2-96091 1.788606e-02 6.270632e-03
## 2-96092 -7.629534e-03 -5.891398e-03
## 2-96093 3.796628e-03 2.032402e-02
## 2-96109 9.930700e-03 -1.053029e-03
## 2-96231 -2.424127e-02 -2.115608e-02
## 2-96285 -1.112247e-03 -1.367686e-02
## 2-96286 3.796628e-03 2.032402e-02
## 2-96305 -3.994861e-03 -4.684933e-03
## 2-96319 -1.064635e-02 -1.171315e-02

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## 2-96330      2.683812e-03  2.891701e-02
## 2-96333      -7.206143e-03 -6.239930e-03
## 2-96384      -3.303321e-03 -2.681723e-02
## 2-96403      6.833973e-04 -5.790050e-03
## 2-96432      -2.149976e-02 -2.113399e-02
## 2-96542      4.394731e-03  8.287266e-02
## 2-96557      -1.621660e-02  4.092877e-02
## 2-96585      -7.151008e-03  9.706472e-02
## 2-96602      -4.601563e-03 -6.661878e-03
## 2-96606      -1.215796e-02 -1.614718e-02
## 2-96644      2.065434e-02  7.616885e-03
## 2-96645      -5.081858e-03 -2.502325e-02
## 2-96739      2.065434e-02  7.616885e-03
## 2-96793      -6.619056e-03  3.102458e-03
## 2-96795      -3.474605e-02 -1.833045e-02
## 2-96817      1.654774e-02  1.146093e-02
## 2-96920      1.430881e-02 -3.304660e-02
## 2-96991      1.207049e-02  2.737620e-03
## 2-97056      -5.717609e-02 -2.461461e-04
## 2-97192      1.085989e-02 -6.786848e-03
## 2-97193      -3.360855e-02 -5.723281e-03
## 2-97193_2    -2.589621e-02  3.336349e-02
## 2-97232      -2.326014e-03 -1.378237e-02
## 2-97273      -6.337709e-03 -4.891184e-03
## 2-97288      -1.122031e-02 -5.210676e-03
## 2-97362      -3.346254e-03 -1.434785e-02
## 2-97385      -1.265107e-02  1.794179e-02
## 2-97385_2    -1.265107e-02  1.794179e-02
## 2-97502      -1.914587e-02 -1.161131e-02
## 2-97508      1.303664e-02  2.893273e-02
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## 2-97549      -4.924681e-03  1.862561e-03
## 2-97568      -3.760164e-03 -2.239623e-02
## 2-97570      1.136968e-03 -3.655788e-03
## 2-97588      2.084487e-03  1.079529e-02
## 2-97699      -2.364295e-02  9.966164e-04
## 2-97804      -2.403920e-02  2.284394e-03
## 2-97913      -7.404459e-03 -1.632984e-02
## 2-97922      -8.706204e-03 -3.098032e-02
## 2-97939      -1.089740e-02  5.571485e-05
## 2-97969      -1.104222e-02 -5.938929e-03
## 2-97992      1.518705e-02  3.632917e-03
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## 2-98040      -2.849062e-02  8.850092e-04
## 2-98041      -3.970986e-02 -3.608254e-02
## 2-98092      -6.692201e-03 -1.600553e-03
## 2-98098      3.230648e-02  1.807026e-02
## 2-98152      -2.468893e-02 -1.233698e-02
## 2-98154      -2.710550e-02  3.651426e-02
## 2-98170      -3.353655e-02 -4.719990e-03
## 2-98195      -5.963163e-03 -3.538400e-03

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## 2-98231      1.493971e-02 -3.244861e-02
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## 2-98281      8.407280e-03 -2.056364e-02
## 2-98307      3.230648e-02  1.807026e-02
## 2-98307_2    4.740977e-02  3.583590e-03
## 2-98354      -1.146582e-02 7.416217e-04
## 2-98520      3.037467e-02  5.180340e-04
## 2-98538      -1.292352e-02 -1.122908e-02
## 2-98547      -3.999413e-03 -2.381645e-02
## 2-98560      9.989675e-02  4.024876e-03
## 2-98580      1.639571e-02  3.390200e-02
## 2-98586      3.133993e-03 -2.433672e-03
## 2-98659      -4.085834e-02 -2.972001e-02
## 2-98662      2.003798e-02 -6.360899e-02
## 2-98669      -4.104361e-02 -7.577266e-03
## 2-98723      -4.364712e-03 -2.489933e-02
## 2-98770      -2.099101e-02  6.614442e-02
## 2-98776      -5.144195e-02 -4.231345e-02
## 2-98804      -4.161541e-02 -3.040754e-02
## 2-98864      8.759140e-03  1.356413e-03
## 2-98892      -2.616782e-04 -3.480268e-03
## 2-98927      -6.674806e-03 -1.474409e-02
## 2-99054      1.010869e-02  5.496968e-03
## 2-99142      4.372822e-03  2.270882e-02
## 2-99178      3.634604e-03  2.567052e-02
## 2-99266      4.067744e-03  2.336926e-02
## 2-99269      -1.581594e-02 -1.020130e-03
## 2-99326      1.696934e-02  6.244114e-03
## 2-99328      -1.264990e-02  7.096397e-04
## 2-99341      -4.305195e-03  3.147068e-02
## 2-99342      1.001246e-02 -1.793506e-03
## 2-99493      -1.077415e-02 -1.025508e-03
## 2-99495      -3.870478e-03 -2.315973e-02
## 2-99512      6.098825e-05 -5.506158e-03
## 2-99522      -6.569654e-03 -1.414970e-02
## 2-99570      -2.991752e-02 -3.649014e-02
## 2-99684      8.510431e-03 -1.679600e-02
## 2-99709      -1.936877e-02 -7.917680e-03
## 2-99743      5.394428e-02  8.484527e-02
## 2-99770      -1.634543e-02 -4.284085e-03
## 2-99799      -6.569654e-03 -1.414970e-02
## 2-99824      2.458489e-02  5.285085e-02
## 2-99880      -2.993407e-03  3.137461e-05
## 2-99936      -2.925329e-02 -1.807151e-02
## 2-99973      -1.239315e-03 -6.329370e-03
## 3-100007      -6.471352e-03 -1.279054e-02
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## 3-100050      2.802989e-02 -6.262996e-03
## 3-100057      -1.368824e-02 -3.366723e-03
## 3-100109      2.050686e-03  1.076620e-02
## 3-100145      -1.646773e-02 -2.074446e-03
## 3-100170      1.323253e-02  1.378912e-02
## 3-100257      2.739651e-02  2.731154e-02
## 3-100259      4.622790e-02 -7.850661e-03

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## 3-100371      1.363860e-02  1.151400e-02
## 3-100398     9.830398e-03  3.737457e-02
## 3-100436     3.559691e-03  -8.430709e-03
## 3-100448     3.114810e-02  3.589729e-02
## 3-100449    -1.368824e-02  -3.366723e-03
## 3-100487     4.431580e-02  -2.581344e-02
## 3-100502    -3.904391e-02   4.673500e-03
## 3-100509     2.215587e-02  -1.767769e-02
## 3-100515     8.209580e-03  -4.866929e-03
## 3-100567     2.698227e-03   1.212943e-02
## 3-100644     4.431580e-02  -2.581344e-02
## 3-100772    -1.080868e-02   5.219291e-03
## 3-100787    -6.193852e-03  -7.165000e-03
## 3-100800     1.967353e-02   6.238740e-03
## 3-100855     6.271590e-02  -4.042241e-02
## 3-101017    -1.086536e-02   1.014230e-02
## 3-101022     1.038560e-02   1.494356e-02
## 3-101054     2.222317e-02   2.207001e-02
## 3-101062    -1.195637e-02   8.457777e-02
## 3-101114    -4.986581e-02  -1.242614e-02
## 3-101238    -1.072529e-02  -2.734760e-03
## 3-101248     1.353821e-02   5.999166e-03
## 3-101397     3.569861e-02  -1.094475e-02
## 3-101423    -1.553849e-02   5.958632e-02
## 3-101430     7.515395e-02  -3.592903e-02
## 3-101471    -6.100147e-02   5.466096e-02
## 3-101495    -8.849325e-03   5.093991e-02
## 3-101511     7.907970e-03   2.134508e-02
## 3-101549    -6.139809e-04   3.036998e-03
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## 3-101577    -1.227378e-02  -4.147540e-02
## 3-101603     8.474657e-03  -3.834257e-03
## 3-101637     5.700314e-02   3.708916e-02
## 3-101682    -9.709340e-03   1.035346e-02
## 3-101685     2.578647e-03  -3.001367e-03
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## 3-101734    -9.044532e-03   7.535981e-03
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## 3-101850    -2.756794e-03  -2.029872e-04
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## 3-102128     1.984539e-02   8.504308e-03
## 3-102161     1.421710e-02   2.367858e-02
## 3-102223     1.892092e-02   9.210937e-04
## 3-102373     4.158096e-02  -7.210897e-02
## 3-102375     1.292935e-03   6.941968e-03
## 3-102413    -9.029359e-03  -2.380244e-03
## 3-102414     2.272077e-02   1.346184e-02
## 3-102484     2.507595e-03  -1.457083e-02
## 3-102537     2.550299e-02   2.870676e-02
## 3-102619     1.283487e-02   5.997609e-03
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## 3-102712    -4.820060e-02   2.216026e-03

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## 3-102760 -6.690041e-04 -3.249834e-03
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## 3-102924 1.146155e-02 2.638265e-02
## 3-103108 1.076266e-02 -8.120903e-03
## 3-103182 1.307278e-02 6.394475e-03
## 3-103206 -2.014764e-02 -1.166259e-02
## 3-103297 6.102339e-02 -3.944187e-02
## 3-103332 -1.806850e-02 6.793164e-02
## 3-103447 1.015003e-02 1.028243e-02
## 3-103453 6.143154e-02 -3.503557e-02
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## 3-103479 2.024546e-03 4.254835e-03
## 3-103510 1.606113e-02 4.625824e-03
## 3-103541 -7.267786e-03 2.644463e-02
## 3-103552 2.305282e-03 7.027379e-03
## 3-103637 -1.388269e-02 -4.564426e-02
## 3-103654 6.757437e-03 -3.343260e-03
## 3-103718 -1.615392e-02 -2.445916e-02
## 3-103734 2.500305e-03 1.490813e-02
## 3-103771 -1.648503e-02 7.172820e-02
## 3-103788 -1.155876e-02 3.010885e-02
## 3-103924 7.249139e-02 -6.493607e-02
## 3-104038 -1.897741e-02 -1.836768e-02
## 3-104050 3.516707e-03 1.517847e-02
## 3-104141 2.753171e-02 3.261871e-02
## 3-104209 -1.198203e-02 1.446857e-03
## 3-104271 -1.731736e-02 4.518944e-02
## 3-104327 7.457578e-03 2.220519e-02
## 3-104365 -1.256856e-02 1.968163e-02
## 3-104437 -3.397460e-03 -8.632911e-03
## 3-104631 -3.523943e-02 -1.165062e-02
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## 3-104659 -6.266879e-02 2.563977e-02
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## 3-104784 8.944895e-03 3.444649e-04
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## 3-104843 8.823180e-03 1.637489e-04
## 3-104881 3.010263e-02 3.053724e-02
## 3-104902 4.057318e-03 1.349639e-02
## 3-104903 2.241368e-04 -2.528167e-03
## 3-104946 -1.548001e-02 2.947417e-02
## 3-104986 8.148972e-03 -6.035519e-03
## 3-104992 2.021007e-02 4.137439e-02
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## 3-105017 8.148972e-03 -6.035519e-03
## 3-105042 5.348014e-04 -1.621324e-03
## 3-105053 9.795708e-03 8.986561e-03
## 3-105106 -1.364812e-02 1.181287e-02
## 3-105169 -9.943436e-03 -1.124506e-02
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## 3-105286 -5.758000e-02 -9.729822e-03

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## 3-105379 -5.942391e-04 -8.199581e-03
## 3-105404 2.982864e-03 1.109980e-02
## 3-105414 -3.624382e-03 -6.905473e-03
## 3-105485 -1.677428e-03 1.970266e-03
## 3-105488 -3.135818e-02 -2.050121e-02
## 3-105507 -2.452447e-02 -2.096300e-02
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## 3-105556 -2.882317e-02 -4.390069e-03
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## 3-105865 -2.882317e-02 -4.390069e-03
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## 3-105927 1.286081e-02 3.099643e-02
## 3-106090 1.103295e-02 9.567484e-03
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## 3-106203 8.100868e-03 -2.877836e-04
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## 3-106321 2.148880e-03 4.000640e-03
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## 3-106457 -4.121930e-03 -1.108714e-02
## 3-106500 -4.121930e-03 -1.108714e-02
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## 3-106512 3.338268e-02 1.390793e-02
## 3-106530 -1.301761e-03 -1.255750e-02
## 3-106590 -1.436934e-02 -1.715852e-02
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## 3-106832 -1.717680e-02 -4.059224e-03
## 3-106852 -1.641557e-02 -3.396290e-03
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## 3-107573 -1.971940e-02 -1.691783e-02
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## 3-108871 -4.218839e-03 -6.746892e-03
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## 3-109120 -3.969862e-02 -3.421821e-02
## 3-109136 -3.875300e-02 3.241970e-03
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## 3-109234 -1.330431e-02 4.826511e-02
## 3-109238 8.778410e-02 -1.126880e-02
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## 3-109482 1.162220e-02 2.951064e-03
## 3-109489 1.458640e-02 2.680448e-03
## 3-109530 3.977765e-03 -1.000187e-02
## 3-109536 -7.028858e-03 -4.124634e-02
## 3-109552 2.259746e-03 4.717739e-03
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## 3-112164      -3.173943e-02 -2.739351e-02
## 3-112241      -1.835827e-03  4.563293e-04
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## 3-112265      -3.399277e-02 -5.356029e-03
## 3-112276      -8.424430e-03  2.819777e-02
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## 3-112329      -8.082475e-03  6.783834e-02
## 3-112341      -2.648414e-03  6.042267e-03
## 3-112350      -1.592964e-02  -1.038791e-02
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## 3-114948      -1.462908e-02 -5.926654e-03
## 3-114977      1.177383e-02   2.636501e-02
## 3-114985      6.404782e-04   1.310966e-02
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## 3-115043      -4.319799e-03  1.137475e-02
## 3-115063      -8.695417e-03  -6.625854e-03
## 3-115130      -2.757135e-02  -1.969192e-03
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## 3-116227      2.798298e-02   -2.761693e-02
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## 3-116573    -4.682614e-02  -5.680589e-03
## 3-116625    -1.715894e-02  -1.705875e-02
## 3-116649    -2.876365e-02  2.874002e-02
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## 3-116808    1.643596e-02  3.417576e-03
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## 3-117011    1.823440e-02  -5.730185e-03
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## 3-118147    -1.273731e-02  8.029297e-03
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## 3-118232    -2.152136e-03  -6.093269e-03
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## 3-120081     -7.736461e-03  -1.237615e-03
## 3-120136      1.043761e-02   1.005405e-03
## 3-120158      4.604110e-02  -1.605380e-02

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## 3-120160      -2.017734e-02 -7.236600e-03
## 3-120160_2    2.395303e-02  8.638988e-03
## 3-120167      -1.696465e-03  1.646141e-03
## 3-120197      -9.525975e-03  5.087260e-02
## 3-120258      2.049052e-02  -6.922870e-03
## 3-120276      2.728315e-02  5.573447e-03
## 3-120276_2   -3.357006e-02  -2.903525e-02
## 3-120281      -3.856167e-03  4.099976e-03
## 3-120306      4.612314e-02  -4.418331e-02
## 3-120381      1.113815e-02  4.373508e-02
## 3-120388      8.327500e-03  1.151617e-02
## 3-120457      1.486950e-02  4.885349e-03
## 3-120468      1.377432e-02  2.580424e-02
## 3-120503      4.899877e-03  2.416021e-02
## 3-120520      1.154160e-02  1.321426e-03
## 3-120550      -3.146611e-04  9.229458e-04
## 3-120631      -5.759687e-03  1.308718e-02
## 3-120719      -1.186642e-02  -5.713651e-02
## 3-120803      7.893037e-03  -7.380651e-03
## 3-120821      5.351634e-03  2.457058e-02
## 3-120869      -2.587755e-04  -6.103260e-03
## 3-120919      5.218179e-03  -5.807702e-03
## 3-120967      4.604110e-02  -1.605380e-02
## 3-120979      -3.326716e-03  -9.982359e-03
## 3-121047      1.545217e-02  9.798117e-03
## 3-121106      -3.680882e-03  4.790395e-03
## 3-121114      -1.472100e-02  3.322488e-02
## 3-121173      9.051848e-03  -1.779274e-03
## 3-121195      -2.465463e-02  1.871225e-02
## 3-121321      1.920913e-02  3.221610e-03
## 3-121358      1.759826e-03  1.392246e-02
## 3-121366      -1.365811e-02  -9.125358e-03
## 3-121384      -6.407691e-03  -9.870560e-03
## 3-121411      -1.162146e-02  2.316771e-02
## 3-121436      -9.427212e-04  -1.593578e-03
## 3-121471      -2.101765e-02  -1.104540e-02
## 3-121495      2.955052e-02  5.343624e-02
## 3-121498      4.604110e-02  -1.605380e-02
## 3-121560      -2.082958e-02  -2.036568e-02
## 3-121572      -2.082958e-02  -2.036568e-02
## 3-121608      4.670869e-02  -3.381740e-02
## 3-121619      2.596655e-03  5.686429e-03
## 3-121656      1.246276e-02  4.623194e-03
## 3-121677      1.024488e-02  1.105810e-02
## 3-121703      -2.174284e-02  -1.373618e-02
## 3-121765      -1.407053e-03  5.133703e-03
## 3-121841      -1.112963e-03  -6.234372e-03
## 3-121965      -4.747688e-02  -3.807832e-02
## 3-121986      -3.120422e-02  2.057357e-02
## 3-122003      -1.240054e-03  -8.352731e-03
## 3-122060      4.484903e-03  1.469610e-02
## 3-122144      1.381469e-02  -4.921375e-03
## 3-122180      -2.185151e-03  -9.697348e-03
## 3-122191      3.335650e-03  1.109837e-02

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## 3-122209      3.335650e-03  1.109837e-02
## 3-122209_2   -1.302523e-03 -1.592268e-03
## 3-122287      3.335650e-03  1.109837e-02
## 3-122288      6.206754e-03 -3.136938e-02
## 3-122292      1.521867e-02  1.217842e-02
## 3-122294      1.333899e-02 -3.784214e-04
## 3-122360      7.870162e-03  3.569287e-03
## 3-122529      1.784536e-02 -1.158397e-04
## 3-122576      5.949148e-02 -4.628907e-02
## 3-122620      8.052042e-03  3.243079e-03
## 3-122691      1.973288e-02  7.232389e-03
## 3-122726      -1.535664e-02 5.635287e-03
## 3-122794      -2.368694e-02 -2.335535e-02
## 3-122833      6.186216e-02 -4.914315e-02
## 3-122869      -6.745610e-03 -3.555528e-03
## 3-122908      -4.221603e-03 -4.033649e-03
## 3-122938      -1.716209e-02 -1.013747e-02
## 3-122940      -6.745610e-03 -3.555528e-03
## 3-122942      -1.095176e-02 1.019720e-02
## 3-122980      -1.730961e-02 -8.936575e-03
## 3-123217      4.214406e-03 -7.368322e-03
## 3-123248      -2.329164e-03 4.402178e-02
## 3-123290      5.944054e-04 -7.110337e-03
## 3-123303      -8.238562e-03 -4.336175e-02
## 3-123317      8.239787e-03  4.191883e-03
## 3-123447      -7.174021e-03 -3.400616e-03
## 3-123452      5.403088e-04 -6.664301e-03
## 3-123620      1.341594e-02  8.133941e-03
## 3-123718      -2.428113e-02 1.384916e-03
## 3-123749      6.595824e-03  1.672552e-02
## 3-123785      4.118222e-02 -2.469832e-02
## 3-123816      -1.708026e-04 -9.149907e-03
## 3-123841      -1.827420e-02 1.991420e-02
## 3-123856      8.391063e-04 -5.185764e-03
## 3-123863      1.577332e-02  2.520425e-02
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## 3-123871      -2.736716e-02 -4.288569e-03
## 3-123946      1.821506e-02 -9.206295e-03
## 3-123994      -7.174021e-03 -3.400616e-03
## 3-124005      -3.586791e-03 4.115011e-03
## 3-124033      -1.319545e-02 2.068301e-02
## 3-124064      -7.174021e-03 -3.400616e-03
## 3-124278      -3.514576e-02 -3.210487e-02
## 3-124281      -3.480073e-03 2.846323e-03
## 3-124292      8.613448e-02 -5.863684e-02
## 3-124370      -7.153663e-03 -1.492226e-03
## 3-124498      1.188698e-02 1.129870e-02
## 3-124545      -7.185708e-05 2.621820e-03
## 3-124697      -2.095405e-03 1.090709e-03
## 3-124703      -7.185708e-05 2.621820e-03
## 3-124741      -1.918854e-02 -9.944058e-03
## 3-124816      4.670869e-02 -3.381740e-02
## 3-124850      1.035397e-03 -6.866778e-03
## 3-124852      1.762791e-02 2.925936e-02

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## 3-124855      2.034849e-02  7.010026e-03
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## 3-124901      1.246162e-02  -1.600898e-03
## 3-124924      4.571385e-02  -3.042176e-02
## 3-124924_2    -3.234689e-02  -1.921244e-03
## 3-124941      4.482060e-02  1.854798e-02
## 3-125004      -2.912679e-03  5.115431e-03
## 3-125008      -2.095405e-03  1.090709e-03
## 3-125011      -1.461160e-03  -5.092664e-03
## 3-125048      2.068889e-03  1.102831e-03
## 3-125049      -1.089113e-02  5.273030e-03
## 3-125074      -2.096306e-02  2.258061e-02
## 3-125082      -1.761555e-02  1.611189e-03
## 3-125106      -7.601846e-03  -1.976196e-03
## 3-125123      2.610714e-02  -2.635355e-02
## 3-125175      -8.257019e-02  2.349213e-02
## 3-125192      6.216609e-04  -7.638254e-03
## 3-125269      -3.202516e-03  -9.995126e-03
## 3-125326      -1.138943e-02  2.146201e-03
## 3-125420      6.138117e-03  2.824762e-02
## 3-125452      -2.163567e-02  -7.900617e-03
## 3-125485      2.671848e-03  1.352037e-02
## 3-125560      4.208974e-02  -2.929983e-02
## 3-125629      4.513048e-02  -2.821550e-02
## 3-125632      -8.819858e-03  3.013262e-02
## 3-125669      -1.447688e-01  2.478201e-02
## 3-125815      1.403397e-02  3.482530e-02
## 3-125829      -3.362235e-03  3.330064e-02
## 3-125880      3.063323e-03  1.048873e-02
## 3-125884      5.286663e-02  -4.310602e-02
## 3-125888      8.612683e-03  -5.064640e-03
## 3-125914      4.506164e-02  -3.242235e-02
## 3-125943      3.840968e-02  -1.974988e-02
## 3-126041      -1.820056e-02  -1.553567e-02
## 3-126046      -7.435697e-03  1.322331e-02
## 3-126055      -1.577695e-02  2.174529e-02
## 3-126072      2.589652e-02  2.592319e-02
## 3-126074      -1.918854e-02  -9.944058e-03
## 3-126095      1.536418e-03  8.617868e-03
## 3-126108      -4.783931e-03  -6.864501e-03
## 3-126184      -2.478967e-02  -2.078690e-02
## 3-126227      -2.313950e-02  -5.769972e-03
## 3-126259      2.964071e-03  1.347344e-03
## 3-126266      9.866128e-03  1.490105e-03
## 3-126320      5.479832e-03  -2.365327e-02
## 3-126367      -1.060885e-03  -1.368714e-03
## 3-126424      1.052641e-02  1.235588e-03
## 3-126443      1.038557e-02  1.018529e-02
## 3-126465      -5.319112e-03  -6.699827e-03
## 3-126556      4.071607e-02  9.840014e-03
## 3-126562      5.428932e-03  -2.779602e-02
## 3-126570      2.474019e-03  9.826330e-03
## 3-126621      -1.019437e-03  -1.561842e-02
## 3-126628      1.854643e-02  4.022389e-02

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## 3-126636      5.454338e-02 -3.011435e-02
## 3-126638     -3.185247e-02 -4.185648e-02
## 3-126655      2.393905e-02  2.220647e-02
## 3-126658      3.671075e-04 -3.759756e-02
## 3-126716      5.454338e-02 -3.011435e-02
## 3-126744      3.143453e-02  1.252410e-02
## 3-126755      1.854643e-02  4.022389e-02
## 3-126757     -4.063521e-03  2.619257e-02
## 3-126782      1.754548e-02 -9.576611e-03
## 3-126793     -3.062940e-02 -4.038378e-02
## 3-126815     -3.455295e-03 -3.964945e-03
## 3-126822     -4.903841e-02  2.014391e-02
## 3-126825      4.309388e-02  9.564376e-03
## 3-126831      1.879686e-02 -1.124893e-02
## 3-126873     -2.126815e-03  3.653451e-02
## 3-126874      2.972777e-02  2.097105e-02
## 3-126994     -5.638830e-03  3.410602e-02
## 3-127007      1.916464e-02  4.153756e-02
## 3-127088      2.131700e-02  9.053309e-03
## 3-127166      2.404524e-02  1.009619e-02
## 3-127174      9.909760e-02 -7.180262e-02
## 3-127194     -1.680311e-03 -6.352564e-03
## 3-127374     -3.233147e-02  1.609914e-02
## 3-127417      4.624411e-02  1.780083e-02
## 3-127431     -7.424649e-03  2.430205e-02
## 3-127478      4.213211e-03 -1.814654e-03
## 3-127483      3.170776e-03 -3.367484e-02
## 3-127530     -4.448068e-02 -3.782280e-02
## 3-127563     -1.053480e-02 -3.471380e-02
## 3-127594     -1.680311e-03 -6.352564e-03
## 3-127609     -3.218429e-02 -2.786908e-02
## 3-127697      4.852278e-02 -2.625021e-02
## 3-127711     -4.385719e-02 -3.732645e-02
## 3-127811      5.869018e-03  9.620076e-04
## 3-127818      2.187920e-03  1.347659e-03
## 3-127889     -3.405384e-02  6.683962e-02
## 3-127924      1.751098e-02 -2.373945e-02
## 3-127974      5.463607e-03 -5.691852e-02
## 3-128046      2.441897e-02 -3.677906e-02
## 3-128052     -6.696830e-03 -1.049239e-02
## 3-128099      5.447372e-02 -3.387746e-02
## 3-128129      6.038239e-03  2.161684e-02
## 3-128160     -1.672271e-02 -6.439434e-03
## 3-128223     -3.840995e-02  1.779698e-03
## 3-128265      3.354170e-02  1.505083e-02
## 3-128275      1.714461e-02  3.378126e-02
## 3-128395      6.821496e-03  2.047780e-02
## 3-128512      6.748981e-02 -2.813527e-04
## 3-128552      1.262910e-03 -8.021082e-04
## 3-128605     -3.012736e-04 -6.704679e-03
## 3-128620      6.781052e-03  2.927671e-03
## 3-128622     -3.916171e-02  1.133492e-03
## 3-128694     -3.343474e-02 -2.867852e-03
## 3-128698      1.342362e-02  2.621040e-02

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## 3-128703 -4.159741e-02 2.399150e-03
## 3-128730 5.772839e-02 -5.132502e-02
## 3-128737 4.157437e-04 -4.415081e-02
## 3-128762 -2.752563e-02 2.335294e-02
## 3-128765 4.131550e-02 -1.441001e-02
## 3-128878 -5.129162e-03 1.189086e-03
## 3-128935 1.230147e-03 -1.379063e-02
## 3-128948 -1.994439e-02 3.653180e-02
## 3-128983 4.131550e-02 -1.441001e-02
## 3-129011 -1.469580e-02 1.011667e-02
## 3-129030 9.431836e-04 6.100752e-03
## 3-129045 -3.127552e-02 -2.803644e-03
## 3-129057 -3.676907e-03 -5.609741e-03
## 3-129068 -2.946564e-02 -8.894034e-03
## 3-129087 1.117633e-02 -1.320737e-03
## 3-129105 -4.200213e-02 2.244101e-03
## 3-129181 -1.480671e-03 -3.274760e-02
## 3-129251 -1.110948e-02 -4.272363e-03
## 3-129283 -3.532780e-03 -9.149922e-03
## 3-129306 -3.931654e-02 -3.128370e-03
## 3-129320 -1.949624e-03 7.853070e-03
## 3-129386 4.188579e-02 1.025844e-02
## 3-129396 5.286629e-03 4.822237e-03
## 3-129408 -4.131307e-03 -5.757656e-02
## 3-129493 5.505059e-02 -4.546179e-02
## 3-129508 -5.766310e-02 -1.874070e-02
## 3-129557 1.433255e-02 -1.477988e-03
## 3-129632 3.523008e-02 -1.463378e-02
## 3-129654 -3.587226e-03 -8.012010e-03
## 3-129684 -2.245851e-02 1.043312e-02
## 3-129839 3.494152e-02 1.357003e-02
## 3-129853 -1.626010e-02 -9.561261e-03
## 3-129908 -1.600897e-02 -6.666547e-03
## 3-129956 -6.946633e-02 -1.658774e-02
## 3-129981 -1.365100e-02 -6.812710e-03
## 3-130069 -1.387986e-02 -5.514310e-03
## 3-130072 4.075736e-03 1.410251e-02
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## 3-130100 -4.882278e-03 3.407435e-02
## 3-130216 1.394637e-02 2.576998e-02
## 3-130245 -5.653538e-02 -4.510384e-03
## 3-130276 8.459831e-04 2.579891e-04
## 3-130295 4.861991e-02 -2.939151e-02
## 3-130348 -1.115248e-02 3.075831e-02
## 3-130444 -7.007852e-02 -9.473187e-04
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## 3-130644 6.519983e-03 -4.653313e-03
## 3-130661 -2.820981e-03 -1.016264e-03
## 3-130672 -2.477188e-02 7.401773e-04
## 3-130687 -2.268104e-02 -1.064270e-02
## 3-130733 -4.310447e-03 -9.120700e-04

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## 3-130780      9.705324e-03 -7.912150e-04
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## 3-130877     -2.970662e-03 -1.295711e-03
## 3-130896     -3.391058e-03 -1.456374e-02
## 3-130898     -2.970662e-03 -1.295711e-03
## 3-130996     -3.638283e-02  4.232006e-03
## 3-131031      6.580138e-04 -8.244030e-03
## 3-131084     -1.490845e-03 -3.333278e-03
## 3-131107     -8.048706e-03 -7.084266e-02
## 3-131114     -1.077255e-02 -6.501871e-03
## 3-131201     -2.040234e-03 -2.819084e-02
## 3-131227      1.076443e-02 -2.764640e-03
## 3-131459     -3.639307e-03 -3.142080e-02
## 3-131575      6.268009e-02 -2.710477e-02
## 3-131584      6.964962e-03 -2.799500e-03
## 3-131668     -5.315986e-03 -3.384029e-02
## 3-131669     -2.785488e-02 -1.000334e-02
## 3-131685      9.534986e-03 -1.079777e-03
## 3-131695      2.853998e-02 -1.357633e-02
## 3-131698     -3.188866e-02 -2.857670e-02
## 3-131715     -3.580831e-02  1.997756e-02
## 3-131728      3.546360e-02  2.172198e-02
## 3-131765     -2.068375e-02 -5.144850e-03
## 3-131858      4.129309e-02 -1.446295e-02
## 3-132025      1.783868e-02  1.610669e-02
## 3-132069     -1.767702e-02  6.819045e-03
## 3-132097     -1.420826e-02 -1.423435e-02
## 3-132119      2.292206e-02 -8.186752e-05
## 3-132134     -2.828658e-02 -3.352423e-02
## 3-132134_2    1.575971e-02 -3.206014e-03
## 3-132155     -2.566542e-03 -7.020319e-03
## 3-132174      7.253433e-02 -4.436526e-04
## 3-132207      2.125476e-02  8.136513e-03
## 3-132215      1.179289e-02 -1.128033e-04
## 3-132325     -4.307719e-02 -8.941942e-03
## 3-132325_2   -5.161341e-03 -3.608917e-02
## 3-132346     -4.935315e-02  9.965934e-03
## 3-132350     -4.935315e-02  9.965934e-03
## 3-132354      4.129309e-02 -1.446295e-02
## 3-132355      4.166701e-03  1.338022e-02
## 3-132378      4.320980e-03  1.617629e-02
## 3-132391     -1.302973e-02  1.129866e-02
## 3-132398     -1.611680e-02 -7.972615e-03
## 3-132398_2   3.325448e-02 -7.071942e-04
## 3-132400     -3.113197e-02 -8.568357e-03
## 3-132458      1.195077e-01 -3.276784e-02
## 3-132463      1.370202e-02  2.939030e-02
## 3-132483     -1.302973e-02  1.129866e-02
## 3-132539      7.279903e-02  1.049560e-03
## 3-132581     -2.451451e-02  3.873876e-03
## 3-132589      2.173647e-02 -6.365927e-02
## 3-132589_2   -2.085651e-03 -2.655459e-03
## 3-132618      7.279903e-02  1.049560e-03

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## 3-132619 -7.076824e-05 -4.106429e-03
## 3-132657 1.562719e-02 3.364858e-02
## 3-132726 -4.410698e-03 2.597179e-04
## 3-132837 1.856417e-02 6.540482e-03
## 3-132895 -1.485141e-03 -6.407789e-03
## 3-132922 7.279903e-02 1.049560e-03
## 3-132999 2.799344e-04 -4.796874e-03
## 3-133011 3.858699e-02 -4.547826e-02
## 3-133012 -3.590810e-02 -1.565026e-02
## 3-133028 3.182840e-03 2.433223e-03
## 3-133090 -1.719842e-02 -8.127725e-03
## 3-133100 -7.213489e-03 -3.098329e-03
## 3-133102 4.596279e-03 3.672182e-03
## 3-133107 -2.774349e-02 -3.371553e-02
## 3-133147 1.436078e-02 3.025751e-02
## 3-133157 -2.804276e-02 2.275116e-02
## 3-133220 -1.045858e-02 1.288154e-02
## 3-133226 1.136297e-02 8.253379e-03
## 3-133264 -7.412249e-04 -3.600311e-03
## 3-133277 -1.445570e-02 -8.456014e-03
## 3-133287 -1.357762e-03 -1.134226e-02
## 3-133289 1.191372e-02 -5.739626e-04
## 3-133326 7.802486e-02 -1.106209e-04
## 3-133341 5.427675e-03 -7.112482e-03
## 3-133345 -1.036077e-02 2.055549e-02
## 3-133351 -3.262877e-02 -4.002099e-02
## 3-133354 -2.251107e-03 -2.889330e-02
## 3-133381 2.759326e-02 1.017708e-02
## 3-133385 -1.826001e-02 -6.473102e-03
## 3-133460 7.556906e-02 1.280350e-03
## 3-133483 1.182305e-02 -1.232065e-03
## 3-133502 -4.830371e-02 -6.075862e-02
## 3-133550 1.676365e-03 -3.015689e-03
## 3-133562 -2.787700e-02 -1.767519e-03
## 3-133621 -3.166352e-04 -6.351225e-03
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## 3-133813 -8.411170e-03 1.910339e-02
## 3-133832 -4.890015e-02 -6.123112e-02
## 3-133859 3.043303e-03 -1.575512e-03
## 3-133873 -3.689009e-02 -4.608636e-02
## 3-133873_2 -2.577556e-02 -1.367342e-02
## 3-133879 6.974763e-03 1.520883e-02
## 3-133895 -2.932022e-02 -4.383831e-04
## 3-133896 -4.085089e-03 -1.168732e-02
## 3-133915 2.180567e-02 3.954896e-02
## 3-133920 -9.808536e-03 -1.022348e-03
## 3-133935 2.982292e-03 2.300438e-03
## 3-133938 4.814181e-02 -5.046270e-02
## 3-133976 7.993757e-03 -6.580382e-03
## 3-133995 -6.239172e-03 -1.040401e-01
## 3-134087 7.802486e-02 -1.106209e-04
## 3-134087_2 -1.369496e-02 -1.182975e-02

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## 3-134314      -1.933533e-02  5.089690e-02
## 3-134343      1.457154e-03  -4.578983e-03
## 3-134364      -1.589872e-02  -7.453695e-03
## 3-134396      7.802486e-02  -1.106209e-04
## 3-134421      1.804356e-02  3.847247e-02
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## 3-134471      8.035542e-03  -5.098923e-03
## 3-134479      -3.192320e-02  -6.877047e-03
## 3-134526      2.011509e-02  3.264805e-03
## 3-134532      -5.606791e-02  -6.734764e-02
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## 3-134826      -2.211185e-03  -2.596439e-02
## 3-134919      2.264197e-02  4.155940e-02
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## 3-135192      -3.561804e-03  -1.291137e-02
## 3-135193      1.145771e-03  -2.008311e-02
## 3-135202      -7.232184e-03  9.288036e-03
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## 3-135476      -4.083474e-03  -4.379040e-03
## 3-135503      6.672543e-03  -9.204063e-03
## 3-135509      1.948274e-03  -6.784069e-03
## 3-135610      -2.184445e-03  -2.593095e-02
## 3-135621      1.739133e-02  7.260366e-05
## 3-135629      7.936665e-02  -4.091102e-02
## 3-135634      5.090739e-03  -2.358684e-03
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## 3-135708      1.272950e-02  2.568989e-02
## 3-135737      -5.574429e-02  4.182436e-02
## 3-135761      -3.453153e-02  5.290490e-02
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## 3-136002      -4.139231e-02  -1.400072e-03
## 3-136008      -1.213279e-02  -2.250621e-02
## 3-136019      -4.419913e-03  -1.052795e-02
## 3-136039      -7.133499e-02  -1.064328e-02
## 3-136085      4.241418e-03  -2.731371e-02
## 3-136104      2.553799e-03  -5.802142e-03
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## 3-136175      7.075430e-03   1.911676e-02
## 3-136195      4.213953e-03   2.266771e-02
## 3-136216      -2.294544e-02  -3.908753e-02
## 3-136218      1.988123e-02   3.645858e-02
## 3-136227      -1.272644e-02  -1.906309e-02
## 3-136321      -3.663250e-02  -4.512087e-02
## 3-136343      -9.335494e-03  -8.215864e-04
## 3-136347      3.240938e-02   1.570222e-02
## 3-136408      5.585619e-02   4.909960e-03
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## 3-136707      3.031787e-02  -1.338719e-02
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## 3-136989      3.430895e-02  -1.189912e-02
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## 3-137031      -1.125167e-04  -3.565151e-03
## 3-137032      2.312335e-04  -4.673514e-03
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## 3-137056      -7.689761e-04  -4.936540e-03
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## 3-137259      -1.655263e-03  -7.952502e-03
## 3-137298      -1.467425e-02  -1.431433e-02
## 3-137302      -1.398044e-02   4.657978e-03
## 3-137335      1.973266e-02   3.596772e-02
## 3-137433      6.407871e-03   5.655515e-03
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## 3-137487      6.338298e-03   5.264410e-03
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## 3-137910      -7.685611e-03  3.858545e-03
## 3-137937      1.878909e-02  -9.731006e-03
## 3-137963      1.351117e-02  4.419700e-03
## 3-138044      -2.933966e-04  -2.555254e-02
## 3-138056      5.120542e-03  9.628766e-02
## 3-138068      -1.078961e-02  -1.253650e-02
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## 3-138153      -5.943169e-02  -3.068993e-02
## 3-138208      -9.699949e-03  1.050315e-01
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## 3-138238      2.842181e-02  6.256101e-03
## 3-138245      -3.612662e-02  -1.684161e-02
## 3-138278      -2.144727e-02  -6.385503e-02
## 3-138345      -1.306491e-02  -1.214508e-02
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## 3-138864      -3.583807e-03  3.896485e-02
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## 3-138938      3.995624e-03  2.458744e-03
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## 3-139568      7.651736e-03  -3.778191e-03
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## 3-139654      4.426893e-03  -5.196892e-03
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## 3-139668      1.033021e-02  -8.753568e-03

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## 3-139894     -1.326814e-02  1.707856e-02
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## 3-139938      1.160437e-02  4.956401e-03
## 3-139959     -3.409894e-02  -7.634441e-03
## 3-140015     -2.418487e-03  -2.380014e-03
## 3-140100     -3.487139e-02  -4.151134e-02
## 3-140232     -4.174107e-02  -4.819995e-03
## 3-140266      1.685913e-02  3.640243e-03
## 3-140337      8.831788e-03  -1.354588e-02
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## 3-142318 -1.340582e-02 -9.810414e-03
## 3-142335 6.513738e-03 -9.556134e-04
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## 3-142803 -4.961893e-02 -8.528676e-03
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## 3-143396 1.469054e-02 3.959469e-03
## 3-143442 -2.829463e-03 -3.920560e-03
## 3-143449 7.726996e-02 -5.048383e-02
## 3-143466 8.582013e-03 1.336772e-02
## 3-143476 7.107024e-03 -1.338671e-03
## 3-143503 1.102896e-01 -2.482277e-02
## 3-143549 3.872459e-02 -1.280570e-02
## 3-143552 3.305953e-03 8.582064e-03
## 3-143583 -1.697609e-04 -7.373596e-03
## 3-143658 3.703747e-03 -8.359140e-03
## 3-143690 -2.798408e-02 -1.503162e-02
## 3-143725 -2.014349e-04 3.200418e-04
## 3-143750 4.732510e-03 -9.220313e-03

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## 3-143795      -1.654512e-02  1.262124e-03
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## 3-143825      8.578467e-03   1.225318e-02
## 3-143849      2.187304e-02   7.453442e-02
## 3-143876      -1.555191e-02   1.354254e-03
## 3-143893      4.745148e-04   3.858661e-03
## 3-143916      2.706018e-02   8.380166e-02
## 3-143931      2.112328e-02   5.328449e-03
## 3-144003      -1.639598e-03  -1.540334e-02
## 3-144014      -5.596365e-03  -3.648582e-02
## 3-144025      -3.217593e-02  -2.489542e-02
## 3-144066      4.899107e-03  -8.777052e-03
## 3-144175      4.162524e-02  -1.532888e-02
## 3-144186      9.796507e-03   2.400057e-03
## 3-144203      1.282890e-02   1.798408e-03
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## 3-144324      8.177914e-03   -1.978782e-03
## 3-144397      -1.313510e-03  9.697922e-03
## 3-144427      8.956236e-03   9.111847e-03
## 3-144430      9.417240e-02   -7.207593e-02
## 3-144454      5.151781e-03   2.843518e-03
## 3-144579      -4.297748e-03  1.702082e-02
## 3-144583      1.456213e-02   8.895927e-03
## 3-144599      -9.508615e-03  -1.165434e-03
## 3-144607      -6.003008e-02  1.132927e-02
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## 3-144692      1.475202e-03   3.405576e-04
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## 3-144760      7.883316e-03   -7.449745e-04
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## 3-144879      -1.628479e-02  3.131115e-02
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## 3-144993      8.077853e-04   -1.935919e-02
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## 3-145026      8.502728e-03   -8.425016e-03
## 3-145039      3.934335e-02  -1.725563e-02
## 3-145066      -1.281062e-02  2.814354e-02
## 3-145117      -3.308889e-02  2.414445e-02
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## 3-145160      -1.276121e-02  -1.690348e-02
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## 3-145581   8.295790e-03  -8.150540e-03
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## 3-145831  -2.201189e-02   1.706414e-02
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## 3-145850  -1.091109e-02   1.702247e-02
## 3-145924   4.389352e-03   2.737754e-03
## 3-145954  -1.520248e-02   3.025546e-02
## 3-145966  -1.405406e-03  -1.910322e-04
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## 3-146264  -2.445612e-02  -8.665307e-03
## 3-146348  -4.227379e-02  -3.640581e-03
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## 3-146373  -2.086544e-02   3.466623e-02
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## 3-146468  -1.466734e-02  -1.693194e-02
## 3-146535  -2.005520e-02   4.006110e-02
## 3-146541  -1.519376e-02  -2.129442e-02
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## 3-146982  -1.332346e-02  -8.671356e-03
## 3-147028  -5.960295e-03   9.169092e-03
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## 3-147085   1.824949e-02   3.991870e-02
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## 3-147214   5.745295e-02  -4.823313e-02
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## 3-147308      3.212049e-03  -2.556328e-02
## 3-147405     -1.595909e-02  -7.137577e-03
## 3-147427     -7.597307e-03  -5.540037e-03
## 3-147443     -1.546822e-02  2.613883e-02
## 3-147524     -3.306693e-03  -4.344356e-02
## 3-147538      3.913078e-02  -1.293584e-02
## 3-147586     -5.625472e-02  -5.517902e-05
## 3-147622      1.088142e-01  -2.615448e-02
## 3-147645      1.479596e-03  -6.837039e-03
## 3-147651      1.416054e-02  7.310829e-03
## 3-147662     -2.241713e-02  6.963061e-02
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## 3-147740      5.192996e-02  -4.697468e-02
## 3-147755      6.199627e-04  1.548910e-02
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## 3-149462 -5.777369e-02 -1.513844e-02
## 3-149503 -1.609440e-02 -1.239426e-02
## 3-149505 6.254827e-03 -8.510368e-04
## 3-149512 7.726444e-03 1.083711e-02
## 3-149513 1.819416e-02 2.698084e-03
## 3-149545 -2.537767e-03 2.866664e-03
## 3-149568 -4.834027e-03 1.021681e-02
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## 3-149807 -7.569047e-03 -6.889277e-03
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## 4-150148 -1.262062e-03 3.584626e-03
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## 4-151106 -1.100717e-02 -3.109543e-02
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## 4-151163 -3.018390e-02 1.998553e-02
## 4-151170 4.298778e-03 7.173882e-03
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## 4-166887 1.847985e-02 3.614292e-02
## 4-166889 -7.495792e-03 2.426269e-03
## 4-166922 2.699853e-03 -2.363461e-03
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## 4-167174      -1.945646e-02  4.422607e-03
## 4-167192      1.184169e-04   8.676725e-04
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## 4-171597 -4.047890e-02 -3.483531e-03
## 4-171664 -3.145380e-02 -1.416018e-02
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## 4-171751  4.303682e-02 -3.336393e-02
## 4-171763  1.992022e-03  3.768228e-03
## 4-171767  1.373534e-02  3.689060e-03
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## 4-173703 -2.208656e-03 -5.459987e-03
## 4-173727 -2.063607e-02 -1.576876e-02
## 4-173885 -1.122909e-01 -1.477620e-01
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## 4-173975 -1.730989e-02 3.469495e-03
## 4-173978 -9.714877e-03 -5.186473e-03
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## 4-174200 1.806770e-02 -6.846074e-03
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## 4-174242 -3.502377e-02 -3.243180e-03
## 4-174308 -2.100021e-02 1.710973e-02
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## 4-174406 -1.822669e-04 2.486265e-02
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## 4-175314 1.933912e-03 -3.516864e-03
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## 4-175464 -2.714544e-02 -1.062231e-03
## 4-175490 8.355970e-02 -1.914825e-03
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## 4-177826      -1.741883e-02  3.963009e-02
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## 4-179052      1.098809e-02  3.979851e-03
## 4-179072      1.949730e-02  4.620346e-03
## 4-179082      8.334261e-02  -1.115605e-03
## 4-179083      8.334261e-02  -1.115605e-03
## 4-179085      -1.408559e-02  -6.751607e-04
## 4-179115      -1.975411e-02  -2.069820e-02
## 4-179142      9.486270e-04  -2.737714e-03

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## 4-179286      1.681036e-02  4.503864e-02
## 4-179294      1.891827e-02  9.235779e-03
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## 4-179368     -7.045165e-03 -7.562279e-03
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## 4-179792     -1.720892e-02  6.148679e-02
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## 4-179981     -5.730089e-02 -1.092684e-02
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## 4-180243     -2.463246e-02 -1.709613e-02
## 4-180444      1.315088e-02 -7.702053e-03
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## 4-180536      8.578467e-03  1.225318e-02
## 4-180545     -3.999916e-03  6.427498e-03
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## 4-180731     -8.938674e-03  3.940524e-02
## 4-180738      1.122247e-02  2.566328e-02
## 4-180752     -6.395581e-02 -5.233752e-02
## 4-180760      6.049737e-04 -1.649207e-03
## 4-180812     -6.075430e-02 -7.890442e-03
## 4-180848      8.272326e-03 -2.041861e-03

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## 4-180987 -2.346453e-03 -2.973228e-02
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## 4-181049 -1.164588e-02 2.543633e-02
## 4-181063 2.118544e-02 -8.044347e-03
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## 4-181264 -8.151917e-03 2.160775e-02
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## 4-181312 9.581850e-03 -5.298116e-04
## 4-181358 -9.666863e-03 2.065766e-02
## 4-181370 8.578467e-03 1.225318e-02
## 4-181388 -2.812854e-02 -2.780434e-02
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## 4-181820 1.685528e-02 7.172354e-03
## 4-181881 1.634535e-02 -4.425022e-02
## 4-181941 -2.693894e-03 1.503552e-03
## 4-181962 1.472689e-02 -4.370484e-03
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## 4-183310 -6.742737e-03 -1.064724e-03
## 4-183325 1.151227e-02 -5.498864e-03
## 4-183336 1.422623e-02 1.503414e-03
## 4-183367 -1.102871e-01 -2.842255e-02
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## 4-183391 -9.781254e-03 1.925050e-02
## 4-183460 1.335365e-02 1.077696e-03
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## 4-183621 -1.146671e-02 -5.702176e-03
## 4-183628 -7.232194e-03 -2.290675e-02
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## 4-183702 -6.321089e-03 -1.306154e-02
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## 4-183941 4.757425e-03 8.775176e-04
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## 4-184413 -3.749697e-03 -2.131337e-02
## 4-184487 1.686659e-02 2.901267e-03
## 4-184496 -2.835076e-02 -3.608040e-02
## 4-184552 -2.120602e-03 5.323850e-03
## 4-184555 -7.759969e-03 1.273933e-02
## 4-184565 -4.961319e-03 -1.919926e-02
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## 4-184888     -4.910757e-03 -5.798872e-03
## 4-184950     -9.085826e-03 -1.515058e-03
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## 4-186474     -3.045648e-02 -4.405659e-03
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## 4-186807     -1.402413e-03 -2.729510e-03
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## 4-186829     -1.276678e-03 -1.540577e-02
## 4-186830     -2.827696e-02  1.011638e-02
## 4-187010     -5.421493e-03  1.642077e-02
## 4-187162      4.767607e-02 -1.574543e-02
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## 4-187223     -9.304885e-04 -1.254864e-02
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## 4-187315     -3.035988e-02  2.118870e-02
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## 4-187354      7.033085e-03  2.268014e-02
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## 4-187913      1.783056e-02 -1.848852e-04
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## 4-189347     -3.460738e-02  -2.362873e-02
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## 4-190565     -6.760570e-03  2.099854e-02
## 4-190604     -8.105241e-03  -9.086543e-03
## 4-190627     -3.398526e-03  -3.455490e-03
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## 4-190642      2.616128e-02  1.072981e-02
## 4-190716     -1.145795e-02  9.306694e-03
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## 4-190945 -4.313779e-02 -1.067205e-02
## 4-190987 -5.639530e-03 -1.299627e-02
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## 4-191004 2.163153e-02 1.987500e-02
## 4-191186 4.523590e-02 -4.550914e-02
## 4-191203 -6.008260e-03 1.763548e-02
## 4-191237 -3.189675e-02 -3.035581e-02
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## 4-191267 -4.219043e-02 -3.274404e-02
## 4-191295 2.387713e-03 9.295333e-03
## 4-191302 -2.529358e-03 5.478985e-03
## 4-191305 4.523590e-02 -4.550914e-02
## 4-191305_2 -9.859893e-03 2.310017e-02
## 4-191322 -2.660706e-03 -6.987699e-03
## 4-191334 1.072779e-02 3.240102e-03
## 4-191341 2.054322e-02 8.215524e-03
## 4-191354 -1.093972e-03 6.387616e-03
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## 4-191557 -2.288244e-02 1.417612e-02
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## 4-191947 7.535200e-03 -5.300653e-03
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## 4-192047 7.402331e-03 1.628274e-03
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## 4-192361 -6.209974e-03 -1.451939e-02
## 4-192365 -2.204051e-03 -9.903090e-03
## 4-192378 9.933825e-04 3.222700e-04
## 4-192486 -1.599953e-02 -6.105349e-03
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## 5-202867 1.837731e-02 7.355468e-03

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## 5-203007 -2.187292e-02 1.722290e-02
## 5-203010 -2.187292e-02 1.722290e-02
## 5-203014 2.660045e-04 4.455866e-03
## 5-203092 8.868970e-02 4.929664e-02
## 5-203236 5.076666e-02 -2.138624e-02
## 5-203258 -6.372319e-04 -1.577952e-02
## 5-203261 -2.175653e-02 -7.380698e-03
## 5-203264 7.086732e-02 -5.409122e-02
## 5-203269 -2.376200e-02 -2.704118e-02
## 5-203274 -1.959163e-02 3.511779e-02
## 5-203280 -1.959163e-02 3.511779e-02
## 5-203285 1.229889e-02 1.061871e-02
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## 5-203317 2.314878e-03 -4.714290e-03
## 5-203325 -2.540677e-02 1.405864e-02
## 5-203367 5.333602e-02 -1.701210e-02
## 5-203387 7.055488e-02 -4.643996e-02
## 5-203397 5.076666e-02 -2.138624e-02
## 5-203400 2.030901e-02 4.751788e-02
## 5-203447 2.347676e-02 7.128227e-03
## 5-203587 3.390313e-03 4.814853e-03
## 5-203649 1.403588e-02 4.986205e-03
## 5-203688 -5.757919e-03 -1.779059e-02
## 5-203719 -1.497403e-02 3.323055e-02
## 5-203821 3.344607e-02 1.092597e-02
## 5-203872 1.302904e-02 2.958975e-02
## 5-203907 -2.342464e-02 -8.949025e-03
## 5-203940 1.600613e-03 6.105255e-03
## 5-204009 -1.497403e-02 3.323055e-02
## 5-204024 -1.010461e-02 -3.271307e-03
## 5-204047 5.647139e-03 -2.977418e-02
## 5-204096 -1.584299e-02 4.062653e-02
## 5-204270 -2.273508e-03 -8.233470e-03
## 5-204327 1.937077e-02 -1.840545e-02
## 5-204459 -1.894419e-02 1.369451e-02
## 5-204516 2.143767e-02 7.630729e-03
## 5-204539 1.312112e-03 -1.941302e-02
## 5-204606 1.491335e-04 -4.161415e-03
## 5-204612 3.291668e-03 -3.342791e-03
## 5-204626 -1.912582e-02 1.295844e-02
## 5-204629 -6.615739e-02 1.366042e-01
## 5-204692 1.306591e-03 -3.234190e-02
## 5-204695 3.344581e-02 -3.264461e-02
## 5-204734 2.143767e-02 7.630729e-03
## 5-204912 -2.837361e-03 -1.108451e-02
## 5-204933 3.652657e-03 1.044744e-02
## 5-204960 7.046627e-03 1.804198e-02
## 5-205007 8.940873e-05 9.421337e-03
## 5-205061 9.278870e-04 -2.540459e-02
## 5-205080 -1.233514e-02 8.108724e-03
## 5-205114 1.112913e-03 -5.313975e-03
## 5-205125 4.076498e-02 -2.793448e-03
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## 5-205224 1.415012e-02 4.150604e-02

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## 5-205289      1.239722e-02  5.132538e-03
## 5-205314      3.621397e-03  -5.898663e-03
## 5-205421     -3.403125e-02  1.582648e-02
## 5-205459     -3.112087e-02  -1.526695e-03
## 5-205470      1.571930e-02  4.375008e-03
## 5-205474     -6.316788e-02  -1.213307e-02
## 5-205474_2   -2.590227e-03  -2.511613e-02
## 5-205482      3.533713e-03  -9.828944e-03
## 5-205559     -4.532044e-03  2.143398e-03
## 5-205593     -2.603322e-02  -3.599582e-02
## 5-205598     -1.875441e-02  7.934650e-03
## 5-205620      2.405232e-04  -4.716889e-03
## 5-205632      3.910831e-02  8.501767e-03
## 5-205700      8.220763e-03  1.415908e-02
## 5-205785     -5.458631e-03  -3.415888e-02
## 5-205856     -2.960066e-02  1.851510e-02
## 5-205909     -4.071812e-04  -8.609433e-03
## 5-205998      1.133560e-02  3.651002e-03
## 5-206006      1.057703e-02  -1.112067e-02
## 5-206018     -1.193974e-02  3.845904e-03
## 5-206144     -6.816443e-04  -9.909562e-03
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## 5-206185     -2.571952e-02  2.413911e-02
## 5-206194     -3.288845e-02  4.929488e-02
## 5-206208      3.192681e-02  -1.569497e-03
## 5-206234      1.169862e-03  8.211057e-03
## 5-206254     -1.141129e-02  1.300278e-02
## 5-206272      1.065534e-02  -7.409873e-04
## 5-206328      3.192681e-02  -1.569497e-03
## 5-206381     -1.249689e-04  -1.102524e-02
## 5-206402     -5.264269e-02  2.263974e-03
## 5-206599      5.865151e-03  5.151808e-04
## 5-206627      5.865151e-03  5.151808e-04
## 5-206659     -2.988178e-03  1.368296e-05
## 5-206691      1.777047e-03  -2.641733e-02
## 5-206836     -3.869297e-02  2.503682e-02
## 5-206863      2.633282e-03  -1.501090e-03
## 5-206873      3.116311e-04  1.500494e-02
## 5-206893     -4.214809e-03  1.437395e-02
## 5-206904      2.366952e-02  6.850604e-02
## 5-206989     -5.877072e-02  -4.875018e-02
## 5-206998      3.341234e-04  5.409316e-03
## 5-207026     -4.075134e-02  -1.259480e-01
## 5-207028      9.215551e-03  1.949560e-03
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## 5-207124     -7.506783e-03  1.115542e-02
## 5-207146     -1.140275e-02  -8.773698e-04
## 5-207222      4.241353e-03  -5.803777e-03
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## 5-207319      1.267721e-02  2.962110e-02

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## 5-207406     5.717873e-03 -3.868830e-04
## 5-207429    -5.833119e-02 -5.205121e-02
## 5-207455    -3.780353e-02 -4.284185e-02
## 5-207567    -2.514664e-02  2.110104e-02
## 5-207660     2.872668e-03  1.887198e-02
## 5-207709     1.196069e-04 -4.298991e-03
## 5-207716     4.578780e-03 -3.744900e-02
## 5-207748     1.815755e-02  3.622944e-03
## 5-207776     1.330699e-02  2.703322e-02
## 5-207780     1.218848e-02  3.245329e-02
## 5-207814     2.553770e-03  1.422635e-02
## 5-207868    -3.186288e-02 -3.671586e-02
## 5-207934     1.015227e-04  1.183271e-03
## 5-207946    -3.771667e-05  7.292223e-03
## 5-207988    -2.753633e-03 -6.248779e-04
## 5-208171     4.024742e-02  1.411910e-02
## 5-208193    -6.801830e-03  3.301572e-03
## 5-208202     1.750959e-02  1.536733e-02
## 5-208295     9.974125e-04 -2.433768e-02
## 5-208300     3.101693e-03  2.050421e-02
## 5-208311     1.179471e-01 -6.765298e-02
## 5-208332     2.774684e-04 -4.004229e-03
## 5-208383     1.750959e-02  1.536733e-02
## 5-208394    -6.102172e-03  3.768305e-03
## 5-208416    -1.546748e-02  2.490552e-02
## 5-208426    -4.315819e-04  3.197173e-03
## 5-208479     1.931248e-03 -4.479005e-03
## 5-208589     1.102356e-01 -3.196956e-02
## 5-208594    -1.701448e-03  5.689850e-04
## 5-208645    -1.701448e-03  5.689850e-04
## 5-208673     1.752527e-02  3.295281e-03
## 5-208859     4.349090e-03  2.555995e-02
## 5-208920     2.596921e-02  1.264863e-02
## 5-209066     2.179139e-02  2.903583e-03
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## 5-209273    -2.787652e-02 -1.803783e-02
## 5-209336     2.945029e-02  4.848696e-03
## 5-209380    -1.386506e-02 -9.928863e-03
## 5-209424     2.502336e-02  1.106051e-02
## 5-209538     7.064736e-03  5.388969e-05
## 5-209572    -1.629353e-02 -6.731900e-02
## 5-209668     2.926497e-03 -3.199881e-02
## 5-209680    -6.403334e-02 -4.308017e-02
## 5-209776     1.451535e-02  6.214929e-03
## 5-209805    -2.296391e-03 -9.892622e-03
## 5-209859    -1.664588e-02 -6.677432e-02
## 5-209960     1.931248e-03 -4.479005e-03
## 5-209962    -1.679712e-02  5.424415e-02
## 5-209976     5.357826e-03 -8.329990e-03
## 5-209991    -1.275673e-02 -8.323429e-03
## 5-210004     1.724586e-02  5.847248e-03
## 5-210006    -5.308028e-04  1.150724e-02

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## 5-210073     -2.212285e-02   1.602747e-04
## 5-210077     -1.603675e-02  -2.631302e-04
## 5-210138     -2.373081e-04  -1.990693e-02
## 5-210163     -4.345618e-02  -6.763510e-03
## 5-210178      2.248256e-02   5.786648e-02
## 5-210222     -2.257279e-02  -6.009545e-05
## 5-210277      1.809164e-03  -2.410288e-02
## 5-210297     -1.181056e-02   1.539246e-02
## 5-210312      1.427519e-02   7.175082e-03
## 5-210362     -2.684637e-03  -1.454394e-03
## 5-210371      8.181880e-03  -2.023404e-03
## 5-210395     -4.029350e-03  -8.225101e-03
## 5-210463     -2.258691e-02  -1.613379e-02
## 5-210485      1.931248e-03  -4.479005e-03
## 5-210566     -1.603675e-02  -2.631302e-04
## 5-210577      4.396076e-04  2.906730e-03
## 5-210687      4.305054e-02   1.176097e-01
## 5-210748      2.490972e-03   1.447302e-02
## 5-210769      2.490972e-03   1.447302e-02
## 5-210774      6.842806e-03   2.805637e-02
## 5-210785      1.531347e-02   9.759291e-03
## 5-210785_2    -1.488989e-03  -2.342932e-02
## 5-210816     -9.525697e-03   1.274797e-02
## 5-210842      3.070718e-02  -5.682668e-02
## 5-210846     -2.717658e-02   1.846249e-03
## 5-210852     -3.194039e-04  -1.251837e-01
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## 5-211144     -4.430423e-03  -8.897105e-03
## 5-211187     -6.092941e-02  -9.725608e-03
## 5-211260      2.954714e-02  -1.519964e-02
## 5-211332      9.132385e-03   1.851908e-02
## 5-211351     -7.310952e-03  -1.561491e-02
## 5-211353     -7.310952e-03  -1.561491e-02
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## 5-211362      3.413311e-03   1.054396e-02
## 5-211496     -4.075228e-02   7.765197e-03
## 5-211508      7.371132e-03  -3.982328e-03
## 5-211588     -1.937189e-02   2.060242e-02
## 5-211589      2.470813e-02   4.487341e-03
## 5-211600     -3.690154e-02   1.244391e-02
## 5-211662      8.047401e-02  -2.300673e-02
## 5-211701     -3.202786e-03   3.800915e-02
## 5-211739      7.112446e-02  -4.068174e-02
## 5-211786     -3.164906e-02   2.664513e-03
## 5-211980      4.902688e-02   3.669950e-02
## 5-211988     -3.111247e-03  -1.044676e-02
## 5-212141     -2.504607e-03  -1.042265e-02
## 5-212160      5.505336e-03   1.292465e-02
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## 5-212375     -5.584185e-03  -1.045464e-02

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## 5-212400 -1.385707e-02 -2.852445e-02
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## 5-212461 5.583801e-02 3.717993e-02
## 5-212473 -2.662337e-02 -2.593477e-02
## 5-212537 -7.190355e-03 -1.544991e-02
## 5-212571 -2.546364e-02 3.901142e-02
## 5-212616 -6.286043e-02 -1.010739e-02
## 5-212653 -1.827264e-02 -1.227612e-03
## 5-212682 1.181264e-01 -4.071129e-02
## 5-212702 2.177802e-02 1.670847e-03
## 5-212745 5.211164e-03 1.749828e-02
## 5-212750 -1.030577e-02 -1.312598e-02
## 5-212762 1.190097e-01 -8.592609e-02
## 5-212788 9.070508e-03 -5.216861e-03
## 5-212804 -1.917548e-02 2.411416e-02
## 5-212866 -1.589771e-03 -1.069626e-02
## 5-212919 -1.374152e-02 -2.844121e-02
## 5-212960 8.512581e-03 -5.445832e-03
## 5-212999 1.341415e-03 -4.718171e-03
## 5-213017 3.310036e-02 -3.629101e-02
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## 5-213095 2.024903e-03 -4.106060e-03
## 5-213124 4.512559e-02 -9.704019e-03
## 5-213139 1.230641e-01 -4.174811e-02
## 5-213200 3.073523e-02 -1.364289e-02
## 5-213230 -2.278679e-02 5.399775e-02
## 5-213257 8.512581e-03 -5.445832e-03
## 5-213286 6.994627e-04 9.943560e-03
## 5-213292 -5.866530e-03 -2.847303e-02
## 5-213324 -8.839752e-03 1.275011e-02
## 5-213339 -5.746754e-02 -1.130754e-02
## 5-213351 -7.190355e-03 -1.544991e-02
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## 5-213398 1.855444e-03 -3.481945e-03
## 5-213494 -1.055528e-03 -1.997646e-02
## 5-213538 1.634709e-02 1.347068e-02
## 5-213643 -2.358859e-02 5.550642e-02
## 5-213664 -4.827477e-03 8.143227e-03
## 5-213696 -1.208694e-01 -8.674608e-02
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## 5-213844 -7.661595e-03 5.212628e-03
## 5-213854 1.214181e-02 -5.355002e-02
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## 5-213960 -2.033949e-02 -9.125897e-04
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## 5-214028 -2.021700e-02 1.207696e-02
## 5-214063 8.358126e-04 2.921297e-03
## 5-214075 2.038471e-02 1.173515e-02
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## 5-214104 -4.907439e-04 8.194798e-03

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## 5-214110 -5.622625e-03 -1.168252e-01
## 5-214116 5.129676e-03 -5.610408e-03
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## 5-214279 1.546290e-02 6.802597e-03
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## 5-214816 -3.444791e-02 -1.153620e-02
## 5-214867 2.766891e-03 -2.606080e-02
## 5-214872 9.223274e-03 2.962662e-03
## 5-214877 2.626428e-03 3.199847e-03
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## 5-214930 7.389459e-03 -2.208104e-02
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## 5-215004 9.732871e-03 1.990401e-02
## 5-215046 1.654124e-02 9.301600e-03
## 5-215099 -2.312980e-02 -1.106611e-02
## 5-215104 6.819556e-02 -6.495770e-02
## 5-215104_2 2.535842e-02 1.954132e-03
## 5-215222 1.126333e-02 -1.503849e-01
## 5-215225 1.317668e-02 -5.163389e-03
## 5-215256 1.377387e-02 4.886828e-03
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## 5-215476 2.581025e-02 1.160915e-02
## 5-215611 3.288276e-04 1.088946e-02
## 5-215652 -1.314157e-02 -1.809850e-03
## 5-215653 -2.121286e-02 -5.167675e-03
## 5-215654 4.889172e-03 -6.876218e-03
## 5-215655_2 -7.120422e-02 -1.597314e-02
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## 5-215740 -1.244542e-02 -9.228645e-03
## 5-215758 -2.121286e-02 -5.167675e-03
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## 5-215865 -4.318355e-03 -2.211564e-02
## 5-215928 -2.159225e-02 3.522929e-02
## 5-215933 -2.233656e-02 -1.097033e-02
## 5-215963 -2.138265e-02 -1.588702e-02
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## 5-216051 -6.737631e-03 -1.035008e-02

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## 5-216162      1.687200e-02  6.348149e-03
## 5-216227      1.005369e-01  -3.931211e-02
## 5-216256     -1.926354e-02  2.007824e-02
## 5-216281     -1.614549e-02  -1.536938e-02
## 5-216286      1.994944e-02  4.120054e-03
## 5-216296     -2.282851e-02  -4.880325e-03
## 5-216386      7.454641e-03  5.863895e-02
## 5-216422      4.036115e-02  -4.044981e-03
## 5-216424     -3.383846e-03  -7.525680e-03
## 5-216444      1.348359e-03  -2.272621e-03
## 5-216453      1.810832e-02  5.916876e-03
## 5-216455      8.144384e-02  -5.878435e-02
## 5-216487      3.768677e-02  -1.055402e-02
## 5-216493     -6.383935e-02  -5.825039e-02
## 5-216502      1.294706e-02  1.883273e-03
## 5-216516     -1.143598e-03  2.015496e-03
## 5-216590      2.133584e-02  4.170573e-03
## 5-216594      3.768677e-02  -1.055402e-02
## 5-216595      1.348359e-03  -2.272621e-03
## 5-216598     -1.991290e-02  -1.888010e-02
## 5-216600      6.495087e-03  -7.174131e-02
## 5-216642      7.859939e-03  2.178499e-02
## 5-216685      4.572417e-05  3.377096e-03
## 5-216694      3.768677e-02  -1.055402e-02
## 5-216698     -2.073480e-03  4.623580e-03
## 5-216718     -2.377151e-02  3.701746e-02
## 5-216859      3.116744e-02  7.259901e-02
## 5-216904      1.593728e-02  3.364987e-03
## 5-216992      3.651402e-03  -3.663842e-02
## 5-217063      3.189514e-02  -8.084893e-03
## 5-217089     -4.791127e-02  -5.695213e-02
## 5-217115      3.398114e-03  -3.630678e-02
## 5-217116      2.974467e-02  6.954454e-02
## 5-217189      1.231476e-02  3.928148e-03
## 5-217199     -1.812920e-02  2.081654e-02
## 5-217266     -5.583929e-05  -6.976428e-03
## 5-217294      2.974467e-02  6.954454e-02
## 5-217300      1.051256e-02  2.442761e-02
## 5-217320      7.475876e-02  -5.975939e-02
## 5-217322     -2.829544e-02  -3.080305e-03
## 5-217354      1.839792e-02  4.934247e-03
## 5-217394     -4.619150e-05  -1.262733e-02
## 5-217422     -2.184710e-02  4.670372e-02
## 5-217465     -8.248244e-03  -1.022013e-02
## 5-217477      3.752648e-03  4.486555e-03
## 5-217494      3.752648e-03  4.486555e-03
## 5-217550      2.292212e-02  6.417094e-03
## 5-217579     -8.771430e-02  -9.282545e-02
## 5-217660     -8.443073e-02  -1.501751e-01
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## 5-217734     -8.296643e-03  -4.676618e-03

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## 5-217755      3.661418e-03  1.769405e-03
## 5-217757      1.592316e-02  6.308035e-03
## 5-217795     -1.153416e-02  -2.359401e-03
## 5-217828     -2.176455e-02  6.117458e-03
## 5-217837     -2.114291e-02  4.589452e-02
## 5-217863     -3.788265e-03  -2.485118e-02
## 5-218008      4.591980e-04  -1.300104e-02
## 5-218018     -2.627630e-02  -8.453061e-03
## 5-218020      7.067707e-03  1.962307e-02
## 5-218033     -1.112649e-03  -2.360264e-02
## 5-218035      8.059206e-02  -3.268965e-04
## 5-218217      8.304242e-02  -4.333426e-04
## 5-218279     -1.174163e-02  4.551081e-02
## 5-218312     -1.174163e-02  4.551081e-02
## 5-218318     -2.037744e-04  -6.720315e-03
## 5-218379     -4.975124e-04  -7.179272e-03
## 5-218399      3.588921e-03  1.160008e-02
## 5-218452      6.297411e-03  4.783538e-03
## 5-218531     -6.678915e-03  -4.650040e-04
## 5-218549     -5.219793e-04  -7.381908e-03
## 5-218579     -3.300406e-02  1.843485e-02
## 5-218591     -3.671111e-03  -8.131768e-04
## 5-218690     -3.990546e-02  -4.096065e-02
## 5-218692      8.304242e-02  -4.333426e-04
## 5-218700      6.257785e-02  -4.538024e-02
## 5-218725     -3.614385e-03  -1.748809e-02
## 5-218726     -1.473334e-02  -8.446074e-03
## 5-218745      4.386764e-02  1.522781e-02
## 5-218816      2.272086e-03  -4.378570e-03
## 5-218828      3.484522e-02  -5.778790e-02
## 5-218880     -1.644721e-02  -5.489602e-04
## 5-218898      1.729045e-02  3.251221e-04
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## 5-218946      2.272086e-03  -4.378570e-03
## 5-218966      1.026001e-02  -9.439596e-03
## 5-218976     -3.695018e-03  -1.681530e-02
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## 5-219113     -1.994425e-02  8.770361e-03
## 5-219186      4.199559e-02  5.263152e-03
## 5-219199     -5.642643e-04  -8.785828e-03
## 5-219204     -7.110466e-03  -1.433228e-02
## 5-219214     -2.408846e-02  1.581219e-02
## 5-219225     -5.040988e-02  2.292424e-02
## 5-219325     -2.902645e-02  1.743885e-02
## 5-219376      3.274839e-02  -1.249572e-01
## 5-219548     -2.408846e-02  1.581219e-02
## 5-219623      8.059206e-02  -3.268965e-04
## 5-219673     -3.921420e-04  -5.971342e-03
## 5-219691      4.641444e-03  -8.152811e-03
## 5-219701     -1.155492e-02  -3.622931e-02
## 5-219745     -1.155492e-02  -3.622931e-02
## 5-219782      3.909606e-02  -2.726027e-02
## 5-219796     -1.729046e-02  -1.989684e-03

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## 5-219842      9.728730e-03  2.223847e-03
## 5-219858     -4.994605e-04  -5.770272e-03
## 5-219871     -9.750658e-03  -1.090266e-02
## 5-219970     -1.521213e-01  -1.369555e-01
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## 5-220062      2.550928e-03  1.294957e-03
## 5-220189      1.187662e-02  6.357325e-04
## 5-220192     -7.368059e-04  -9.584115e-03
## 5-220210     -1.155492e-02  -3.622931e-02
## 5-220221      1.187662e-02  6.357325e-04
## 5-220237      1.739845e-02  6.777881e-03
## 5-220242      7.881208e-03  7.113245e-04
## 5-220271     -4.605099e-03  1.316124e-02
## 5-220338      8.831488e-03  5.711290e-03
## 5-220350      3.465047e-02  -2.435764e-02
## 5-220414      6.747681e-03  1.574476e-02
## 5-220446      1.120125e-03  -1.653653e-03
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## 5-220743     -4.404672e-03  -4.441410e-02
## 5-220787      3.895490e-02  -1.292280e-02
## 5-220803      1.717361e-02  6.415468e-03
## 5-220932      1.262999e-02  6.140367e-03
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## 5-221026      1.758467e-02  3.284273e-02
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## 5-221195      2.487854e-02  7.101713e-03
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## 5-221248      8.169175e-03  -9.625004e-03
## 5-221251      1.710521e-02  5.567395e-03
## 5-221260     -8.207338e-02  -5.755477e-02
## 5-221432     -3.291991e-02  -9.236077e-03
## 5-221557      3.895490e-02  -1.292280e-02
## 5-221585      1.396237e-02  8.663103e-04
## 5-221589     -2.926762e-02  -2.152579e-02
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## 5-221719     -3.225266e-03  -4.084231e-03
## 5-221721     -2.720233e-03  -5.760835e-03
## 5-221766      8.944174e-03  2.329101e-03
## 5-221837     -2.367445e-03  -1.885972e-02
## 5-221938     -1.962980e-02  6.172778e-03
## 5-222004      1.441287e-02  8.700560e-04
## 5-222008     -1.898833e-02  6.885792e-03

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## 5-222028      2.245209e-02 -4.400976e-02
## 5-222049      -4.546901e-04 -4.446122e-03
## 5-222052      -1.984064e-02  8.520917e-03
## 5-222063      3.496535e-02  1.195230e-02
## 5-222073      1.006123e-02 -1.225659e-02
## 5-222095      1.816995e-03 -1.598744e-02
## 5-222130      -1.015526e-02 -6.891684e-03
## 5-222156      -4.345434e-03  8.907302e-03
## 5-222193      1.667597e-02  4.346063e-03
## 5-222375      -2.500817e-02  2.436709e-02
## 5-222390      -1.105227e-02  5.722433e-02
## 5-222414      1.447315e-02 -2.325364e-04
## 5-222437      -1.829618e-03 -4.530518e-04
## 5-222481      -2.131569e-02 -2.454980e-03
## 5-222571      3.799772e-03  1.443341e-02
## 5-222780      -1.489081e-03 -2.045429e-02
## 5-222825      8.304242e-02 -4.333426e-04
## 5-222837      4.023282e-02 -4.897103e-02
## 5-222948      4.553288e-02 -8.969817e-03
## 5-223026      5.437872e-02  2.639592e-02
## 5-223030      8.068491e-03  2.313298e-02
## 5-223042      -2.805859e-02 -4.942206e-03
## 5-223055      3.814088e-02  1.222255e-02
## 5-223097      -2.164222e-02  3.242220e-02
## 5-223099      1.118081e-02  3.603703e-03
## 5-223119      1.465495e-02 -6.984522e-04
## 5-223120      -1.104525e-02  5.023092e-03
## 5-223184      -1.712517e-02 -5.789654e-03
## 5-223191      1.010993e-02  3.904003e-03
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## 5-223282      -2.632570e-02  1.614369e-02
## 5-223319      1.064459e-02  2.177356e-02
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## 5-223569      -5.162138e-03  6.349212e-03
## 5-223637      8.637116e-03  1.692362e-03
## 5-223704      4.650033e-02 -1.065195e-02
## 5-223723      -1.734907e-02  2.014470e-02
## 5-223890      -3.095291e-02 -1.075945e-02
## 5-223914      4.135480e-02 -4.775517e-02
## 5-223983      2.002005e-04  8.496768e-02
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## 5-224124      8.652074e-02  5.231137e-02
## 5-224133      -9.814954e-03 -3.435136e-02
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## 5-224221      1.024069e-02  2.376070e-03

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## 5-224374 -2.751370e-03 -6.664938e-03
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## 5-224586 -1.285345e-02 2.859297e-02
## 5-224595 6.382097e-02 6.591981e-02
## 5-224632 2.569024e-03 -1.632290e-02
## 5-224648 1.047881e-02 4.154133e-03
## 5-224731 -1.514163e-02 2.778832e-02
## 5-224732 9.375884e-03 2.076869e-02
## 5-224742 8.300319e-03 -4.957255e-04
## 5-224757 8.667887e-03 1.947330e-03
## 5-224759 -8.420651e-03 -7.639479e-03
## 5-224785 4.480712e-02 -1.815533e-02
## 5-224809 -4.917997e-02 4.175853e-02
## 5-224816 -3.254815e-03 4.928602e-02
## 5-224819 7.673837e-04 -6.509287e-04
## 5-224834 -4.672482e-03 -3.525509e-02
## 5-224835 -3.348288e-02 2.807163e-02
## 5-224846 -2.020032e-02 -4.610578e-03
## 5-224868 2.688164e-02 3.108168e-02
## 5-224926 1.183997e-02 -6.823492e-03
## 5-224928 -4.390907e-02 -1.087571e-02
## 5-224949 -2.226970e-03 -2.181022e-02
## 5-224957 5.238982e-02 1.884355e-02
## 5-225004 6.374031e-04 -9.426117e-03
## 5-225006 6.662586e-04 -1.523465e-02
## 5-225007 -4.941103e-02 3.193238e-02
## 5-225019 -1.251003e-01 -1.213042e-01
## 5-225059 4.135480e-02 -4.775517e-02
## 5-225142 -1.540817e-02 -1.462834e-02
## 5-225184 -3.032559e-02 -3.700708e-02
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## 5-225242 7.151025e-03 -9.814414e-03
## 5-225286 4.978169e-02 1.787276e-02
## 5-225297 -3.032373e-03 -2.997558e-02
## 5-225305 -2.221609e-03 -1.741701e-02
## 5-225344 -2.847756e-03 -2.050427e-02
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## 5-225521 -1.627404e-02 3.518742e-02
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## 5-225618 1.232542e-02 2.758854e-03
## 5-225625 1.274673e-02 9.318772e-03
## 5-225696 -3.149753e-03 -1.563464e-03
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## 5-225895 3.429556e-02 -3.534939e-03
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## 5-226041      3.970686e-03 -7.051199e-03
## 5-226111     -8.482153e-03 -2.257782e-03
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## 5-226130      3.265782e-03 -9.792056e-03
## 5-226153     -1.243904e-02  1.046922e-03
## 5-226154     -2.748478e-02 -2.620789e-02
## 5-226192     -3.129243e-02  2.566494e-02
## 5-226243     -5.162688e-02 -8.133224e-03
## 5-226286      3.854594e-02 -3.281068e-02
## 5-226319     -9.174036e-03 -2.746150e-02
## 5-226358     -3.709825e-03 -3.253938e-03
## 5-226365      1.033829e-02  1.864869e-03
## 5-226373     -1.533369e-02  1.502997e-02
## 5-226384      8.304242e-02 -4.333426e-04
## 5-226397      9.002924e-03  4.067014e-02
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## 5-226498     -1.335428e-03 -1.698012e-02
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## 5-226510      1.636772e-02  3.210543e-02
## 5-226589      1.968424e-02 -4.204812e-03
## 5-226715      7.984180e-03 -2.227698e-03
## 5-226726     -8.757392e-03 -6.164200e-03
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## 5-226900     -4.792541e-03  9.751886e-03
## 5-226920      4.774189e-02 -3.968022e-02
## 5-226949     -8.757392e-03 -6.164200e-03
## 5-226959     -2.517057e-02  2.194988e-02
## 5-227044     -1.655502e-02 -1.294137e-03
## 5-227082     -2.020255e-02 -5.328743e-03
## 5-227228     -2.017265e-03 -1.537344e-02
## 5-227293     -3.287934e-02 -3.769663e-03
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## 5-227307     -1.786111e-02  1.368497e-02
## 5-227347      1.481237e-02  4.765205e-03
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## 5-227440     -7.876574e-03 -1.669893e-02
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## 5-227790     -6.417573e-02 -6.144848e-02
## 5-227793     -1.478447e-03  1.767655e-02
## 5-227802     -1.937724e-02  1.520312e-02
## 5-227854      1.344625e-03  1.040462e-03
## 5-227947      2.864256e-03 -1.703291e-02
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## 5-228037     -1.937724e-02  1.520312e-02

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## 5-228218      1.957439e-03 -4.601196e-03
## 5-228257      4.460989e-02  1.296413e-02
## 5-228282      -4.061456e-04  6.913092e-03
## 5-228317      -4.920312e-03 -2.044504e-02
## 5-228348      1.319763e-02  6.360678e-04
## 5-228531      8.976743e-03 -4.409578e-02
## 5-228561      -4.152587e-02 -5.329290e-02
## 5-228669      -4.951171e-02 -1.060754e-02
## 5-228692      1.682826e-02  3.626206e-02
## 5-228751      9.367717e-03 -6.200562e-04
## 5-228775      4.724767e-02  5.066939e-02
## 5-228777      2.291221e-02  3.373374e-03
## 5-228783      3.450989e-03  9.399569e-03
## 5-228786      -6.171921e-03 -1.901161e-02
## 5-228786_2    -1.472800e-02 -8.187116e-03
## 5-228811      1.574468e-02 -1.124578e-02
## 5-228896      -1.148286e-02 -4.261282e-03
## 5-228952      1.838876e-02  3.961562e-02
## 5-228988      5.189053e-03  1.690576e-02
## 5-228997      3.450989e-03  9.399569e-03
## 5-228999      1.956730e-02  4.325132e-02
## 5-229045      -1.893782e-02  2.609088e-02
## 5-229061      -3.140571e-03  7.406057e-03
## 5-229101      -6.171921e-03 -1.901161e-02
## 5-229117      -1.950854e-02  1.353061e-02
## 5-229153      2.959434e-03  1.094902e-02
## 5-229178      -8.851386e-03  6.592228e-03
## 5-229233      -1.508729e-03  7.017234e-03
## 5-229279      2.362091e-02  2.796523e-03
## 5-229334      -1.591242e-02 -4.734875e-02
## 5-229402      1.586267e-03  1.051062e-02
## 5-229443      6.284529e-03  1.287524e-02
## 5-229475      -3.826390e-04 -6.856493e-03
## 5-229485      -2.595178e-05  1.125772e-02
## 5-229490      3.435580e-03 -4.139571e-03
## 5-229533      -2.098066e-02  1.143965e-02
## 5-229545      -1.561295e-02  3.789266e-02
## 5-229567      1.976458e-02  8.407546e-03
## 5-229613      4.039048e-03 -1.210522e-03
## 5-229649      1.070021e-03  9.018761e-03
## 5-229679      6.689064e-03 -2.289254e-03
## 5-229686      -2.449809e-03  3.536963e-03
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## 5-229733      2.022426e-03 -3.917747e-03
## 5-229835      -6.190844e-03 -1.903993e-02
## 5-229868      -5.037510e-02 -3.683309e-03
## 5-229941      -1.948023e-02  1.269819e-02
## 5-229942      -4.171208e-02  5.159746e-02
## 5-229981_2    2.831486e-03 -1.988834e-02
## 5-230013      3.148607e-03 -9.198111e-03
## 5-230022      7.222068e-03  2.402588e-03
## 5-230089      -5.231056e-02 -6.429808e-02

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## 5-230193    1.320432e-02  2.109223e-03
## 5-230218    1.707339e-03  5.424777e-07
## 5-230254   -6.190844e-03 -1.903993e-02
## 5-230276    1.411351e-02  5.766517e-03
## 5-230285   -4.791375e-02 -5.875597e-02
## 5-230355    1.265969e-03  2.683524e-03
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## 5-230571    5.073942e-03 -8.314242e-03
## 5-230608   -2.559155e-03 -1.108207e-02
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## 5-230620    1.265969e-03  2.683524e-03
## 5-230687   -2.341529e-03 -1.123716e-02
## 5-230720    4.191513e-03  6.754026e-03
## 5-230740   -1.225593e-02 -4.129860e-02
## 5-230749   -4.684021e-02 -5.585080e-02
## 5-230753   -3.617984e-02 -5.417978e-03
## 5-230758   -1.225593e-02 -4.129860e-02
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## 5-231124    4.227392e-03 -6.506568e-03
## 5-231156   -3.401974e-02 -4.404175e-02
## 5-231180    4.341123e-02 -4.394174e-02
## 5-231310    1.441595e-03 -1.894084e-03
## 5-231328    9.390781e-03  1.760551e-02
## 5-231345   -1.507469e-02 -9.755558e-03
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## 5-231491    1.468272e-02  4.722218e-03
## 5-231509   -1.968832e-02 -1.276839e-02
## 5-231536   -7.090181e-02 -7.463294e-02
## 5-231618    1.468272e-02  4.722218e-03
## 5-231625    1.679125e-02 -2.370932e-03
## 5-231648    5.077899e-03  2.090738e-02
## 5-231715   -4.150972e-03 -6.172884e-03
## 5-231765    5.957804e-04 -8.904095e-03
## 5-231776    1.260823e-03 -2.692023e-03
## 5-231816    1.243590e-02 -1.036448e-03
## 5-231904   -1.858489e-02 -1.154899e-02
## 5-231915    1.691785e-02 -2.968772e-03
## 5-231928   -1.348309e-02  2.336389e-02
## 5-231941   -3.986210e-02 -5.054172e-03
## 5-231956    1.239916e-02  1.496489e-02
## 5-232059    9.455354e-02 -5.983791e-03
## 5-232063    1.788178e-03  1.425394e-02
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## 5-232083   -4.150972e-03 -6.172884e-03

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## 5-232200     -1.518140e-02 -4.796920e-03
## 5-232286      2.845430e-02 -1.032043e-02
## 5-232372     -2.369550e-03 -1.097817e-02
## 5-232480     -9.065915e-03 -9.298762e-02
## 5-232492     -1.208914e-02 -5.168813e-02
## 5-232600     -7.844927e-03 -2.513630e-03
## 5-232601     -1.129776e-02 -4.825973e-02
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## 5-232624     -2.215597e-03 -1.589067e-02
## 5-232754     -8.490626e-02 -1.911385e-01
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## 5-232820      1.268294e-02  1.252496e-02
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## 5-233088     -1.710771e-02 -1.617017e-02
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## 5-234360 -2.520672e-03 7.841846e-03
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## 5-234488 -1.211148e-02 1.739538e-02
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## 5-234905 -2.338007e-03 -1.661761e-02
## 5-234958 -8.313448e-04 -2.479949e-03
## 5-235074 -5.418814e-02 -4.005573e-03
## 5-235188 -1.856958e-03 5.207610e-03
## 5-235196 -2.014839e-02 -1.715194e-02
## 5-235293 1.546466e-02 2.735856e-02
## 5-235303 1.874260e-02 -1.004229e-02
## 5-235371 2.609386e-03 9.732981e-03
## 5-235381 7.436478e-03 2.232642e-02
## 5-235417 -4.006097e-03 1.660418e-02
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## 5-235714 1.395373e-02 3.268839e-03
## 5-235721 1.231425e-02 1.701979e-02
## 5-235735 -1.318436e-02 5.362380e-02
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## 5-236324 -1.940410e-03 3.317518e-03
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## 5-236468 -1.416596e-04 4.902904e-04
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## 5-236688 8.909468e-03 -6.185294e-03
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## 5-237117     -1.149817e-02   2.194517e-02
## 5-237158     -1.095533e-03  -1.637109e-02
## 5-237225      1.365521e-02   5.445560e-03
## 5-237236     -5.715892e-03   1.047973e-02
## 5-237238     -2.348335e-02  -1.012217e-02
## 5-237262      2.342604e-02   4.450890e-02
## 5-237264      2.668173e-02  -8.081796e-03
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## 5-237802      3.789599e-02  -1.301185e-02
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## 5-237976     -1.133044e-03   2.037940e-02
## 5-237981      4.669780e-02  -1.974996e-02
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## 5-238137      2.668173e-02  -8.081796e-03
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## 5-240439 -2.222670e-03 7.754679e-03
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## 5-240702 2.102174e-02 3.445118e-02
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## 5-241019 -1.546126e-02 4.676975e-03
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## 5-241046 -1.943116e-02 1.291910e-02
## 5-241077 1.267015e-02 5.664076e-03
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## 5-241231 -6.441312e-03 3.654423e-03
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## 5-241315 -2.120727e-04 -2.031648e-03
## 5-241326 1.305807e-02 6.174610e-03
## 5-241436 1.394617e-03 -8.793027e-03
## 5-241454 1.260406e-03 -4.320755e-03
## 5-241497 -3.841882e-03 3.745977e-02
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## 5-241644 8.273318e-03 7.646817e-02
## 5-241656 2.187499e-02 1.348964e-02
## 5-241666 -3.668778e-02 -1.157483e-02
## 5-241686 -1.040527e-02 -4.057071e-02
## 5-241698 1.238468e-02 6.350630e-03
## 5-241706 -1.705618e-02 -8.730427e-02
## 5-241706_2 2.282336e-03 -5.233512e-03
## 5-241716 -6.234521e-03 3.093418e-03
## 5-241721 1.137058e-02 4.368976e-03
## 5-241775 1.238468e-02 6.350630e-03
## 5-241968 -6.274712e-03 1.186468e-02
## 5-241969 -1.876305e-02 1.337068e-02
## 5-242025 1.164169e-02 3.050687e-02
## 5-242043 4.877346e-02 3.813317e-02
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## 5-242064 -2.189880e-02 7.100583e-03
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## 5-242183 2.428607e-03 -1.191950e-02
## 5-242240 -4.828435e-02 -1.279841e-02
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## 5-242300 1.120349e-02 5.729935e-03
## 5-242302 -3.382044e-03 -1.111085e-02
## 5-242327 4.363801e-02 4.942912e-03
## 5-242337 1.476927e-02 8.466408e-03
## 5-242337_2 1.286454e-02 4.928659e-03
## 5-242374 7.577977e-02 3.644534e-04
## 5-242379 1.430588e-02 6.178271e-03
## 5-242442 1.476927e-02 8.466408e-03
## 5-242479 1.960319e-02 4.210931e-02
## 5-242487 -1.501602e-02 -1.683702e-02
## 5-242513 1.481874e-02 3.003060e-03
## 5-242515 1.481874e-02 3.003060e-03
## 5-242531 1.233694e-03 -5.528620e-03
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## 5-242904      -7.793056e-03  1.866725e-02
## 5-242926      -1.275470e-02  -6.151801e-02
## 5-242948      3.543241e-02   -2.549333e-02
## 5-243000      2.155757e-02   8.977721e-03
## 5-243123      1.288171e-02   5.848436e-03
## 5-243181      1.457440e-02   1.113642e-03
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## 5-243317      -1.082845e-02  1.162198e-02
## 5-243377      -8.966276e-03  -5.439549e-03
## 5-243404      1.352921e-01   -7.097642e-03
## 5-243478      8.654503e-04   -2.198626e-03
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## 5-243560      6.142647e-03   -2.992858e-04
## 5-243645      6.101433e-06   -6.771732e-03
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## 5-243665      -2.336822e-02  -2.130720e-02
## 5-243742      1.215326e-02   3.950546e-03
## 5-243778      1.031092e-02   7.097149e-03
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## 5-243865      5.694057e-02   6.310065e-02
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## 5-243969      -3.570625e-03  -3.296465e-03
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## 5-244203      1.237224e-01   4.725208e-02
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## 5-244560      9.637008e-03   3.833775e-02
## 5-244579      3.409541e-03   1.104642e-02
## 5-244647      6.096596e-03   -7.276435e-04
## 5-244667      -2.361638e-03  1.888566e-02
## 5-244669      -3.058790e-02  -4.549118e-03
## 5-244732      3.357126e-02   3.543907e-02
## 5-244746      -1.681289e-02  4.210054e-03
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## 5-245114     -1.885333e-03  -8.115259e-03
## 5-245149      6.236820e-03   1.771815e-02
## 5-245211     -2.204470e-03  -1.948554e-02
## 5-245269      3.507708e-03   9.522526e-03
## 5-245288     -4.651141e-02  -3.086054e-02
## 5-245331     -5.091597e-03  -3.426836e-02
## 5-245460      1.860084e-03   2.393819e-02
## 5-245473     -2.366323e-02   1.121536e-02
## 5-245497      3.233738e-02   1.430441e-02
## 5-245497_2    -6.505651e-02  -2.811569e-02
## 5-245509      2.770279e-02  -9.612098e-03
## 5-245718      7.056354e-03   1.340882e-03
## 5-245727     -2.716022e-02  -2.731792e-02
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## 5-245866     -1.549711e-02   2.950429e-02
## 5-245890     -2.735548e-02  -5.690537e-03
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## 5-247025      1.473252e-02   1.170606e-02
## 5-247069      1.124037e-03  -6.469059e-03
## 5-247331      1.429871e-02   1.127585e-02
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## 5-247561      3.994871e-02 -1.478781e-02
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## 5-247627      2.076449e-02  9.194648e-03
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## 5-247666      2.086965e-02  2.003318e-03
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## 5-247729      -2.685480e-02 -1.293407e-02
## 5-247747      1.433162e-02  5.970453e-03
## 5-247852      2.427559e-03  5.492248e-02
## 5-247865      3.416266e-03  4.287993e-03
## 5-247885      -3.805952e-02 -3.922574e-02
## 5-247899      1.487848e-02  4.029477e-03
## 5-247989      2.865208e-03  5.341893e-02
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## 5-248031      3.213296e-02  9.328284e-03
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## 5-248167      -1.339975e-02 -7.692891e-02
## 5-248189      -1.892592e-02  3.700356e-02
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## 5-249154      -1.334303e-02 -3.727086e-03
## 5-249239      -4.829016e-02  7.513780e-02
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## 5-249577  2.780978e-03  8.149943e-03
## 5-249663 -5.112852e-03 -1.283881e-02
## 5-249683  4.550607e-02  1.588417e-02
## 5-249699  2.935307e-02 -1.201575e-02
## 5-249716  2.935307e-02 -1.201575e-02
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## 6-250070  6.059263e-02  1.499056e-02
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## 6-250318  1.278320e-02 -4.041578e-05
## 6-250398 -2.754843e-02  1.288549e-03
## 6-250411  2.861126e-02  5.563922e-02
## 6-250502 -2.813606e-02 -4.897132e-02
## 6-250528 -3.543052e-04  2.831784e-03
## 6-250587 -2.690810e-02  6.059867e-02
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## 6-250703  1.204433e-02  3.874811e-06
## 6-250726 -3.079650e-02 -3.214047e-02
## 6-250736 -2.723049e-02 -9.337456e-04
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## 6-251130 -2.871968e-02  1.748174e-02
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## 6-251281  5.236536e-02 -8.958260e-03
## 6-251307  1.768506e-02 -6.058644e-04
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## 6-251680 -3.654919e-02 -7.555911e-03
## 6-251684 -1.021030e-05 -4.362281e-03
## 6-251792 -2.010671e-02 -2.633826e-02
## 6-251858 -3.982682e-02 -3.759450e-03
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## 6-251953 -9.191043e-03 -6.974108e-03
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## 6-252063  3.243136e-02 -4.989108e-02
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## 6-252395  5.236536e-02 -8.958260e-03
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## 6-253884 -5.169852e-02 -8.547424e-03
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## 6-254354     -4.125053e-02  -1.789058e-03
## 6-254386     -9.513783e-02  -4.648371e-02
## 6-254438     -1.207326e-02  -4.194023e-02
## 6-254450     -3.031773e-02  -3.999294e-02
## 6-254512      1.757929e-02   6.391285e-02
## 6-254530     -5.277156e-03   3.204624e-03
## 6-254534      1.545228e-02  -2.318717e-03
## 6-254559      2.165176e-03  -1.125716e-01
## 6-254589      8.166068e-03  -1.125147e-03
## 6-254598      5.325141e-02   8.817391e-02
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## 6-254646     -4.688705e-03   3.863557e-03
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## 6-254695     -1.235698e-02   7.142795e-03
## 6-254775      7.729790e-03  -4.323666e-05
## 6-254806      7.145797e-02  -1.275597e-01
## 6-254832      1.127965e-02  -1.013958e-02
## 6-254859     -1.119639e-02   4.304364e-04
## 6-254906     -3.049980e-02  -3.160517e-02
## 6-254930      1.862799e-02   6.654707e-02
## 6-254961      9.137363e-03   1.292763e-02
## 6-254990     -2.382142e-03  -1.637186e-02
## 6-255125      3.597732e-03  -2.768773e-02
## 6-255181      6.881388e-03   1.862921e-02
## 6-255225     -3.661855e-03  -9.604493e-03
## 6-255229     -3.494379e-02  -2.079882e-02
## 6-255245      2.399117e-02  -4.383580e-02
## 6-255376      1.686198e-03  -2.253203e-02
## 6-255454     -5.274024e-03   1.834161e-03
## 6-255545     -1.464559e-02  -5.411729e-02
## 6-255569      3.528042e-03  -1.714070e-02
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## 6-255659      4.714158e-02  -1.653489e-02
## 6-255662      3.420990e-02  -2.357618e-02
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## 6-255786     -1.941905e-03   4.742768e-03
## 6-255957      1.887704e-02  -7.468592e-03
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## 6-255985     -1.521296e-02  -4.996592e-02
## 6-255995      3.019289e-02   7.513617e-02
## 6-256040      6.276048e-02   1.201513e-02
## 6-256077      1.367434e-02  -3.026505e-02
## 6-256118     -7.588815e-03   4.192314e-02
## 6-256165     -7.694287e-03   1.208926e-02
## 6-256182      1.363210e-02   2.557338e-03
## 6-256187      1.859933e-02  -4.395646e-03
## 6-256212     -8.858195e-02   5.950843e-03
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## 6-256529      5.530752e-02   7.131096e-02
## 6-256584      -2.797965e-03  -9.819741e-04
## 6-256585      4.313321e-02   -4.495321e-02
## 6-256606      7.867610e-02   5.814559e-04
## 6-256666      7.499233e-04   -2.495075e-02
## 6-256699      9.693997e-03   -5.758702e-02
## 6-256709      -8.043379e-03   1.277169e-02
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## 6-256840      -2.745297e-03   3.026539e-03
## 6-256941      -2.766856e-03   -4.947719e-04
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## 6-257135      -1.704192e-02   2.839228e-02
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## 6-257155      -3.528747e-02   -5.039602e-02
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## 6-257388      -6.180438e-03   8.561737e-03
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## 6-257517      -7.077242e-03   5.874128e-04
## 6-257526      -1.344584e-02   4.681095e-02
## 6-257534      -4.627505e-03   -3.686420e-03
## 6-257551      -6.526567e-03   7.623092e-03
## 6-257582      2.811875e-04   -7.985091e-03
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## 6-257943      -2.363621e-03   -1.147489e-03
## 6-257962      4.248182e-02   -3.610796e-02
## 6-257989      -4.423579e-03   1.925742e-02
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## 6-258456 -3.984874e-03 -3.907352e-03
## 6-258476 1.756047e-02 -6.854456e-04
## 6-258480 -4.616735e-03 -2.306721e-02
## 6-258501 9.749067e-03 2.257519e-02
## 6-258628 -9.428657e-03 4.125720e-05
## 6-258703 -2.658380e-03 -1.619848e-02
## 6-258723 -7.468860e-03 6.497964e-02
## 6-258729 -2.981215e-02 6.594420e-03
## 6-258760 -1.795165e-02 -9.411519e-03
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## 6-258839 2.341500e-03 -5.333104e-03
## 6-258856 -2.356455e-02 -2.619619e-02
## 6-258950 -1.207706e-02 4.440528e-02
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## 6-258999 8.047956e-05 8.447163e-03
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## 6-260857 5.865663e-05 1.230910e-02
## 6-260929 3.654121e-03 4.271754e-03
## 6-261033 -1.169966e-02 -1.212482e-03
## 6-261051 -1.154747e-02 -6.295188e-03
## 6-261118 3.158484e-02 8.647181e-03
## 6-261165 7.540443e-02 -1.197522e-04
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## 6-263589 -2.344712e-02 2.486361e-02
## 6-263594 7.802486e-02 -1.106209e-04
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## 6-264138 -3.137870e-02 -6.361936e-03
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## 6-265873      4.477906e-02 -3.653138e-02
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## 6-266226     -2.635208e-03  9.338952e-03
## 6-266238     -2.953481e-02 -3.043282e-02
## 6-266294      5.521352e-02 -5.469667e-02
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## 6-266829       2.976162e-02  7.275916e-03
## 6-266836      -1.958035e-02  6.568044e-02
## 6-266849      -1.318607e-02  9.071967e-03
## 6-266871       1.391188e-02  6.006904e-03
## 6-266875      -2.719879e-02 -1.554619e-02
## 6-266879       7.802486e-02 -1.106209e-04
## 6-266997      -4.572975e-03 -1.156659e-02
## 6-267004      -1.270549e-02 -7.718765e-03
## 6-267005       1.142802e-02  4.103167e-03
## 6-267106       4.333692e-02 -3.835561e-02
## 6-267124      -1.585436e-03 -6.129817e-03
## 6-267129      -4.572975e-03 -1.156659e-02
## 6-267260      -2.283939e-03  1.673547e-02
## 6-267284      -1.519533e-02 -3.972858e-03
## 6-267317       1.731610e-02  7.587115e-03
## 6-267358       1.564921e-02  4.972302e-03
## 6-267391       1.299086e-02  1.850245e-03
## 6-267529       6.707210e-03  4.896625e-04
## 6-267548      -9.141679e-03 -4.417238e-03
## 6-267602       1.577506e-02  4.409476e-03
## 6-267611      -1.621312e-02  1.364211e-02
## 6-267657      -6.344115e-03  7.837489e-03
## 6-267663       1.038344e-02  1.562321e-03
## 6-267719      -3.000407e-02  1.900586e-02
## 6-267730       2.044156e-03 -2.708787e-02
## 6-267777       9.060975e-03 -6.597485e-03
## 6-267804      -5.211574e-05 -8.635856e-03
## 6-267813       3.436700e-02  2.775864e-02
## 6-267840      -4.120385e-03  3.524916e-03
## 6-267841      -1.613993e-02 -5.417849e-02
## 6-267855      -8.886672e-03 -6.209050e-03
## 6-267883      -4.706335e-02  6.762744e-03
## 6-267896       9.511728e-03 -7.155900e-03
## 6-267933       1.636068e-03  3.986926e-02
## 6-267940      -2.541902e-03  9.589106e-03
## 6-268026      -1.464915e-02 -5.483962e-02
## 6-268029      -2.157373e-02 -7.099451e-04
## 6-268041      -1.056677e-02  8.001555e-03
## 6-268082       1.283550e-02  3.484329e-02
## 6-268173      -1.001912e-02 -7.097514e-03
## 6-268194      -1.166516e-02 -5.679338e-02
## 6-268208       4.448487e-04  3.341989e-02
## 6-268218      -4.009352e-02 -3.816206e-02
## 6-268299       1.981467e-02  4.560051e-03
## 6-268356       5.011408e-03 -2.296348e-04
## 6-268379      -3.107208e-02 -3.515221e-02
## 6-268608       7.771073e-03  3.723450e-03
## 6-268610      -1.359502e-02 -1.922767e-02
## 6-268683       3.846964e-02  3.087753e-02
## 6-268708      1.038163e-03 -8.779807e-03

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## 6-268747      1.851506e-03  4.014015e-02
## 6-268758      -4.350700e-05  -6.137240e-03
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## 6-268896      9.340004e-03  -4.625123e-03
## 6-268915      -8.052580e-03  -3.654143e-03
## 6-268920      4.873678e-02  -2.854538e-02
## 6-268957      1.998615e-02  3.437004e-02
## 6-268962      1.082623e-02  -1.047632e-03
## 6-268977      2.164599e-02  2.680506e-03
## 6-269002      6.878552e-04  -4.916281e-03
## 6-269058      -9.459107e-03  2.615429e-02
## 6-269060      1.082623e-02  -1.047632e-03
## 6-269083      -1.906165e-03  3.386228e-03
## 6-269163      -1.716395e-02  5.212720e-02
## 6-269195      2.778522e-03  -8.506608e-03
## 6-269210      2.163427e-02  2.032471e-03
## 6-269233      -3.315612e-03  8.043210e-03
## 6-269256      -1.866019e-02  -9.501545e-04
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## 6-269376      1.905916e-03  5.916479e-03
## 6-269433      1.337544e-02  5.019783e-03
## 6-269488      4.604057e-03  1.346104e-02
## 6-269495      1.082268e-02  -1.623228e-03
## 6-269507      2.047792e-02  2.166350e-03
## 6-269569      -3.801625e-02  2.630452e-04
## 6-269593      -1.227579e-03  -2.509225e-02
## 6-269602      -1.870213e-02  -1.931578e-02
## 6-269633      1.277143e-04  -1.844547e-02
## 6-269650      -2.891883e-03  8.088667e-03
## 6-269740      -1.466588e-03  -6.201560e-03
## 6-269794      9.225815e-04  -5.248943e-03
## 6-269800      -9.338533e-03  3.861921e-03
## 6-269862      -7.941060e-03  -3.137168e-02
## 6-269871      2.142794e-02  3.521477e-02
## 6-269919      2.679418e-03  -2.122237e-02
## 6-269945      -1.262664e-02  3.761765e-02
## 6-270013      -9.338533e-03  3.861921e-03
## 6-270014      -1.092607e-01  -6.109316e-02
## 6-270054      -1.125734e-03  -3.525431e-03
## 6-270088      1.036839e-02  -3.792639e-03
## 6-270095      3.651527e-02  -1.203901e-02
## 6-270158      -2.876702e-03  -1.003916e-02
## 6-270166      2.658601e-03  2.759436e-03
## 6-270173      5.504200e-02  3.030436e-02
## 6-270212      4.574283e-02  -1.644371e-02
## 6-270224      7.802486e-02  -1.106209e-04
## 6-270250_2     1.036839e-02  -3.792639e-03
## 6-270260      -2.295884e-02  2.315728e-02
## 6-270323      -2.295884e-02  2.315728e-02
## 6-270330      1.098637e-02  -6.917774e-04
## 6-270436      -1.138492e-03  -7.268978e-03

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## 6-270438      1.049549e-02  3.169307e-03
## 6-270458     -4.827662e-02 -2.479550e-02
## 6-270465      2.128538e-03  7.916674e-03
## 6-270521      4.987926e-03 -3.373790e-03
## 6-270535     -1.978869e-02 -5.307077e-03
## 6-270563     -2.673128e-02  4.702622e-03
## 6-270564      1.049549e-02  3.169307e-03
## 6-270589      7.802486e-02 -1.106209e-04
## 6-270608     -7.530353e-03  6.732776e-03
## 6-270617     -3.131871e-03 -9.128312e-03
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## 6-270751_2    2.477796e-03  8.476245e-03
## 6-270797     -2.890746e-02 -1.912784e-02
## 6-270798      1.087669e-02 -3.621042e-03
## 6-270824      1.922560e-02 -6.171020e-02
## 6-270872      9.225815e-04 -5.248943e-03
## 6-270917      2.809374e-03 -1.048788e-02
## 6-270929      1.139082e-02  1.093930e-03
## 6-270964     -1.060208e-02 -3.603191e-03
## 6-270966      1.373703e-02  3.029512e-02
## 6-271190      4.574283e-02 -1.644371e-02
## 6-271219      1.985765e-02  7.393487e-03
## 6-271273     -1.421469e-02  2.331005e-02
## 6-271282      1.271912e-02  3.327609e-04
## 6-271365     -2.948401e-02 -2.352734e-02
## 6-271373      3.352398e-02 -5.372658e-02
## 6-271426      1.038147e-02 -3.110189e-03
## 6-271540      1.118817e-02 -1.640516e-03
## 6-271603     -1.677617e-02  4.047955e-02
## 6-271612      3.352398e-02 -5.372658e-02
## 6-271719      1.455590e-02  2.138084e-02
## 6-271756      1.064506e-02  1.351665e-03
## 6-271782      9.225815e-04 -5.248943e-03
## 6-271896      1.246152e-02 -1.347530e-03
## 6-271916_2   -1.354294e-02 -8.737652e-03
## 6-272037      9.293094e-03 -1.930120e-03
## 6-272054     -2.723383e-02  1.363920e-03
## 6-272107      1.683643e-02  4.585537e-02
## 6-272137     -1.083530e-02  3.264564e-02
## 6-272152     -4.408221e-02 -4.592029e-02
## 6-272174     -1.793985e-02  1.235236e-02
## 6-272211     -2.418372e-03  1.055478e-02
## 6-272247      1.802071e-03 -5.639532e-03
## 6-272286     -4.471461e-03  1.647580e-02
## 6-272305     -6.878038e-02 -4.243557e-02
## 6-272328      1.495514e-02  3.183255e-03
## 6-272355     -2.418372e-03  1.055478e-02
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## 6-272373     -3.708861e-03  2.772650e-03
## 6-272387     -2.217475e-03 -1.128003e-02
## 6-272572      1.143552e-02 -1.272712e-03
## 6-272601      1.892778e-03 -6.001724e-03
## 6-272602      1.269703e-02 -1.241064e-02
## 6-272624     -6.053127e-03 -2.676218e-03

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## 6-272654      1.195500e-02  3.947675e-03
## 6-272692      1.219486e-02  1.009601e-03
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## 6-272733      3.561824e-03  8.338468e-03
## 6-272746      -8.655604e-03 -1.920146e-02
## 6-272750      5.244130e-03  -4.342932e-02
## 6-272816      -8.236761e-03 -4.328288e-03
## 6-272986      3.988487e-03  4.008512e-02
## 6-272997      9.244968e-02  -9.160891e-03
## 6-273033      1.382312e-02  6.816096e-04
## 6-273089      -3.717737e-02 -2.326792e-03
## 6-273101      7.317182e-03  1.821962e-03
## 6-273110      1.870930e-02  5.059468e-03
## 6-273131      -9.377717e-03 -3.651268e-02
## 6-273151      -9.234044e-03  9.943627e-03
## 6-273238      1.013197e-02  4.552363e-03
## 6-273245      -1.865911e-02  1.512098e-02
## 6-273370      1.192198e-03  -5.300068e-03
## 6-273409      1.143552e-02  -1.272712e-03
## 6-273442      3.850012e-03  -5.125557e-03
## 6-273480      -6.012544e-03 -2.570133e-03
## 6-273482      1.862677e-03  -8.773942e-03
## 6-273684      1.352282e-02  -4.848577e-04
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## 6-273722      -4.235029e-03 -3.018028e-03
## 6-273764      6.298402e-03  -4.913904e-03
## 6-273835      -1.926001e-02 -1.167575e-03
## 6-273866      -2.083997e-02  1.394706e-03
## 6-273953      -3.655950e-02 -2.974920e-02
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## 6-274268      -6.162999e-03 -1.678680e-03
## 6-274285      -2.572230e-02  6.161379e-02
## 6-274313      -6.162999e-03 -1.678680e-03
## 6-274332      3.647452e-02  6.766647e-02
## 6-274393      1.429376e-02  4.272859e-03
## 6-274409      -1.303011e-03 -5.829944e-03
## 6-274428      1.122863e-02  3.769430e-03
## 6-274443      -5.570330e-03  2.179850e-02
## 6-274460      -3.577831e-02 -1.727082e-02
## 6-274489      -9.402016e-03 -3.936318e-02
## 6-274495      -4.193903e-02 -1.479358e-03
## 6-274501      -2.375204e-02 -3.084261e-02
## 6-274504      -1.934165e-02  5.077410e-02
## 6-274522      1.090672e-02  -8.227097e-07
## 6-274525      1.932434e-03  -4.796110e-03
## 6-274532      1.099977e-02  4.635170e-03

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## 6-274559 -3.577831e-02 -1.727082e-02
## 6-274570 2.052365e-02 -4.922346e-02
## 6-274581 1.830984e-02 -6.896852e-03
## 6-274616 7.360884e-03 6.097530e-03
## 6-274623 -2.287032e-02 -3.338392e-03
## 6-274735 4.547398e-03 3.143769e-02
## 6-274774 -4.636758e-02 -3.421337e-03
## 6-274872 4.701490e-02 -7.377100e-03
## 6-274882 4.120691e-03 -1.164353e-02
## 6-274901 -2.339038e-02 1.123027e-03
## 6-274924 3.299148e-02 1.957580e-03
## 6-274928 -3.188114e-02 -2.347129e-02
## 6-274936 -8.689217e-04 8.409612e-02
## 6-274943 3.484894e-02 6.350859e-02
## 6-274948 1.692868e-02 1.128600e-03
## 6-274953 3.988152e-03 -2.173661e-02
## 6-275099 -9.587346e-03 -3.772799e-02
## 6-275161 -2.156404e-03 -5.601544e-03
## 6-275215 -1.443437e-02 -2.509355e-03
## 6-275234 -2.132261e-02 -8.351159e-02
## 6-275240 -6.381871e-04 -7.347075e-03
## 6-275266 1.291550e-02 5.376150e-03
## 6-275396 7.954127e-03 -3.409608e-02
## 6-275425 2.751915e-03 2.457766e-03
## 6-275431 2.657590e-02 6.970439e-03
## 6-275441 -2.822276e-02 -1.261422e-02
## 6-275482 2.457433e-03 1.767497e-02
## 6-275623 1.739559e-03 -3.735434e-03
## 6-275661 -4.206594e-04 -4.203485e-03
## 6-275684 2.647720e-03 6.162769e-03
## 6-275718 1.039235e-03 -1.729377e-02
## 6-275822 1.039235e-03 -1.729377e-02
## 6-275916 4.489775e-02 -7.289396e-03
## 6-275917 1.078333e-04 -1.461215e-03
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## 6-276077 7.117250e-03 2.540338e-02
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## 6-276163 -4.633149e-03 -1.027544e-02
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## 6-276257 2.428031e-03 1.825129e-02
## 6-276290 3.235063e-03 3.168338e-03
## 6-276380 -5.320950e-02 -4.230788e-02
## 6-276389 5.530305e-03 1.601063e-02
## 6-276405 1.682997e-03 -8.455305e-03
## 6-276443 -7.100341e-03 3.473036e-02
## 6-276443_2 8.154078e-04 -7.943322e-04
## 6-276492 1.755002e-03 7.194097e-03
## 6-276492_2 -6.690116e-03 3.841566e-03
## 6-276496 -3.269555e-02 -4.336275e-03
## 6-276511 8.823126e-03 2.523722e-02
## 6-276517 4.181389e-03 9.827282e-03
## 6-276548 -3.122883e-03 6.886918e-03
## 6-276551 8.154078e-04 -7.943322e-04
## 6-276554 -2.948544e-02 -2.255657e-02

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## 6-276910     -6.292951e-02  2.464745e-02
## 6-276914      2.050108e-04  5.332207e-03
## 6-276924     -1.808484e-02  2.237638e-03
## 6-277025      2.085517e-02  7.634878e-03
## 6-277087     -4.467900e-03  2.069692e-02
## 6-277092     -4.169832e-03  -5.346027e-03
## 6-277165      2.513808e-03  1.019393e-02
## 6-277212      8.240918e-03  1.177758e-02
## 6-277232      3.859103e-03  -1.410655e-02
## 6-277294      1.693207e-03  -2.393707e-03
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## 6-277398      3.136219e-02  2.525132e-02
## 6-277406     -3.560058e-03  -8.417651e-03
## 6-277418      6.162489e-03  -6.718869e-03
## 6-277440     -1.691028e-02  -7.274545e-04
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## 6-277543     -5.113957e-04  3.647284e-03
## 6-277553     -1.182998e-03  -9.819777e-03
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## 6-277654      1.776121e-03  -1.838060e-02
## 6-277694     -5.144873e-03  -1.010242e-02
## 6-277698      1.116134e-02  2.880540e-02
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## 6-277719      2.837297e-03  -2.700543e-02
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## 6-277831     -5.144873e-03  -1.010242e-02
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## 6-278161     -2.131401e-03  2.721512e-03
## 6-278165     -1.831908e-02  1.298074e-02
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## 6-278316      8.631369e-03  1.232412e-02
## 6-278453     -1.567369e-02  3.465106e-02
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## 6-278557      4.160670e-02  3.217214e-02
## 6-278633      3.441627e-03  3.306707e-03
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## 6-278697      4.048611e-03  -1.818539e-02
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## 6-278737      2.874568e-03  1.795062e-02

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## 6-278864      1.557583e-03  -2.840844e-03
## 6-278882      -6.210925e-03  1.371888e-02
## 6-278901      -1.056562e-02  1.000463e-02
## 6-278960      4.858729e-03  2.377237e-02
## 6-278966      -5.158046e-02  2.237855e-02
## 6-278997      3.126634e-03  -1.656378e-03
## 6-279021      4.020440e-03  7.317285e-03
## 6-279028      -5.273939e-02  -1.333320e-01
## 6-279085      -2.340875e-02  1.225429e-02
## 6-279090      -1.908791e-02  5.012059e-03
## 6-279211      5.048360e-04  -1.374990e-02
## 6-279219      3.541195e-02  9.302615e-02
## 6-279261      -1.680200e-02  -2.164495e-02
## 6-279295      1.711214e-02  2.365043e-03
## 6-279296      5.607684e-03  -7.308543e-03
## 6-279337      -9.869359e-03  5.150279e-02
## 6-279447      -4.084524e-03  1.027906e-02
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## 6-279562      1.629175e-02  -4.146291e-03
## 6-279660      2.250320e-03  -1.085035e-02
## 6-279661      7.314158e-03  -2.776747e-03
## 6-279687      -2.629856e-03  5.162191e-03
## 6-279697      -1.374102e-03  3.730706e-03
## 6-279737      1.847296e-03  -6.708515e-03
## 6-279740      -2.462056e-03  1.029577e-04
## 6-279755      -2.334446e-02  1.138496e-02
## 6-279818      -1.834883e-02  -1.278033e-03
## 6-279838      1.630704e-03  -3.976730e-03
## 6-279840      1.629175e-02  -4.146291e-03
## 6-280013      -7.000405e-02  -6.419565e-02
## 6-280109      2.619847e-02  3.048361e-02
## 6-280116      2.590333e-02  5.423720e-03
## 6-280127      -2.501519e-03  -2.408882e-04
## 6-280181      7.545082e-02  -6.728759e-05
## 6-280210_2    -1.779956e-03  9.769878e-03
## 6-280240      -1.300852e-02  -2.348360e-02
## 6-280281      -8.857646e-03  2.390806e-02
## 6-280310      2.827274e-03  8.750739e-03
## 6-280320      3.278654e-03  1.275744e-02
## 6-280381      -1.207544e-02  1.481389e-02
## 6-280395      -1.756864e-02  7.331346e-04
## 6-280469      1.417271e-02  2.656018e-03
## 6-280519      -5.887580e-02  -4.030098e-02
## 6-280589      -1.793603e-02  2.001789e-02
## 6-280602      -6.155160e-03  -4.812239e-04
## 6-280642      -1.109489e-02  1.349169e-02
## 6-280667      -2.578931e-02  1.178794e-02
## 6-280716      1.002609e-03  -4.079686e-03
## 6-280788      3.857240e-03  1.233896e-02
## 6-280822      -1.495756e-02  2.436619e-03
## 6-280822_2   9.762260e-04  -5.123437e-03

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## 6-280865 -9.047758e-03 -3.900614e-03
## 6-280869 -3.360264e-02 -4.483533e-03
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## 6-280954 -1.253790e-03  3.519336e-04
## 6-281006 -9.241386e-03  1.903767e-03
## 6-281179  8.974246e-03  3.798957e-03
## 6-281208  4.129757e-03 -4.596812e-03
## 6-281267 -1.398740e-02  5.008195e-03
## 6-281283  4.491689e-02 -1.525238e-02
## 6-281347 -2.708530e-02  1.050132e-02
## 6-281354 -1.588763e-02 -1.721672e-02
## 6-281354_2 -4.506213e-02 -1.353695e-02
## 6-281383 -3.530531e-02 -8.168500e-04
## 6-281388 -7.235014e-03 -1.819182e-03
## 6-281391 -1.149119e-02 -3.486448e-03
## 6-281395  2.152807e-02 -4.494419e-03
## 6-281423  1.492995e-02  5.114812e-03
## 6-281456  9.156102e-03  1.289873e-02
## 6-281493  9.110759e-03 -3.820704e-03
## 6-281499  1.675296e-03 -1.425827e-02
## 6-281550  8.857075e-02 -7.175973e-02
## 6-281579 -1.520636e-05 -9.430944e-03
## 6-281603  1.706125e-02 -5.875546e-03
## 6-281624  6.425866e-04 -1.072434e-02
## 6-281658  1.675296e-03 -1.425827e-02
## 6-281737  8.547088e-02 -6.935062e-02
## 6-281769  1.500133e-02 -5.373306e-03
## 6-281801 -8.717129e-04 -1.014221e-02
## 6-281835 -2.344023e-02  1.889224e-02
## 6-281839  8.431728e-04  7.974465e-03
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## 6-281895 -2.708530e-02  1.050132e-02
## 6-282042  2.051638e-04 -1.692572e-02
## 6-282059  2.368903e-02  1.049100e-02
## 6-282069 -2.988650e-02 -1.217797e-02
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## 6-282153 -8.583670e-03 -2.306772e-03
## 6-282156  1.500133e-02 -5.373306e-03
## 6-282184 -3.508779e-03 -9.924079e-03
## 6-282216  7.984399e-02 -6.504320e-02
## 6-282250  1.800785e-01 -4.955099e-04
## 6-282276  1.243429e-02  1.614368e-02
## 6-282277  1.719416e-02  4.302430e-03
## 6-282325 -3.508779e-03 -9.924079e-03
## 6-282363  7.934408e-03  3.551882e-03
## 6-282460 -2.005136e-02 -1.032911e-02
## 6-282462 -6.579112e-03  1.283806e-02
## 6-282527 -4.738253e-02 -3.106355e-02
## 6-282535 -6.257693e-03  1.286579e-02
## 6-282573 -4.697744e-02 -3.873981e-02
## 6-282611  8.980345e-02 -6.868058e-02
## 6-282733  6.107532e-02 -4.195663e-02
## 6-282737  1.892860e-03 -5.066552e-03

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## 6-282764      2.204356e-02  5.799501e-03
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## 6-282803      -2.013077e-02  -3.111707e-03
## 6-282881      -5.544310e-02  -1.186770e-01
## 6-282903      -2.311761e-02  -7.783461e-03
## 6-282957      1.076732e-02  2.513993e-02
## 6-282962      -1.086391e-02  1.756874e-02
## 6-283020      -5.673938e-03  -4.263327e-04
## 6-283029      -3.451397e-02  -2.091157e-03
## 6-283037      -4.453642e-03  -1.268501e-02
## 6-283084      1.621620e-03  -3.998934e-03
## 6-283086      8.744449e-02  -6.896258e-02
## 6-283177      3.682425e-02  -2.940558e-02
## 6-283181      -1.272667e-02  -9.879560e-03
## 6-283234      2.318233e-03  1.065562e-02
## 6-283259      1.267459e-02  4.076230e-03
## 6-283263      -2.114053e-03  6.804606e-03
## 6-283289      -1.113942e-02  1.807734e-02
## 6-283473      -3.592571e-02  3.556177e-03
## 6-283549      4.250596e-02  -4.238999e-02
## 6-283628      1.595133e-02  3.559085e-03
## 6-283691      -3.346716e-02  -3.185795e-03
## 6-283772      3.310438e-02  -3.364931e-02
## 6-283803      1.099302e-02  2.582310e-02
## 6-283825      -6.673206e-03  -2.624561e-02
## 6-283887      1.155846e-02  1.094118e-02
## 6-283902      1.727006e-03  -3.882547e-03
## 6-283947      4.033369e-02  -4.001875e-02
## 6-283953      1.630116e-02  1.129830e-02
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## 6-284126      -1.212464e-02  -1.277832e-02
## 6-284132      1.176128e-02  4.504689e-03
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## 6-284164      -8.409845e-03  1.096907e-02
## 6-284177      1.595133e-02  3.559085e-03
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## 6-284236      -3.374301e-02  -3.975485e-02
## 6-284239      3.785177e-03  -5.777263e-03
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## 6-284294      2.562411e-02  -9.509789e-03
## 6-284426      9.168289e-03  -4.643122e-03
## 6-284466      2.242746e-02  -1.034977e-02
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## 6-284555      1.403346e-02  -1.495566e-01
## 6-284639      -2.176586e-03  8.169302e-03
## 6-284642      -1.465159e-02  1.745513e-02
## 6-284693      1.152253e-02  4.729934e-03
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## 6-284966      1.053212e-02  1.370443e-03

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## 6-285038 8.532654e-02 1.104479e-01
## 6-285085 4.295003e-02 1.423772e-02
## 6-285128 -1.466408e-02 2.090534e-02
## 6-285164 -4.501049e-03 -2.770669e-03
## 6-285167 -8.315808e-03 -2.878117e-03
## 6-285185 3.873800e-03 -5.859459e-03
## 6-285254 2.282177e-02 -1.039912e-02
## 6-285298 7.140711e-03 4.072750e-03
## 6-285374 -2.018668e-04 -2.470072e-02
## 6-285433 3.999437e-02 -3.222972e-02
## 6-285475 -2.093204e-02 -2.232076e-03
## 6-285549 -1.576736e-02 -1.684905e-02
## 6-285558 -4.780708e-03 1.974599e-02
## 6-285613 -4.485322e-04 -9.366093e-03
## 6-285615 -1.850336e-02 3.718726e-03
## 6-285711 -1.850336e-02 3.718726e-03
## 6-285791 -6.276985e-04 3.053481e-03
## 6-285841 -3.446339e-02 8.416320e-03
## 6-285850 -9.602077e-03 2.828314e-02
## 6-285874 -1.308216e-02 2.315372e-02
## 6-285893 4.906442e-02 -2.455989e-02
## 6-285953 -1.012095e-02 -7.705938e-02
## 6-286031 3.903896e-02 1.898317e-02
## 6-286032 -1.414981e-02 1.100035e-02
## 6-286045 3.348871e-03 2.851223e-02
## 6-286097 5.384675e-02 -4.199188e-02
## 6-286176 1.577393e-02 3.803776e-03
## 6-286189 -7.198853e-04 -1.039775e-02
## 6-286194 4.906442e-02 -2.455989e-02
## 6-286229 3.727785e-02 -3.434880e-03
## 6-286314 2.300072e-02 9.048671e-03
## 6-286319 -8.340510e-03 4.837328e-02
## 6-286409 -2.436791e-02 -5.022891e-04
## 6-286427 -1.436364e-02 -6.214471e-03
## 6-286475 3.457488e-03 7.608745e-03
## 6-286476 2.245544e-02 -1.030931e-02
## 6-286582 8.032210e-02 -5.340474e-04
## 6-286583 -1.847543e-02 2.638786e-03
## 6-286625 1.400202e-03 -2.136519e-02
## 6-286661 1.180990e-02 -5.137184e-03
## 6-286777 -9.862611e-03 1.567241e-02
## 6-286780 1.160781e-02 4.261578e-02
## 6-286825 2.613301e-02 -7.403612e-03
## 6-286883 4.457877e-02 -3.675122e-02
## 6-286941 1.117613e-02 1.267038e-03
## 6-286987 1.298043e-03 -1.518456e-02
## 6-287014 -3.658145e-02 1.619397e-01
## 6-287167 6.366232e-02 -6.496363e-02
## 6-287208 1.217998e-02 -6.925354e-03
## 6-287241 6.366232e-02 -6.496363e-02
## 6-287279 -2.363146e-02 5.261095e-03
## 6-287340 1.557827e-02 4.554442e-03
## 6-287352 1.630624e-02 2.452583e-02

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## 6-287421      1.518413e-02  4.915121e-03
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## 6-287490      3.206384e-02 -4.064945e-02
## 6-287599      8.032210e-02 -5.340474e-04
## 6-287608     -1.940506e-02 -8.947609e-03
## 6-287633     -1.102293e-02 -2.666221e-03
## 6-287666      3.551388e-02  1.113696e-02
## 6-287681      1.642922e-02  4.467816e-02
## 6-287682     -5.137928e-03 -1.216490e-02
## 6-287697     -2.901006e-02 -4.068532e-02
## 6-287769      1.638887e-03  1.034338e-02
## 6-287774      3.828148e-03  1.168215e-02
## 6-287793      1.412586e-02  2.597213e-02
## 6-287824      4.398717e-02 -3.376596e-02
## 6-287984     -6.181380e-03  3.224387e-02
## 6-288075     -2.232512e-02 -7.627849e-03
## 6-288126      1.356511e-03 -1.004826e-02
## 6-288132      3.828148e-03  1.168215e-02
## 6-288187     -4.891782e-02 -5.230133e-02
## 6-288233      1.228920e-03 -7.295935e-03
## 6-288250      3.828148e-03  1.168215e-02
## 6-288277     -7.584885e-03  1.063929e-02
## 6-288328      1.139597e-02 -4.965961e-03
## 6-288415     -3.514529e-03  3.127951e-03
## 6-288458      9.549832e-04  7.893743e-03
## 6-288471     -1.033322e-02  2.395843e-02
## 6-288486     -6.424115e-03  1.414112e-03
## 6-288504     -2.828818e-02  2.343161e-02
## 6-288507      7.609653e-02  6.998845e-04
## 6-288546     -4.186708e-02 -7.014342e-03
## 6-288599      1.985909e-03  8.548028e-03
## 6-288664     -5.587834e-03  1.094278e-02
## 6-288737     -4.050175e-02  2.266683e-02
## 6-288753     -1.176129e-01 -8.978683e-02
## 6-288787     -2.083139e-02  4.842211e-03
## 6-288829      8.446794e-03  1.460924e-02
## 6-288837      1.807503e-02  3.732868e-02
## 6-288857     -1.071494e-02 -3.689660e-02
## 6-288861     -2.037730e-03 -2.250512e-02
## 6-288948      1.215249e-02  7.674221e-03
## 6-288976     -4.227894e-03  3.731327e-03
## 6-289004     -2.084259e-03  1.963077e-02
## 6-289086      2.127215e-02  4.760933e-02
## 6-289106      4.155658e-02  3.196624e-03
## 6-289155      2.092076e-02  4.742558e-02
## 6-289242      5.045140e-02 -3.938020e-02
## 6-289266      1.016942e-03 -8.145748e-03
## 6-289298     -1.740705e-02  4.873494e-03
## 6-289306     -1.355981e-03  1.753145e-02
## 6-289307      1.180994e-02  6.609386e-03
## 6-289327      7.431708e-03 -6.160669e-03
## 6-289335      1.906819e-02  1.708206e-03
## 6-289364     -2.083139e-02  4.842211e-03
## 6-289412      2.171448e-03 -3.067670e-02

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## 6-289521 -4.371821e-02 -5.524737e-02
## 6-289562 -5.938384e-03  9.471843e-03
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## 6-289698 -3.537670e-02  1.197291e-02
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## 6-289945  1.282010e-03 -6.685718e-03
## 6-289992 -1.529415e-02  4.904233e-02
## 6-290035  1.282010e-03 -6.685718e-03
## 6-290039 -1.470962e-02  2.365671e-02
## 6-290113  1.095444e-02  2.046477e-03
## 6-290153  1.199944e-02  5.612055e-03
## 6-290160  6.001610e-03 -1.167624e-03
## 6-290198  1.011494e-02 -2.528587e-05
## 6-290272  8.631369e-03  1.232412e-02
## 6-290372 -7.599285e-02 -6.087609e-02
## 6-290404 -5.007807e-03 -9.381512e-03
## 6-290471  2.995708e-03  1.303600e-02
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## 6-290584  1.274378e-02  3.294088e-02
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## 6-290637 -1.330758e-02  3.366980e-02
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## 6-290731  7.171757e-03  6.948314e-03
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## 6-290811  5.652949e-04  2.622317e-02
## 6-290828 -2.700397e-04 -7.525197e-03
## 6-290934  2.590393e-02 -2.380268e-02
## 6-290957  4.803697e-02 -5.637848e-02
## 6-291033  1.553210e-02 -8.196074e-04
## 6-291071  1.220027e-02  6.431656e-03
## 6-291169 -4.916182e-02 -5.726382e-03
## 6-291269  1.568575e-02 -1.727985e-03
## 6-291324 -3.599508e-02 -9.070051e-03
## 6-291397 -6.071035e-03 -2.523124e-03
## 6-291490 -6.973484e-02  5.198991e-03
## 6-291525 -1.676511e-02  2.194261e-02
## 6-291566 -1.045759e-03 -1.221167e-02
## 6-291620 -6.278125e-03 -3.059441e-03
## 6-291693  3.133088e-03 -5.689472e-03
## 6-291695  4.193993e-03  3.211752e-02
## 6-291710  1.104515e-02  2.676341e-03
## 6-291714  7.166328e-02 -3.742762e-02
## 6-291806  5.333595e-04  4.454566e-03
## 6-291812 -1.665314e-02 -1.717543e-02
## 6-291946 -2.842693e-02 -1.607195e-02
## 6-291986  1.221530e-02 -3.030394e-03
## 6-292001 -2.197090e-02  5.406260e-02
## 6-292011  5.384832e-02 -3.915959e-04
## 6-292028 -2.504076e-03 -1.350915e-02
## 6-292029  1.664412e-02  1.237154e-03
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## 6-292147      -1.513708e-02 -1.870939e-02
## 6-292162      7.471207e-04 -1.851130e-03
## 6-292174      -4.726835e-02 -1.161642e-02
## 6-292204      -3.370769e-03 -1.296831e-03
## 6-292218      -3.186595e-03 -1.466453e-02
## 6-292265      1.838018e-02  3.381407e-02
## 6-292284      1.509898e-02  3.580563e-03
## 6-292382      1.024172e-02 -2.741058e-03
## 6-292396      4.413548e-03 -1.059446e-02
## 6-292397      8.658965e-03  2.061774e-02
## 6-292398      -7.151409e-02  1.918559e-03
## 6-292417      5.549988e-02  2.881552e-03
## 6-292429      -8.647290e-02 -3.078863e-02
## 6-292497      3.405180e-03  7.052868e-03
## 6-292638      3.278911e-02 -2.984888e-02
## 6-292642      3.373035e-03  3.418192e-02
## 6-292648      7.643860e-03  2.037345e-02
## 6-292673      2.413646e-03  4.573522e-03
## 6-292676      4.413548e-03 -1.059446e-02
## 6-292686      4.747950e-02 -3.625767e-02
## 6-292708      -8.449525e-03  1.662831e-02
## 6-292723      2.413646e-03  4.573522e-03
## 6-292735      1.967734e-03 -7.791589e-03
## 6-292801      1.204911e-02  4.719773e-03
## 6-292855      1.747906e-02  4.611451e-02
## 6-292872      6.123240e-02  2.076205e-02
## 6-292876      5.070230e-03 -3.419773e-02
## 6-292918      -1.914261e-03 -6.599482e-03
## 6-292999      -2.730692e-02 -3.009764e-02
## 6-293025      -2.237507e-02 -7.253721e-03
## 6-293047      8.506390e-03  2.298126e-02
## 6-293049      -2.254114e-03 -1.299591e-02
## 6-293092      -2.546263e-03 -1.186796e-02
## 6-293218      -5.830559e-02  2.071026e-02
## 6-293263      -1.636149e-03  1.400888e-02
## 6-293287      8.506390e-03  2.298126e-02
## 6-293313      7.884147e-03  3.047893e-02
## 6-293315      -4.250588e-03 -2.007982e-02
## 6-293342      -2.528337e-02  2.956511e-02
## 6-293408      2.567836e-02  4.498151e-03
## 6-293430      1.767462e-02  4.311170e-03
## 6-293505      3.278911e-02 -2.984888e-02
## 6-293700      -1.658300e-02  7.512094e-03
## 6-293723      3.182167e-02 -2.816674e-02
## 6-293748      -5.901812e-03 -7.895567e-04
## 6-293899      -3.144265e-02 -3.877403e-02
## 6-293903      1.485661e-03  9.869485e-04
## 6-293959      -5.468163e-04  2.848001e-03
## 6-294017      -1.115236e-02  3.801888e-02
## 6-294037      4.976742e-04  1.917420e-02
## 6-294046      1.671403e-02  1.269327e-02
## 6-294078      3.784432e-02  9.566559e-03

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## 6-294137      -1.104830e-02 -6.711742e-02
## 6-294146      -3.399515e-02 -4.203845e-02
## 6-294150      3.359749e-03 -2.104097e-03
## 6-294173      -1.326872e-03 -6.154815e-03
## 6-294193      1.964667e-02  3.537126e-02
## 6-294200      -7.468581e-03  5.621487e-03
## 6-294247      -1.508301e-01 -4.430591e-02
## 6-294249      4.566057e-03 -9.417951e-03
## 6-294252      -4.936583e-03 -2.228140e-02
## 6-294263      2.802903e-03 -1.332839e-02
## 6-294308      -1.223983e-02 -6.402477e-02
## 6-294323      2.811438e-03  8.824363e-04
## 6-294425      -1.326872e-03 -6.154815e-03
## 6-294430      -2.384558e-02  5.149867e-03
## 6-294492      -1.525086e-02  1.641833e-03
## 6-294514      1.247027e-01 -3.758365e-02
## 6-294542      8.482797e-03  2.743751e-04
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## 6-294776      -4.193722e-02 -5.528134e-03
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## 6-294874      3.281379e-03  6.116947e-04
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## 6-295007      -3.925333e-03 -2.103572e-02
## 6-295035      1.616818e-02  4.279296e-02
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## 6-295090      -1.271770e-02  3.101286e-02
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## 6-295150      -1.889468e-02 -7.628510e-03
## 6-295165      1.541017e-03 -5.495063e-03
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## 6-295365      -2.391281e-03  5.340557e-02
## 6-295412      1.961977e-03 -3.162997e-03
## 6-295415      -1.310324e-03  5.039813e-03
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## 6-295570      -3.363284e-02  4.382721e-02
## 6-295663      1.188007e-02 -4.254009e-02
## 6-295905      -3.211078e-02 -4.544813e-02
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## 6-295938      -5.591270e-04  1.112768e-02

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## 6-296129      -1.080441e-02 2.554467e-02
## 6-296162      4.926855e-02  1.083397e-02
## 6-296199      -2.444439e-03 -1.044949e-02
## 6-296274      6.811687e-03  4.026367e-03
## 6-296299      7.454271e-03  4.393099e-03
## 6-296303      -8.679184e-03 1.084403e-02
## 6-296305      1.970486e-03  3.067879e-02
## 6-296331      5.602225e-04  -1.016914e-03
## 6-296378      6.519607e-02  -1.062802e-01
## 6-296417      -2.451403e-03 -1.941770e-02
## 6-296433      1.130146e-02  -1.353780e-03
## 6-296456      -8.363119e-03 -4.572838e-02
## 6-296506      -2.158678e-02 -4.908919e-03
## 6-296586      -1.824265e-02  7.770936e-03
## 6-296594      8.375761e-04  -3.498082e-03
## 6-296613      2.611496e-03  1.798140e-02
## 6-296613_2    5.668075e-03  1.120443e-02
## 6-296613_3    -2.358518e-02 -5.170157e-03
## 6-296657      -8.998516e-02 -4.970215e-02
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## 6-296747      1.156306e-02  2.383293e-02
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## 6-297148      -9.367868e-03  2.926248e-02
## 6-297159      2.887718e-03  2.106822e-04
## 6-297242      -6.425666e-03 -1.002458e-03
## 6-297248      2.148183e-03  -3.646608e-02
## 6-297284      -2.044379e-02  2.402236e-02
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## 6-297510      -1.082091e-02  3.051676e-03
## 6-297532      -5.722011e-03  5.010846e-04
## 6-297541      -1.921400e-02  4.556912e-02
## 6-297576      -3.200549e-02 -3.913863e-02
## 6-297602      -3.009213e-02 -2.335120e-03
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## 6-297806      -1.130399e-02  2.416600e-02
## 6-297848      2.586471e-02  -1.290322e-02
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## 6-297933 -3.669620e-02 -1.107488e-02
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## 6-297998 3.639343e-03 1.518637e-02
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## 6-298026 1.262841e-02 6.426528e-03
## 6-298089 1.482017e-03 -5.200536e-03
## 6-298093 6.051725e-03 -3.778384e-03
## 6-298173 -3.277602e-03 8.750920e-03
## 6-298234 8.793933e-04 -1.609132e-02
## 6-298242 -1.082033e-02 2.578493e-02
## 6-298321 -4.121790e-03 -1.955102e-02
## 6-298375 8.793933e-04 -1.609132e-02
## 6-298416 5.199211e-02 -3.732456e-02
## 6-298432 -1.768127e-02 1.792995e-02
## 6-298599 -1.140766e-03 -5.396097e-04
## 6-298609 -1.171695e-02 2.681635e-02
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## 6-298644 -1.768127e-02 1.792995e-02
## 6-298649 -1.724639e-03 -5.520957e-03
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## 6-298782 -7.352382e-02 -1.723041e-02
## 6-298785 -6.356531e-02 -2.275173e-02
## 6-298803 -6.691510e-02 -1.765895e-02
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## 6-298830 -1.258745e-02 4.498323e-03
## 6-298849 9.582278e-03 3.346876e-03
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## 6-298936 2.156236e-03 -9.929704e-03
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## 6-299467 -7.132020e-02 -1.618424e-02
## 6-299487 1.714131e-02 -5.896611e-03
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## 6-299936 -2.226714e-04 -1.311723e-03
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## 7-300117 1.133266e-02 -3.199197e-02
## 7-300126 -2.749050e-03 -1.385852e-02
## 7-300172 -1.307088e-02 1.949605e-02
## 7-300199 5.569414e-02 1.234129e-02
## 7-300221 1.182227e-02 -3.114016e-02
## 7-300258 2.829858e-03 3.639807e-03
## 7-300259 -5.036435e-02 -1.196918e-02
## 7-300274 -1.028558e-02 1.351401e-03
## 7-300311 2.262301e-03 -2.357783e-03
## 7-300323 -9.802398e-03 8.452514e-03
## 7-300352 -2.736239e-02 8.479229e-03
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## 7-300379 2.558399e-03 -1.230690e-03
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## 7-300567 -4.216531e-03 7.534051e-05
## 7-300582 1.158572e-02 -1.746134e-02
## 7-300633 -1.554545e-02 -1.098670e-03
## 7-300664 -3.759105e-02 -3.048378e-02
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## 7-300809 -4.830940e-04 -1.101305e-02
## 7-300878 4.928537e-03 -2.436290e-03
## 7-300884 1.050587e-02 -6.727168e-03
## 7-300894 1.208625e-02 3.990661e-03
## 7-300899 6.880489e-03 3.392663e-02
## 7-300900 -5.121458e-03 4.822983e-03
## 7-300936 -1.350209e-02 4.420673e-02
## 7-301167 -2.227142e-02 1.132037e-02
## 7-301167_2 1.343961e-02 4.181160e-02
## 7-301198 7.908962e-03 1.571115e-02
## 7-301212 -1.849249e-04 1.075029e-02
## 7-301269 -1.015234e-02 2.085929e-02
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## 7-301297 1.595414e-03 -4.491346e-03
## 7-301325 2.420566e-04 -1.535144e-02
## 7-301394 -1.124483e-02 8.600906e-03
## 7-301419 8.247755e-04 -1.446656e-02
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## 7-301474 -1.264868e-02 1.930126e-02
## 7-301530 -1.109020e-02 7.300733e-03
## 7-301550 -4.927780e-03 -9.862717e-03
## 7-301585 8.115124e-03 1.316004e-02
## 7-301610 -4.575031e-02 6.098331e-02
## 7-301610_2 -5.902054e-02 -8.159848e-03
## 7-301719 -2.518054e-03 -2.845558e-02
## 7-301787 -2.634728e-02 8.119206e-03
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## 7-301817 9.323032e-03 1.896642e-02

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## 7-301820      1.556316e-02  2.607856e-02
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## 7-302324      8.048295e-03  8.014337e-03
## 7-302327      1.544691e-03  -3.954889e-03
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## 7-302353      1.874620e-03  -5.885489e-03
## 7-302372      -8.991894e-03  -3.506084e-03
## 7-302442      -9.778243e-03  6.764476e-03
## 7-302450      1.971241e-02  -7.416053e-03
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## 7-302492      -9.323031e-03  4.141615e-02
## 7-302501      -1.231724e-02  1.343479e-02
## 7-302533      4.777364e-03  -2.132344e-02
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## 7-302576      1.427534e-02  3.064931e-03
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## 7-302721      -6.350060e-04  -4.995839e-03
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## 7-302760      -2.180436e-02  1.543766e-02
## 7-302785      -3.034516e-02  -3.809058e-02
## 7-302872      -5.651195e-05  -7.642231e-03
## 7-302877      3.519364e-02  1.978777e-02
## 7-302947      -1.262370e-02  1.552624e-03
## 7-302961      -1.262370e-02  1.552624e-03
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## 7-303014      -1.897893e-02  2.038878e-02
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## 7-303050      -4.520604e-05  -2.091231e-03
## 7-303064      2.227270e-02  -6.456838e-03
## 7-303075      -1.270344e-02  3.890158e-02
## 7-303075_2    2.227270e-02  -6.456838e-03
## 7-303122      -5.327537e-03  8.235982e-03
## 7-303141      -5.477107e-03  -1.862514e-02
## 7-303169      3.596557e-02  -1.286300e-02
## 7-303181      4.872751e-03  1.891160e-02
## 7-303195      -5.920725e-03  -1.200234e-02
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## 7-303207      1.595414e-03  -4.491346e-03
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## 7-303345      1.058709e-02 -1.932791e-03
## 7-303351     -5.477107e-03 -1.862514e-02
## 7-303408     -2.684851e-02  8.835967e-03
## 7-303445      3.596557e-02 -1.286300e-02
## 7-303451     -4.160055e-03  8.589430e-03
## 7-303588      9.536611e-02 -4.570134e-02
## 7-303591     -2.224303e-02  1.228157e-02
## 7-303650      2.344614e-02  8.770161e-03
## 7-303669      1.066202e-02 -1.687697e-03
## 7-303700     -2.576524e-02  7.196528e-03
## 7-303700_2    2.788911e-02  1.093362e-02
## 7-303789     -7.234550e-03  1.012299e-02
## 7-303829     -6.611438e-03 -2.394750e-02
## 7-303866      1.537813e-04 -3.792407e-04
## 7-303876     -3.080038e-02  5.772898e-03
## 7-303881     -6.133430e-02 -8.051568e-03
## 7-303892      5.902680e-03  2.865618e-02
## 7-303920      1.066202e-02 -1.687697e-03
## 7-303948     -2.067381e-02 -2.626083e-03
## 7-303958     -3.005085e-02 -2.831319e-02
## 7-303969     -1.166507e-02  1.400811e-02
## 7-304010     -1.384249e-02 -7.547417e-02
## 7-304023     -3.010788e-02 -3.066679e-02
## 7-304086     -2.588931e-02 -3.252213e-02
## 7-304186     -3.025352e-02  6.097540e-03
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## 7-304251      1.945841e-04  1.066375e-02
## 7-304262      1.488413e-02 -1.676609e-03
## 7-304332      1.511786e-03  1.023763e-02
## 7-304348      9.208236e-03 -1.990137e-02
## 7-304371     -7.212169e-03 -1.703487e-02
## 7-304395      1.545815e-02 -1.961576e-03
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## 7-304443     -1.823664e-02  1.646847e-02
## 7-304503      6.027569e-03  2.265954e-02
## 7-304551     -1.248457e-02  1.355549e-02
## 7-304566      2.741180e-03 -4.993725e-03
## 7-304604      1.136504e-02  6.356989e-05
## 7-304611      1.351173e-02  2.976065e-03
## 7-304720      7.366962e-03 -1.143284e-03
## 7-304880     -1.248457e-02  1.355549e-02
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## 7-305008     -2.263050e-02  3.205959e-03
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## 7-305106      8.455573e-03  1.644079e-02
## 7-305110      4.366218e-02 -1.951041e-02
## 7-305134      1.854147e-02  9.901534e-03
## 7-305196      1.427728e-02  2.503998e-02
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## 7-305294     -4.699931e-03 -5.036229e-03

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## 7-305348 7.049203e-03 2.159526e-02
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## 7-305449 1.586338e-02 9.030484e-03
## 7-305516 6.130026e-03 1.827836e-02
## 7-305574 7.016384e-03 1.906429e-04
## 7-305599 -2.100034e-02 -9.360112e-03
## 7-305617 1.586338e-02 9.030484e-03
## 7-305621 7.000402e-03 2.420632e-02
## 7-305637 8.614921e-03 9.792630e-04
## 7-305640 -1.616093e-03 5.217743e-03
## 7-305654 3.548475e-02 -4.399156e-02
## 7-305743 1.243644e-02 1.951581e-02
## 7-305839 2.205568e-02 -2.037347e-03
## 7-305873 -2.397784e-02 9.071540e-03
## 7-305926 3.457098e-02 -3.216944e-02
## 7-305956 3.186995e-03 4.262828e-03
## 7-306033 -1.866556e-02 1.699800e-02
## 7-306058 -6.570276e-04 -1.126926e-03
## 7-306136 2.166137e-02 -1.988000e-03
## 7-306139 2.394943e-04 3.133666e-04
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## 7-306312 -3.636469e-03 9.731779e-02
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## 7-306386 1.156014e-02 -2.464810e-03
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## 7-306514 -7.145506e-03 -3.050287e-02
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## 7-306717 -1.359484e-02 8.251467e-03
## 7-306766 -1.490858e-02 1.404556e-02
## 7-306786 -1.490858e-02 1.404556e-02
## 7-306821 3.334144e-03 1.522062e-02
## 7-306826 -7.548281e-02 -5.810449e-03
## 7-306894 -1.209035e-02 -9.349447e-03
## 7-306921 -2.025803e-02 7.703050e-03
## 7-306959 3.627647e-03 1.605514e-02
## 7-306978 1.906618e-03 -8.227222e-03
## 7-307119 -2.466435e-02 -3.705294e-02
## 7-307146 5.997515e-03 -1.225456e-03
## 7-307172 7.569419e-03 2.259976e-04
## 7-307207 8.879145e-04 -1.375756e-03
## 7-307209 2.185897e-03 -1.464699e-02
## 7-307252 9.876511e-03 -5.122330e-03
## 7-307386 5.623916e-03 9.353645e-03
## 7-307467 6.238785e-03 -9.266924e-04
## 7-307482 -1.244423e-02 2.432998e-03

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## 7-307570      2.757269e-02  3.275830e-03
## 7-307607      1.322674e-02  2.309629e-03
## 7-307651      2.571547e-03  -2.766837e-02
## 7-307739      2.462854e-03  -1.929536e-03
## 7-307746      8.364996e-02  2.843282e-04
## 7-307775      6.868954e-03  4.287875e-04
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## 7-307785     -2.208769e-02  -2.008679e-02
## 7-307826      5.339932e-03  1.496935e-02
## 7-307891     -6.702327e-03  9.619752e-03
## 7-307898     -2.122995e-03  -2.790680e-03
## 7-307908      2.062252e-02  2.531389e-02
## 7-307911     -5.131502e-02  -5.640368e-03
## 7-307981     -4.121946e-02  -3.667900e-02
## 7-307991      1.380323e-02  1.822390e-02
## 7-308103      6.915385e-03  -6.197916e-03
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## 7-308124     -1.381156e-02  -4.087276e-02
## 7-308240      3.902009e-02  5.305025e-02
## 7-308304      1.426729e-02  6.007661e-03
## 7-308314      4.961258e-03  1.471520e-02
## 7-308418      1.806069e-03  -2.080466e-03
## 7-308450      1.032085e-02  2.504916e-02
## 7-308476      2.070560e-02  -3.752841e-02
## 7-308505      1.349799e-02  -5.254499e-03
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## 7-308680     -8.421897e-03  -2.957016e-03
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## 7-308792     -4.149226e-02  2.037785e-02
## 7-308793      1.935485e-02  5.648073e-03
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## 7-308840      1.604758e-03  -3.252828e-03
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## 7-309276     -1.059727e-02  -3.793594e-02
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## 7-309494 -1.688796e-02 5.866555e-02
## 7-309513 -1.016197e-02 9.006924e-03
## 7-309557 1.292485e-03 8.762790e-03
## 7-309564 -5.978062e-03 -2.875963e-03
## 7-309568 1.018231e-02 1.175130e-02
## 7-309606 -1.203438e-02 2.629164e-02
## 7-309610 -2.329998e-02 -2.073370e-02
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## 7-309742 -1.526713e-02 5.260987e-02
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## 7-309872 -2.847193e-02 -2.522342e-03
## 7-309933 -4.096502e-02 2.332488e-03
## 7-309941 -1.203438e-02 2.629164e-02
## 7-310011 -2.506943e-02 -3.515293e-02
## 7-310024 -6.115650e-03 -2.513492e-02
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## 7-310274 -2.127409e-02 -7.328152e-03
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## 7-310940 -2.203801e-02 -1.190602e-02
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## 7-311338 1.726524e-03 -4.391158e-03
## 7-311353 1.759047e-02 2.527179e-03
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## 7-311668     -1.758174e-02 -8.844189e-03
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## 7-312555     -5.108961e-03  2.597393e-02
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## 7-312605      2.103966e-02  9.818691e-03
## 7-312677     -1.980698e-03  2.487061e-02
## 7-312712     -1.094736e-02 -1.984084e-03
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## 7-313180     -2.357561e-02 -1.956086e-02
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## 7-314090 -1.018659e-03 -1.332865e-02
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## 7-314452 -3.254011e-02 -1.076860e-03
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## 7-314841 -1.566276e-02 -6.460604e-02
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## 7-315017 3.747011e-03 -3.217338e-02
## 7-315061 2.422524e-03 -2.119153e-02
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## 7-315344 1.385545e-02 2.747374e-03
## 7-315407 2.671967e-02 1.366176e-02
## 7-315409 -1.894625e-02 6.441500e-02
## 7-315517 1.385545e-02 2.747374e-03
## 7-315573 -7.833317e-02 -2.631076e-02
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## 7-315696 -9.297682e-03 2.916621e-02
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## 7-316071 2.656920e-02 9.931966e-03
## 7-316073 1.326842e-02 2.551262e-03
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## 7-316106 -1.903570e-02 -1.333216e-03
## 7-316125 -2.155743e-03 -8.614274e-03
## 7-316285 -3.731587e-02 -1.040300e-03
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## 7-316417 9.505584e-02 -4.222419e-02
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## 7-316506 -8.514308e-03 2.817311e-02
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## 7-318269 -5.314392e-03 -3.150218e-03
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## 7-318481 1.294733e-02 1.725156e-03
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## 7-325404 4.981510e-03 4.436553e-03
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## 7-328606 -2.569002e-02 -2.612439e-02
## 7-328628 -2.789769e-02 -6.641376e-04
## 7-328638 -2.789769e-02 -6.641376e-04
## 7-328639 -1.390124e-02 5.561872e-03
## 7-328659 -2.368993e-02 9.937958e-03
## 7-328673 2.977536e-03 1.540609e-02
## 7-328674 -7.274989e-05 -8.526180e-03
## 7-328677 -6.393233e-04 -9.313827e-03
## 7-328880 -4.804090e-04 -4.864226e-03
## 7-328904 -6.393233e-04 -9.313827e-03
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## 7-328929 -1.768558e-02 -1.614845e-02
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## 7-328983 9.637201e-03 -7.899511e-03
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## 7-329035_2 1.632471e-03 1.650596e-03
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## 7-329054 -4.156839e-03 -1.450686e-02
## 7-329113 -2.399705e-02 -3.007593e-02
## 7-329150 1.362697e-02 6.737078e-03
## 7-329182 -4.733103e-02 -5.295002e-02
## 7-329188 5.704625e-02 -4.229162e-02
## 7-329203 2.351665e-02 -7.947370e-03
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## 7-329303 -2.536548e-03 1.656200e-02
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## 7-329455 -3.273259e-03 6.188798e-03
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## 7-331232      6.423906e-03  2.020338e-02
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## 7-331438      4.738697e-02  -3.935505e-02
## 7-331454      1.911340e-02  6.726636e-03
## 7-331456      3.678476e-02  -2.113470e-02
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## 7-331967     -6.785697e-03  1.888542e-02
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## 7-332073     -1.298098e-02 -1.312990e-02
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## 7-334040 -1.707043e-03 -8.018904e-04
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## 7-334148 -2.886809e-02 1.617483e-02
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## 7-336395     -3.121944e-02  -2.642542e-02
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## 7-336650      5.012467e-03  -8.137637e-03
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## 7-340587 6.260945e-02 1.459433e-02
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## 7-340722 1.437713e-02 7.133224e-03
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## 7-340865 -9.998770e-03 -1.574585e-03

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## 7-342607 -1.293834e-02 -5.317493e-02
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## 8-355203_2   2.246850e-03 -1.292930e-02
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## 8-355359      -3.549928e-02 -4.403920e-02
## 8-355374      5.922081e-02 -5.012563e-02
## 8-355378      -7.510671e-03  5.162474e-03
## 8-355407      -3.410059e-02 -3.768880e-02
## 8-355408      -5.046741e-02  3.343132e-02
## 8-355434      -1.519998e-02 -1.611280e-02
## 8-355449      -2.304176e-03 -1.493145e-02
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## 8-355629      9.902244e-05 -7.919815e-03
## 8-355722      1.478946e-02  7.120206e-03
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## 8-355874      4.604110e-02 -1.605380e-02
## 8-355884      -9.726259e-03 -3.664506e-03
## 8-355892      2.015866e-02  5.498340e-03
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## 8-358047 -3.052752e-02 -9.925739e-03
## 8-358083 -3.025801e-02 -2.692951e-02
## 8-358085 -2.782318e-03 -4.748744e-03
## 8-358087 -7.680057e-04 -1.249583e-03
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## 8-359594      -2.234488e-03  3.172355e-02
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## 8-359641      -6.761150e-02  -1.267660e-02
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## 8-361437      -2.725777e-02  -3.648656e-03
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## 8-361837      4.726045e-03  1.069711e-02
## 8-362004      -7.891304e-03  9.850066e-03
## 8-362032      -9.252545e-03  -6.560315e-03
## 8-362074      -1.875964e-02  -2.612803e-03
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## 8-362110      -1.935075e-03  -1.432878e-02
## 8-362121      -2.377930e-02  -3.352697e-03
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## 8-365851     -3.816352e-02 -9.535937e-03
## 8-365898      1.974803e-03  2.050206e-03
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## 8-366534      3.898771e-03 -3.913230e-03
## 8-366537      3.241242e-03 -3.696115e-03
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## 8-366716     -2.545529e-02 -1.341565e-02
## 8-366769     -4.766430e-02 -4.686809e-02
## 8-366776      1.765740e-02  1.597371e-02
## 8-366779     -2.550060e-02 -7.233283e-03
## 8-366852      6.175764e-03 -7.999829e-03
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## 8-366949     -4.257374e-02 -7.790006e-03
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## 8-366958      5.457345e-03  1.524325e-02
## 8-366979      4.231547e-03  1.463851e-02
## 8-367091      1.042781e-01  9.507001e-03

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## 8-367491     -8.920579e-03  1.429438e-03
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## 8-367580      9.519628e-02  -3.216322e-02
## 8-367627     -1.701257e-02  2.116982e-02
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## 8-368033      2.871301e-03  -5.663108e-03
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## 8-368078     -3.336761e-03  3.587247e-04
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## 8-368744     -1.028509e-02  -1.555321e-03
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## 8-369130      8.636592e-03  5.489653e-03
## 8-369141     -7.946884e-03  -4.936823e-03
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## 8-369402      7.500743e-03  6.649762e-04

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## 8-369602 -1.370225e-02 1.745297e-02
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## 8-369693 2.861787e-03 5.523232e-03
## 8-369721 -1.686766e-02 2.564902e-02
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## 8-369778 2.173182e-02 5.526875e-03
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## 8-369792 -8.648595e-03 -1.420673e-02
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## 8-369932 -2.358512e-02 2.297355e-02
## 8-370009 -6.247618e-03 -1.206695e-02
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## 8-372396 -1.079951e-02 -3.308610e-02
## 8-372427 -1.408223e-02 -4.096185e-02
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## 8-372512 3.075563e-03 1.112051e-02
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## 8-372588 -1.422700e-01 -1.735573e-02
## 8-372631 1.087919e-02 4.124124e-03
## 8-372639 7.867521e-03 -5.864817e-04
## 8-372699 6.373087e-03 -5.579392e-03
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## 8-373456 -1.086451e-02 2.624451e-02
## 8-373468 -3.201545e-02 -1.224591e-02
## 8-373479 -6.758062e-03 -2.698490e-03
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## 8-374266      -1.401084e-02 -5.292080e-02
## 8-374279      -3.059450e-03 -7.891757e-03
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## 8-374627      1.427494e-02  3.166734e-02
## 8-374668      6.664574e-02 -3.876785e-02
## 8-374747      6.092653e-03  1.862087e-03
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## 8-375101      1.074983e-03  4.598579e-03
## 8-375112      -7.898439e-03 -1.085199e-02
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## 8-375230      4.604110e-02 -1.605380e-02
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## 8-375258      4.778862e-03 -1.392934e-03
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## 8-375286      -3.334837e-02 -5.302414e-02
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## 8-375314      4.808844e-03 -1.708774e-02
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## 8-375622      -1.909126e-02 -1.116038e-02
## 8-375638      -2.278483e-02 -2.158078e-02
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## 8-375705      -3.291954e-02  1.848390e-02
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## 8-376746      -1.698766e-02  2.648819e-02
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## 8-377433      3.484217e-03  9.188451e-03
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## 8-378755      1.779169e-02  6.586605e-03
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## 8-378919      -8.643901e-03  7.531577e-03
## 8-378921      -8.476307e-03  3.002436e-02
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## 8-379020      -8.433481e-03  3.452876e-02
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## 8-379062      5.177128e-03 -1.084237e-02
## 8-379065      -8.494192e-03  5.611563e-02
## 8-379088      5.006025e-03 -1.264742e-02
## 8-379104      -6.434022e-05 -6.066388e-03
## 8-379126      2.206325e-02  3.932914e-02
## 8-379141      -2.451688e-02  1.186879e-02
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## 8-379232      3.807280e-03 -1.775126e-02
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## 8-379695      -1.703681e-03 -7.092049e-03
## 8-379698      2.976705e-02  2.456152e-02
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## 8-379745      2.483707e-02 -6.484043e-04
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## 8-379757      -2.202725e-02 -4.263257e-03
## 8-379781      8.503988e-04 -2.072918e-02
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## 8-379838      -1.041202e-02  8.532882e-03
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## 8-379947      7.474441e-03 -3.872346e-03
## 8-379949      -7.250345e-03 -8.149931e-02
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## 8-380088 -3.303877e-02 -1.206127e-01
## 8-380098 -4.780952e-02 -6.512816e-02
## 8-380152 -3.449317e-02 -2.104703e-02
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## 8-381277 6.296433e-02 -4.915932e-02
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## 8-382158 2.766157e-02 8.957771e-03
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## 8-382775      1.373929e-02  2.402524e-02
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## 8-386964 9.065222e-03 -2.597401e-02
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## 8-392460      3.922868e-02  -1.598940e-02
## 8-392517     -1.210259e-02  3.615561e-02
## 8-392565     -5.579601e-02  -3.076827e-02
## 8-392581      2.500356e-03  -2.434210e-03
## 8-392591     -3.340686e-02  -1.192076e-03
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## 8-392636     -7.973122e-03  -3.035074e-02
## 8-392637     -2.203873e-03  -1.335900e-02
## 8-392649      1.641765e-02  6.938667e-03
## 8-392669      6.546331e-03  3.561542e-02
## 8-392698     -5.040996e-03  9.734291e-03
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## 8-393026      8.478119e-03  4.660406e-03
## 8-393078     -1.411774e-02  1.366078e-02
## 8-393096     -2.492337e-02  -1.307778e-02
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## 8-393120      5.668650e-03  -6.186238e-03
## 8-393167      3.361475e-03  -4.120735e-03
## 8-393252     -4.302388e-03  -2.284402e-02
## 8-393263      4.238726e-02  -1.693118e-02
## 8-393309     -1.665819e-02  -4.514859e-03
## 8-393314      4.283555e-02  -5.305688e-02
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## 8-393340      9.667697e-03  1.989030e-02

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## 8-393513      -2.224885e-02  1.553979e-02
## 8-393528      2.107668e-02  7.611904e-03
## 8-393533      9.622082e-03 -4.237530e-03
## 8-393580      2.586677e-03 -2.350125e-03
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## 8-393651      -2.273682e-02  1.438337e-02
## 8-393678      -9.526237e-03  9.084011e-02
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## 8-393721      7.000580e-02 -1.824411e-02
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## 8-394697      1.761508e-03 -2.305898e-02
## 8-394746      2.561642e-02 -8.365909e-03
## 8-394767      3.014724e-03  5.730895e-03
## 8-394843      -8.863338e-03 -5.167268e-03
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## 8-395130      6.403049e-02 -4.532253e-02
## 8-395225      1.266494e-02  6.393650e-03
## 8-395231      -2.097494e-02  2.401965e-03
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## 8-395506      1.951257e-03  9.242475e-03
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## 8-395729      -2.729048e-02  2.793529e-03
## 8-395836      8.549604e-03  3.187330e-03
## 8-395842      2.079744e-02 -8.905068e-03

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## 8-396234    1.244916e-02  -3.726753e-05
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## 8-396371    2.748913e-03  -3.682688e-03
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## 8-398524 7.408379e-02 -2.807317e-02
## 8-398527 1.088904e-02 2.746544e-02
## 8-398537 1.437521e-02 -1.174873e-02
## 8-398623 1.630977e-02 1.364088e-02
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## 8-398755 1.625642e-02 4.394811e-03
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## 8-398813_2 -5.595512e-04 7.628459e-03
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## 9-400394 -3.418338e-02 -4.918387e-03
## 9-400402 3.324474e-02 -1.188038e-02
## 9-400403 6.806120e-02 -6.208852e-02
## 9-400422 -1.022367e-02 -9.396586e-03

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## 9-400978      -5.310561e-03  7.280579e-03
## 9-400999      -8.994553e-03  1.374348e-03
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## 9-401845      -1.353291e-02 -1.356058e-02
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## 9-402876 -7.354802e-04 3.568976e-03
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## 9-405358      4.744082e-03  -2.156444e-03
## 9-405363     -1.838484e-02  -1.097458e-02
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## 9-405377     -2.319802e-03  1.160689e-02
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## 9-405727     -1.750193e-02  -1.615219e-02
## 9-405739     -2.457891e-02  -5.198245e-06
## 9-405743      2.754222e-02  1.115144e-02
## 9-405760     -2.289412e-02  -2.284102e-02
## 9-405796      3.614001e-02  6.069974e-02
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## 9-405926      8.724033e-04  -1.443785e-02
## 9-405938      4.084832e-03  -4.565536e-03
## 9-405959      1.206891e-02  2.413372e-03
## 9-405977     -2.580638e-02  -2.742817e-02
## 9-405987      1.347288e-02  2.168830e-03
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## 9-406579      4.709131e-02 -1.512524e-02
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## 9-406923      1.125057e-02  1.313511e-02
## 9-406937     -8.836442e-03 -1.019035e-02
## 9-407020     -3.707388e-03 -4.787217e-03
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## 9-407245     -3.262645e-02  1.035271e-02
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## 9-408461      1.223443e-01 -4.361996e-02
## 9-408652     -3.308087e-02 -1.121331e-02
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## 9-411137 5.859287e-04 -1.145331e-03
## 9-411152 -1.594707e-02 3.489191e-03
## 9-411158 1.418881e-03 -1.816965e-02
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## 9-417898      7.367381e-03  -9.371327e-03
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## 9-418064      -3.058542e-02  -1.256427e-03
## 9-418093      3.344258e-02  -6.449505e-03
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## 9-418099      -3.058542e-02  -1.256427e-03
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## 9-418613      -9.904253e-03  5.973976e-03
## 9-418649      3.765999e-03  2.217769e-03
## 9-418655      7.067587e-03  -7.107297e-06
## 9-418662      -4.652204e-02  -3.560752e-02
## 9-418673      1.707348e-02  3.368197e-03
## 9-418715      -2.263793e-02  -3.149707e-03
## 9-418728      -4.024040e-02  -2.647279e-03
## 9-418786      -9.904253e-03  5.973976e-03
## 9-418786_2   -9.904253e-03  5.973976e-03
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## 9-418869      -4.728141e-05  -1.958168e-03
## 9-418926      3.744549e-02  -4.776092e-02
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## 9-419203     -3.547447e-02 -4.283797e-02
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## 9-419523      3.734805e-03  4.746175e-04
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## 9-419631     -2.540800e-02 -1.149972e-02
## 9-419661     -2.468055e-02 -2.583242e-02
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## 9-420112      4.164142e-02 -3.362477e-02
## 9-420142      1.139924e-02  4.382826e-03
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## 9-420524      1.787364e-02  1.100926e-02
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## 9-420740      7.116737e-03 -7.220726e-03
## 9-420752     -2.743942e-02  3.340695e-02
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## 9-421247     -2.791477e-03 -1.594339e-02
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## 9-421357 -1.560696e-02 -5.254457e-03
## 9-421404 -2.550531e-02 -6.613892e-03
## 9-421420 7.244430e-03 6.445817e-03
## 9-421466 6.183697e-04 -4.205191e-03
## 9-421476 9.974416e-03 2.575036e-02
## 9-421491 -2.948501e-02 -2.840385e-02
## 9-421498 -3.433013e-02 9.452835e-02
## 9-421505 5.567185e-04 -1.223657e-03
## 9-421515 -7.635540e-03 -1.596155e-02
## 9-421560 4.332804e-02 -5.840924e-03
## 9-421563 1.326478e-02 -4.638917e-03
## 9-421592 -1.826403e-02 -8.695837e-04
## 9-421600 1.866573e-02 3.919454e-02
## 9-421664 1.080703e-02 2.098711e-02
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## 9-421852 7.312312e-03 6.923335e-03
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## 9-422698 -3.301544e-02 -3.673403e-02
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## 9-422909 2.265706e-02 6.626147e-03
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## 9-423112 5.840203e-04 4.796842e-03
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## 9-424306      -1.363246e-03  -1.864872e-02
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## 9-425437       1.718581e-02   3.133367e-03
## 9-425446      -1.442450e-02   6.762580e-06
## 9-425488       4.164142e-02  -3.362477e-02
## 9-425564       2.841534e-02   1.987783e-02
## 9-425580      -1.575249e-02  -6.519584e-03
## 9-425607       5.099366e-03  -5.216013e-03
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## 9-425840       6.936570e-03   2.098563e-02
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## 9-426470      -2.127254e-02   6.199097e-02
## 9-426579      -1.500049e-02  -2.360289e-03
## 9-426617      -8.841962e-03   2.554422e-02
## 9-426683       3.653179e-02  -1.333150e-02
## 9-426729      -1.275165e-02   1.429489e-03
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## 9-427125      -2.612165e-02  -2.769874e-02
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## 9-427250 -1.125838e-02 -1.055278e-02
## 9-427370 -3.231142e-03 -8.304713e-03
## 9-427443 -2.612696e-02 2.363822e-02
## 9-427576 4.247612e-03 1.082464e-02
## 9-427637 -1.046742e-02 -3.513544e-02
## 9-427666 -2.141839e-02 2.065474e-02
## 9-427701 4.719181e-02 -1.901653e-02
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## 9-427760 -1.219360e-01 -1.251162e-01
## 9-427864 8.913003e-02 -2.851750e-04
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## 9-429887 -2.513340e-04 6.884403e-03
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## 10-478893 1.047544e-02 2.247324e-03
## 10-478950 3.726183e-03 1.535677e-02
## 10-478961 7.930588e-02 3.739760e-03
## 10-479049 3.619098e-02 -2.965254e-03
## 10-479069 -1.030709e-02 1.750082e-02

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## 10-485575    -1.498230e-02  -6.407048e-02
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## 10-492561_2 9.743790e-02 -6.351778e-02
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## 10-492604    1.680427e-02  5.073727e-03
## 10-492645    5.882973e-03 -4.477001e-03
## 10-492864    -7.870672e-03 -1.249253e-02
## 10-492882    1.816590e-02  4.403806e-02
## 10-492895    -1.323954e-02 -1.250193e-03
## 10-492935    9.214183e-04  1.154238e-02
## 10-492979    1.127849e-01  -2.532425e-02
## 10-493001    -2.667963e-02  -3.049335e-02
## 10-493009    1.252382e-02  2.802591e-02
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## 10-493018    -4.907200e-03  9.264457e-03
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## 10-493088    -4.015818e-02  -5.557807e-03
## 10-493093    -2.135782e-02  -1.429121e-03
## 10-493206    -8.580595e-03  1.223961e-02
## 10-493271    -2.679371e-02  -1.197085e-02
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## 10-493308    9.864752e-03  -9.309002e-03
## 10-493315    7.583127e-03  5.406203e-02
## 10-493336    -8.249578e-03  -7.452608e-03
## 10-493347    -2.311591e-02  -2.578997e-02
## 10-493395    8.425768e-02  1.003536e-03
## 10-493396    -4.017629e-02  -6.030723e-03
## 10-493424    1.892450e-02  9.622252e-04
## 10-493473    1.269766e-02  3.215112e-03
## 10-493515    -2.000375e-02  -1.749515e-02
## 10-493539    1.313420e-02  3.307948e-03
## 10-493547    6.700054e-04  1.055588e-02
## 10-493587    -2.203876e-02  -5.672851e-03
## 10-493592    2.808917e-03  1.996075e-02
## 10-493630    8.425768e-02  1.003536e-03
## 10-493701    -1.885426e-02  -3.330705e-03
## 10-493713    6.015268e-03  1.969410e-02
## 10-493749    -2.755214e-02  -7.491752e-03
## 10-493750    -2.580825e-03  -2.093293e-02
## 10-493771    -6.949246e-03  -1.449434e-02
## 10-493780    -1.336646e-04  -2.361974e-02
## 10-493785    6.081871e-03  1.243349e-02
## 10-493830    -3.820756e-02  -6.704387e-03
## 10-493848    -1.102741e-02  3.709665e-03
## 10-493883    -2.214780e-02  -3.223591e-03
## 10-493889    1.891122e-02  1.054641e-03
## 10-493909    -1.015699e-02  -3.652789e-02
## 10-493938    2.904999e-02  9.744747e-03
## 10-493955    7.688918e-03  -1.416835e-02
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## 10-494051    1.757061e-02  6.916840e-03
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## 10-494125    -3.163534e-03  -8.441331e-03

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## 10-494300 2.065956e-03 5.970763e-02
## 10-494316 -6.956887e-02 2.232110e-02
## 10-494321 2.250100e-03 -1.832165e-02
## 10-494339 -2.639994e-03 -1.658653e-02
## 10-494354 -1.830449e-02 -3.950553e-03
## 10-494363 -2.681926e-03 -1.666510e-02
## 10-494416 2.682151e-02 8.292609e-03
## 10-494419 -1.809874e-02 -5.141616e-03
## 10-494436 -1.989694e-02 2.013731e-03
## 10-494466 1.875341e-03 5.438710e-02
## 10-494468 2.682151e-02 8.292609e-03
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## 10-494520 -1.761441e-02 -8.102176e-03
## 10-494526 2.081069e-02 6.542955e-03
## 10-494540 -1.751589e-02 -4.210214e-02
## 10-494571 -3.876333e-02 1.776227e-02
## 10-494581 -5.194085e-03 -1.173536e-02
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## 10-494792 3.806113e-02 1.240977e-02
## 10-494809 1.218319e-02 1.053153e-03
## 10-494830 2.482067e-03 -1.940212e-02
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## 10-495445 -3.167303e-02 1.294182e-03
## 10-495447 3.240314e-03 5.323148e-03
## 10-495459 -1.652731e-02 8.621513e-03
## 10-495492 -3.137356e-03 -6.033031e-03
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## 10-495879 -2.565345e-04 9.292880e-03
## 10-495889 4.669189e-03 1.252566e-02

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## 10-496289  1.104396e-02  2.288966e-04
## 10-496321  -3.540652e-02 -5.868194e-03
## 10-496322  1.164022e-02 -3.365926e-02
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## 10-496413  -1.322811e-02 -1.054030e-02
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## 10-496444  -5.146498e-04 -7.141620e-03
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## 10-496505  -1.340203e-02  5.376660e-04
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## 10-497439  -1.778428e-02 -9.871783e-03
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## 10-497820  1.816805e-02  3.913283e-03

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## 10-498039 -3.200847e-03 -9.178835e-03
## 10-498072 -1.509397e-02 3.264803e-02
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## 10-498298 -1.887169e-02 2.089760e-02
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## 10-498332 -7.467931e-03 1.090253e-02
## 10-498449 -1.652001e-02 -1.496628e-03
## 10-498459 -1.462772e-02 -2.875361e-02
## 10-498462 2.417879e-02 7.206625e-03
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## 10-498582 -1.477214e-02 -2.936217e-03
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## 10-498797 2.017675e-02 3.916173e-04
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## 10-498904 1.011242e-02 2.169040e-02
## 10-498923 5.961635e-02 -6.456348e-02
## 10-498935 8.425768e-02 1.003536e-03
## 10-498956 -1.386377e-02 2.661937e-02
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## 10-499479 8.092473e-03 8.002291e-03
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## 11-500132  1.069372e-02  3.755523e-03
## 11-500149  1.191421e-02  -6.639264e-03
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## 11-501209  7.753618e-03  4.146631e-02
## 11-501311  1.562139e-02  9.036569e-03
## 11-501331  -4.057190e-02  -2.137164e-02
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## 11-501677  -1.779904e-02  4.703841e-02
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## 11-501927  2.384934e-02  6.375545e-03

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## 11-502984 1.427773e-02 5.281668e-03
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## 11-503160 1.432013e-03 3.578564e-03
## 11-503164 1.485240e-02 5.001768e-03
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## 11-503308 -2.865974e-03 1.047317e-02
## 11-503326 -2.731390e-02 -6.699517e-03
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## 11-503388 3.497162e-02 -5.325071e-02
## 11-503452 -2.731390e-02 -6.699517e-03
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## 11-503803 -1.934067e-02 6.533664e-02
## 11-503880 3.304669e-02 -3.974237e-02
## 11-503911 4.260183e-03 7.190395e-03
## 11-503938 3.001563e-03 1.257493e-02
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## 11-504008 -3.616294e-02 -9.568340e-03

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## 11-542895 1.739469e-02 9.037818e-03
## 11-542908 -1.029377e-02 3.046163e-02
## 11-542909 -1.127358e-02 1.161722e-03
## 11-542925 -1.545853e-02 2.959298e-03
## 11-542926 1.033690e-02 2.256994e-02
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## 11-543132 -7.105785e-04 -1.242897e-02
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## 12-555426 1.609557e-03 -1.982400e-02
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## 12-555498 2.040254e-02 7.945502e-03
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## 12-555627 7.560480e-03 1.889430e-02
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## 12-582794 -2.345773e-02 -1.204780e-03
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## 12-586456 -3.196625e-02 -1.306517e-02
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## 13-629563 -2.207363e-02 -5.752747e-03
## 13-629657 -3.001391e-04 -1.226277e-02
## 13-629691 1.563194e-05 -5.033914e-03
## 13-629694 -1.106436e-03 7.409579e-03
## 13-629793 -1.219474e-02 -4.575822e-02
## 13-629796 -8.465660e-03 4.616799e-03
## 13-629863 4.574283e-02 -1.644371e-02
## 13-629874 -1.072040e-02 2.819305e-03
## 13-629875 -4.644283e-02 1.226701e-03
## 13-629931 1.698485e-02 3.620730e-02
## 13-629990 8.117174e-04 -2.642454e-02
## 13-630007 -1.089611e-04 -1.479555e-02
## 13-630008 9.934180e-03 -1.850064e-03
## 13-630016 -2.924266e-03 -9.839870e-02
## 13-630023 -2.114605e-02 -1.144829e-02
## 13-630068 5.955439e-03 -6.043298e-03
## 13-630076 -1.244794e-02 -1.034309e-01
## 13-630109 5.955439e-03 -6.043298e-03
## 13-630161 -1.577528e-02 -9.372106e-03
## 13-630234 -1.151417e-02 -4.889833e-03
## 13-630254 -1.300910e-02 5.982553e-04
## 13-630268 8.272897e-04 -5.135939e-03
## 13-630289 -2.810117e-03 -1.216924e-02
## 13-630311 -9.033691e-03 1.266935e-02
## 13-630323 1.153242e-02 -2.546278e-04
## 13-630354 1.435702e-02 -9.819163e-04

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## 13-630355  1.062118e-02  9.292498e-03
## 13-630407  2.022715e-02  7.378805e-03
## 13-630463  -6.748716e-03  1.085764e-02
## 13-630493  4.574283e-02  -1.644371e-02
## 13-630501  -2.124407e-02  1.400039e-02
## 13-630505  -4.735228e-03  -2.542719e-02
## 13-630526  1.086689e-03  3.068467e-02
## 13-630540  -1.285065e-02  -5.078034e-04
## 13-630544  -1.701552e-02  1.336101e-03
## 13-630589  5.488878e-03  6.716511e-04
## 13-630685  -4.177177e-03  -1.852783e-02
## 13-630707  4.574283e-02  -1.644371e-02
## 13-630730  1.728875e-04  9.464357e-03
## 13-630780  -4.208698e-03  -3.607551e-02
## 13-630806  1.300001e-02  3.088001e-03
## 13-630807  -1.264278e-02  -8.396735e-04
## 13-630811  1.312741e-03  -5.392680e-03
## 13-630830  -7.183670e-02  -1.607354e-02
## 13-630893  2.684739e-02  1.783279e-02
## 13-630907  1.098711e-03  -4.570138e-03
## 13-630932  5.113140e-02  -2.361491e-02
## 13-630941  -3.911925e-03  -7.476414e-03
## 13-631042  4.373750e-03  -2.864508e-03
## 13-631042_2 -2.663655e-02  -3.895899e-02
## 13-631045  -2.121955e-02  -9.671900e-03
## 13-631048  4.574283e-02  -1.644371e-02
## 13-631106  2.532712e-03  -4.431626e-03
## 13-631130  4.574283e-02  -1.644371e-02
## 13-631158  1.446102e-02  6.893828e-03
## 13-631223  -7.318033e-02  -1.735407e-02
## 13-631251  -2.357053e-02  2.467286e-02
## 13-631259  1.380820e-02  1.907234e-02
## 13-631263  3.274753e-02  -2.548512e-02
## 13-631289  6.106821e-03  -7.072700e-03
## 13-631343  1.361531e-02  -2.655180e-04
## 13-631370  -3.314391e-02  -6.676571e-03
## 13-631395  1.927206e-02  2.244551e-03
## 13-631406  1.258169e-02  7.042575e-03
## 13-631429  -2.988728e-03  4.743662e-05
## 13-631454  1.920223e-03  1.233859e-02
## 13-631512  -5.292754e-03  -4.993074e-03
## 13-631662  8.735672e-04  4.082682e-02
## 13-631782  -2.374358e-02  3.666583e-02
## 13-631838  4.300505e-02  -2.060246e-02
## 13-631863  -4.926450e-04  -1.285796e-02
## 13-631888  6.350730e-02  4.979747e-02
## 13-631934  -4.813578e-03  -1.172962e-02
## 13-632023  8.360376e-03  6.606000e-03
## 13-632031  5.433803e-02  -4.955526e-02
## 13-632054  1.447821e-03  -4.032315e-03
## 13-632060  9.624639e-04  8.280124e-03
## 13-632125  1.198794e-02  -8.031622e-04
## 13-632158  1.126581e-02  4.546964e-03
## 13-632174  -7.148979e-03  8.295235e-03

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## 13-632190 -2.670539e-02 -9.923783e-03
## 13-632216 4.574283e-02 -1.644371e-02
## 13-632273 -2.670413e-02 -6.957125e-04
## 13-632285 1.129250e-02 5.211450e-03
## 13-632326 5.074086e-02 -4.553807e-02
## 13-632356 1.923963e-02 6.878901e-03
## 13-632373 -2.594062e-03 -1.520257e-02
## 13-632383 6.598090e-03 -1.680005e-02
## 13-632613 4.649218e-02 -4.981296e-02
## 13-632627 4.739719e-02 -3.108684e-02
## 13-632634 -1.630941e-02 6.635538e-02
## 13-632746 -1.106798e-02 1.889749e-03
## 13-632785 3.276822e-02 1.918939e-02
## 13-632785_2 3.213946e-02 -1.677768e-02
## 13-632799 3.459784e-03 -6.971016e-04
## 13-632803 4.574283e-02 -1.644371e-02
## 13-632820 1.090455e-02 5.319850e-03
## 13-632850 -1.086464e-02 4.501032e-02
## 13-632859 -1.490416e-03 7.763342e-03
## 13-632877 -1.041388e-02 -4.122598e-02
## 13-632889 1.173994e-02 6.130747e-03
## 13-632962 1.842491e-02 1.617312e-02
## 13-632986 -4.781284e-03 1.918782e-03
## 13-633062 1.009131e-02 2.047616e-03
## 13-633075 3.288812e-02 -2.876261e-02
## 13-633146 1.266291e-02 2.938524e-02
## 13-633161 2.193516e-02 8.095128e-03
## 13-633198 3.627338e-03 2.618718e-03
## 13-633222 7.013050e-03 -2.126943e-03
## 13-633374 1.062834e-02 6.112975e-03
## 13-633382 4.104590e-02 5.207699e-02
## 13-633411 1.258446e-02 -5.932632e-04
## 13-633421 2.691649e-02 -4.567387e-02
## 13-633439 -8.331440e-02 3.517743e-04
## 13-633479 -3.098347e-02 -3.823395e-02
## 13-633544 -2.247372e-02 2.862015e-02
## 13-633592 2.031321e-03 -2.162994e-03
## 13-633648 1.980444e-02 6.677524e-03
## 13-633666 2.358355e-03 -2.949179e-03
## 13-633711 3.776483e-03 7.938407e-03
## 13-633771 2.647952e-02 -6.456904e-03
## 13-633812 -1.446584e-02 -4.426316e-02
## 13-633897 -1.001609e-02 -7.041911e-03
## 13-633908 -3.996112e-02 -1.051658e-02
## 13-633932 -1.771507e-03 1.847398e-03
## 13-633979 -1.490859e-02 1.539784e-02
## 13-634000 -3.887640e-02 -1.209569e-02
## 13-634061 -2.755480e-03 -1.497074e-02
## 13-634068 -1.233950e-03 2.935341e-03
## 13-634165 -5.462657e-03 -1.904400e-03
## 13-634177 2.358355e-03 -2.949179e-03
## 13-634191 1.211109e-02 -7.613227e-04
## 13-634258 -2.729113e-03 -3.995089e-03
## 13-634259 2.315530e-02 -2.749398e-02

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## 13-634264    7.058425e-03 -1.206112e-02
## 13-634326    1.018326e-02  7.256582e-03
## 13-634427    2.022869e-04  6.065458e-02
## 13-634438    -3.904027e-03 5.961405e-03
## 13-634450    1.882773e-02  3.463647e-02
## 13-634606    -6.121552e-02 -5.493910e-02
## 13-634631    1.236472e-02  4.158537e-03
## 13-634658    1.070367e-02  7.059561e-03
## 13-634769    -3.029298e-02 -3.700935e-02
## 13-634819    -1.978401e-02  2.597726e-02
## 13-634923    -2.727294e-02 -1.240790e-02
## 13-634954    5.834178e-03  1.508514e-02
## 13-635021    8.556495e-03  -2.255419e-02
## 13-635078    -2.370630e-02 -5.090902e-03
## 13-635142    -3.314070e-02 -3.997833e-02
## 13-635185    -8.421753e-03 -9.680403e-03
## 13-635188    2.358355e-03  -2.949179e-03
## 13-635216    5.803315e-03  2.552103e-03
## 13-635261    1.004087e-02  2.548277e-02
## 13-635313    1.916580e-03  -1.483531e-02
## 13-635324    -5.654088e-05  8.771786e-03
## 13-635376    4.075815e-03  -1.521212e-02
## 13-635411    -9.260916e-03 -5.502412e-03
## 13-635419    -4.457961e-04  3.250214e-03
## [ reached getOption("max.print") -- omitted 9705 rows ]
##
## $sites
##          RDA1        RDA2        RDA3        RDA4        RDA5
## 34   -0.8643058101 -0.916613040 -0.6236796023  0.428157362 -1.973140139
## 35   -1.1049385533  2.169443588  1.4839046750  0.386991699  1.178208878
## 45    1.8956905553  0.279013669  0.3473426458 -3.350123408  1.738145404
## 46    0.0926183526 -1.908499687 -0.2064069835  0.010687883  0.402323045
## 47   -0.4219394159 -3.165675106  0.1950281794  2.892616423  3.469822051
## 65   -0.4897279971 -2.674304799 -0.4102363620  1.531973851  0.442008667
## 66   -0.0133615916 -1.320640848  1.9251736845 -1.521890966 -1.742268735
## 73    0.1861580594 -1.174328069  0.7788243903 -1.450925372 -0.609019138
## 86    0.9346324809 -1.202897165  0.2663101598 -2.102042525  0.653039228
## 107   -1.3947326501  2.104726228  0.4925586606  0.755148570 -0.239641371
## 120    3.0830513891  0.229857897 -0.4860463273  2.623740300 -2.193094741
## 128    1.5631136464  0.446653987  0.2324339705 -1.820481423  1.577287568
## 133   -0.1449543655 -2.233478843 -0.0762783680  0.832828110  0.835857823
## 165   -0.6105727515 -2.158876735 -1.3520231711  0.995173337 -0.517218580
## 174   -0.5120319860 -1.266462305  1.2366055162  0.729638783  3.672981589
## 176    1.1655283955 -1.141007315  0.3383112783 -3.827887168 -0.367079678
## 195    1.3779394830 -0.924830033  0.4189674478 -3.908929798 -0.203781675
## 199   -0.5754163038  0.504806937  1.4778651452  0.349286766 -0.020122713
## 208   -0.5239183252 -1.340639092  0.5294222413 -0.056574261 -2.288675827
## 216   -1.0705735443  1.362987755 -2.3459343744 -0.073204208  0.588825064
## 217   -0.4219785477 -2.638105994 -0.3100722393  1.509493671  0.461582257
## 222   -0.6434431333 -0.396519784  1.5307912216  0.178178695 -1.356983838
## 225    0.9833026810 -1.149829274  0.4234119752 -3.232127381 -0.326769484
## 231   -0.3706442279 -2.587836777 -0.2348343097  1.437377932  0.537781048
## 237   -0.4874194155 -1.274572430  1.2675347546  0.935834501  4.484445503
## 255    1.8196576012  0.255357025  0.3072726374 -3.095853282  1.837121877

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```

## 256 -1.1572017578 1.223566427 -2.3918363173 -0.059538097 0.308695755
## 262 -1.2839896816 1.747316706 0.9978651497 1.023274163 -0.118285923
## 269 1.0283174543 -1.206357989 0.1682927097 -2.378273175 0.441584519
## 270 -1.0368354467 0.314146990 -2.4986028524 -0.209398655 0.166999712
## 272 -0.4387149128 -3.213707025 0.1589120921 2.853114051 3.201764686
## 281 1.4199860075 0.684197825 -0.1398643210 -0.329484992 0.924087259
## 294 -1.2552049394 2.400765639 1.5020543430 0.223604153 0.707341300
## 307 -0.0262690155 -1.387740659 1.5565897293 -2.198053456 -1.568891405
## 310 2.1360421061 0.276391894 0.1033605126 -1.209136191 1.357963527
## 315 2.0162874829 0.253743226 0.0865173391 -1.502834326 1.360563277
## 339 -1.1768545427 0.926655130 -0.1766424926 0.786669147 -0.842008973
## 349 -1.1477554976 2.186623536 -1.0471203765 0.123170779 0.406484640
## 353 -0.9141569949 1.745234789 1.6365781773 0.570691069 1.171719070
## 360 -1.3308399606 1.892163026 0.4535183909 0.807824860 -0.387883520
## 383 -0.5475515694 0.947373231 1.2042719484 0.133199039 0.668427965
## 386 2.7151360077 0.150698958 -0.1682561163 0.823427830 0.478591303
## 387 1.8403001974 -0.870217135 0.2175795489 -3.370560989 0.357090741
## 398 -0.9975466642 1.205834868 -2.3084572889 -0.107456020 0.772950843
## 405 1.9013958962 -0.827152515 0.1513381713 -3.163308332 0.447619766
## 406 -0.6424356341 -1.066286340 1.3535525577 0.207429532 -2.331366883
## 413 -0.9707851791 -1.149739214 -0.5520731706 0.691408539 -2.368073293
## 424 -0.7800941402 -1.242256342 0.4052133512 0.623904074 -2.749128466
## 438 -0.7027713702 -1.316346297 1.0013392261 0.405971795 -2.956692926
## 439 -1.2120953418 1.214819092 0.4273004357 1.156142906 -0.850325039
## 450 -0.2573236521 -1.636096868 1.7120261665 -1.076577923 -1.614545113
## 451 -1.3734850313 2.003055615 0.5370610683 0.778566336 -0.265186534
## 453 0.4585367173 -0.536236811 1.2818262364 -1.304631881 -0.476659466
## 466 -1.2794238038 1.604228024 0.5909652109 1.083307184 -0.596133804
## 470 -1.2725271871 2.052532923 -1.9887333472 -0.025338380 0.429042637
## 480 -1.1943749567 0.941875083 -0.1601147540 0.805914714 -0.900560471
## 481 -0.0858831358 -0.390772720 1.2764613567 -0.748513888 -0.734032066
## 482 -1.1324199925 2.193486060 -1.1471855827 0.215407820 0.437269175
## 488 1.4801794626 -0.981756124 0.1089838119 -2.822967633 0.105770277
## 503 -1.2202453661 0.853148679 0.9354684524 1.385004221 -1.166382694
## 506 -0.1405747921 -1.747134234 1.7212096211 -1.618533003 -2.345305060
## 519 -1.1382443373 0.367876775 1.0539341175 1.265701170 -1.475963662
## 520 2.7549160327 0.330851266 -0.3648355714 2.222537083 0.028187525
## 521 0.9361500436 0.659924238 0.4979449703 -1.819422088 1.565995632
## 526 0.2191771515 1.289900723 0.3066555883 -1.328154091 1.543090664
## 531 -1.3909008505 2.374656087 -0.0226254759 0.445964094 -0.074438985
## 532 -1.4408516050 2.762741336 0.6909779508 0.800193379 0.521468334
## 538 -1.3166605994 1.592383022 -2.1580140959 0.080861956 0.015487474
## 555 -1.0475484465 -0.198095780 -0.0295928282 0.775212026 -2.001741826
## 570 -0.6866219352 1.717631581 1.3426661146 0.218262978 1.414990091
## 573 -0.4280136780 -1.599635241 1.7221485955 -0.520046385 -3.052995426
## 574 -0.5113175161 -2.335659440 -0.6849265985 1.363930073 0.505981780
## 583 2.8755997694 0.369397397 -0.4169993195 2.762805748 -0.354982754
## 608 -1.1706051577 -0.466131802 -3.4013895413 -0.346533871 -0.365319180
## 630 -1.3883456385 2.395545845 -0.5740558950 0.199019839 -0.076538508
## 642 -0.4216368168 -1.123040365 1.4597642219 -0.198368617 -2.292672848
## 645 -0.6669137263 -1.260600555 -0.4260902723 0.075585775 -1.872224941
## 650 -1.1857534744 1.121085659 0.9634306252 1.127811810 -0.600693600
## 653 -0.5868583263 -1.465568191 1.4280585995 0.905976967 2.743277762
## 666 1.2813364980 -1.090595966 0.2894900967 -3.509668826 -0.195471745

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## 671  2.2695921096 -0.296240914  0.0273126323 -1.076989368  0.499469981
## 672 -1.2576506545  2.220652716 -1.3536895591  0.076479371  0.288568342
## 679 -0.7157719321 -0.339822618  1.6527656868  0.263257275 -1.688295146
## 682 -1.2301153497  2.445049084  1.1366956207  0.262292190  0.700887678
## 689 -1.1502773076  2.142616678  1.4898734231  0.512088266  1.063335184
## 693 -0.2489808401 -2.401059081 -0.1374302838  1.069337833  0.760710380
## 696 -0.4847447340 -2.336469670 -0.7797580931  0.992345939 -0.005503454
## 706 -1.0433110722  2.147566863  1.2664227562  0.138363448  0.996566879
## 726  2.0061880765 -0.570672638  0.0177167490 -1.413005422  0.247448347
## 734  0.1814087168 -1.288689496  1.2023275987 -1.977588884 -1.588331147
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## 781  2.9850785528  0.099306060 -0.4017493095  2.163735754 -1.673574381
## 798 -1.2048814586  2.266237084  1.3925279346  0.282414439  0.825311219
## 809  2.8526928589  0.243390034 -0.3162130957  2.267182281 -0.050578361
## 816 -1.0999035170  1.612656379 -2.2185316762 -0.061892593  0.763966034
## 817 -1.1968057517 -0.367739071 -3.4078393206 -0.289050265 -0.305357903
## 846 -1.3635938139  2.248673252  0.7787714158  0.556354852  0.018734007
## 856 -0.0873216736 -2.166828341 -0.0069311932  0.628156636  0.762605567
## 858 -0.4785631878 -3.072829351  0.1645018486  2.805814420  3.318392234
## 862  0.3353128667 -1.237289084  1.2153022013 -2.052056889 -1.554314792
## 875 -1.2531186414  2.413266330  1.5207062633  0.266622493  0.791123807
## 886 -0.1644023098 -1.371401795  1.7489210961 -1.097148000 -2.185623180
## 887 -0.2099000644 -1.3319111832  1.7320672366 -1.027724853 -2.177650826
## 892 -0.4413961783 -3.379074332  0.2541333413  3.166697180  3.713360791
## 898 -0.6121332806 -2.283156857 -1.0310298189  1.229016575 -0.232220927
## 902 -1.4504998901  2.706068465  0.8296937524  0.455743140  0.154427685
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## 1101 0.2374156282 -1.380671768  0.3032578156 -0.752431114  2.704882093
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## 1116 0.2124709145  1.202943268  0.2612269728 -1.229892570  1.618237175
## 1117 -0.3745413426 -3.117924657  0.1980023377  2.708024612  3.225230205
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## 1146 2.8213932018  0.234855826 -0.3070604696  2.192476715  0.042599982
## 1150 0.0438403160 -1.355154353  1.5303245291 -2.235688246 -1.498026307
## 1155 -0.1376475651 -0.955974165  1.7690258599 -1.202819140 -1.475161400

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## 1157 2.7550637475 0.109963349 -0.1791602817 0.931406252 0.602574811
## 1159 -1.2101382119 1.965658265 -1.8743640656 0.007023899 0.493996859
## 1162 2.9575418377 0.143120470 -0.4067183279 2.267481871 -1.787706878
## 1166 3.0916981354 0.314337250 -0.4760863973 2.856981258 -2.003055796
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## 1190 0.3634144524 -0.700863906 1.3576233232 -1.386257470 -0.677619339
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## 1204 2.6782081426 -0.021149230 -0.1243827063 0.453047025 0.335854845
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## 1460 -1.4454533134 2.676984317 0.8080195423 0.861771035 0.520271145
## 1473 -0.1811577356 -1.649332815 1.8158501333 -1.696262707 -2.266788593

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## 1569 1.8595692012 -0.682864054 0.0474065935 -1.968493249 0.305749913
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## 1790 -1.0506340739 0.307602762 0.0223364483 0.925924500 -1.543447644
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## 1826 -1.2926289386 1.030621056 0.6512279455 1.351177286 -1.003949885
## 1830 -0.8537248498 0.948039071 -2.0784778958 -0.020150865 0.564057325
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## 1854 -1.2803829561 1.605158829 0.5938865096 1.088910116 -0.605960560
## 1859 -0.4350069248 -3.253019948 0.2218232363 2.946024668 3.436025207
## 1866 -1.1242538904 0.348072362 0.8929678336 1.260408389 -1.507225583
## 1869 -0.4466930073 -2.934808658 0.0674495018 2.576569459 2.919214534
## 1874 -0.8263369473 -0.177062628 1.4465543068 0.472471603 -1.418726640
## 1886 -0.9623909064 0.715618893 -2.0531780815 -0.216438588 0.453857882
## 1905 -1.1811402553 2.254982701 1.4328558166 0.253577453 0.907594256
## 1906 1.8847786563 -0.867349099 0.1994270523 -2.922666411 0.459066676
## 1910 -0.3535510609 -1.771575253 1.6827870861 -0.589509101 -1.697508737
## 1932 2.4587154509 0.208301883 -0.1006206233 0.699029392 0.767707638
## 1933 -0.8348657368 -0.746935893 0.5695650944 0.638668867 -2.318028282
## 1934 -1.0117290557 0.939967125 -2.1757508899 -0.135472247 0.378235383
## 1937 -1.1288404278 2.339326389 1.3294189566 0.105823343 0.761504737
## 1940 -0.5638285999 -1.377694885 1.1686932425 0.754371881 1.518618180
## 1954 -1.4702029800 2.751056215 0.7926452817 0.445106917 0.071616463
## 1963 2.9639463350 0.161259345 -0.3905121906 2.224320222 -1.617953272
## 1965 -0.8798761653 1.345543986 1.4259379357 0.513555474 0.567369806
## 1966 -1.2371022221 -0.233697108 -3.4657019411 -0.352363575 -0.420564659
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## 1974 3.0717476490 0.247699541 -0.4565620171 2.816023144 -1.891928209
## 1983 1.8041305386 -0.660442204 -0.0530651659 -1.926193938 0.151568756

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## 2011 1.8234143736 0.319980990 0.1453374994 -1.774085886 1.376067390
## 2026 1.3284495540 0.647052596 0.0289810157 -0.526689136 0.964561253
## 2032 0.3280268076 -1.282655768 0.2782579240 -0.960926706 2.534618964
## 2054 -1.0671516569 1.114076053 1.0769568102 0.973877695 -0.337416964
## 2064 3.0511448321 0.206994294 -0.4482888984 2.494971225 -2.056344821
## 2073 -0.7121650748 -1.459475572 1.0347177535 0.063668232 -2.911173666
## 2078 2.8801371204 0.098434760 -0.4093224104 2.022674050 -1.666019025
## 2080 0.4227036399 -1.232931825 0.3037913275 -1.204729726 2.403763295
## 2091 -1.1550711690 1.495363486 0.8402485958 0.992839011 -0.183171157
## 2102 -0.4276527014 -3.152169434 0.2187672485 2.775394025 3.431296538
## 2105 -1.2845707153 1.586540415 -1.9709136582 0.114075912 -0.172460340
## 2120 -0.3757592934 -1.601083965 1.4421506876 -0.414030131 -1.613805513
## 2125 -1.1888563237 2.494522543 1.2044010036 0.236663519 0.742023935
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## 2179 1.5751162397 -0.942607069 0.2674259634 -3.798951894 0.128792404
## 2180 1.5945674782 -0.928724934 0.2371146225 -3.820371342 0.163695191
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## 2222 -0.8206590619 -1.545004943 -2.5844008597 -0.618446118 -0.947847928
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## 2268 1.2910761450 -1.094686765 0.3543578400 -4.305408391 -0.345711361
## 2269 -0.6762618085 -1.523494803 0.9152514917 0.201346379 -3.037181244
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## 2284 0.2567110326 -0.184904554 1.2442277567 -0.912531050 -0.316190182
## 2292 -1.1826037415 0.930774876 -0.1761128153 0.798999006 -0.844131948
## 2295 -1.2624033390 1.374032013 0.7756561389 1.272655450 -0.640895033
## 2296 -1.4654659892 2.773516060 0.8123982358 0.488760335 0.169899071
## 2298 1.8683128060 -0.917558789 0.1544624449 -3.403449871 0.486552308
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## 2439 -1.4227396173 2.535799582 0.5439998615 0.430039441 0.032427051
## 2451 -1.2301125762 1.203834037 0.2805014808 0.947779512 -0.824574954
## 2452 -0.5022941181 -1.336799957 0.9035546463 -0.123581969 -1.851015916
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## 2462 -1.3996344540 2.244040399 0.3150054815 0.631586317 -0.176605295
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## 2591 -0.5387754747 -1.368885944 0.5572342670 -0.152257353 -2.308250694
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## 2634 -0.6113730245 -1.487631097 0.6999801501 0.194084781 -2.599126473
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## 4521  0.403429078
## 4532  0.660342876
## 4534 -0.016904893
## 4538 -0.017820161
## 4554  0.710399089
## 4561  0.250189758
## 4573 -0.273468472
## 4580  1.352300245
## 4581  1.348581096
## 4584 -0.333635656
## 4587  0.881128148
```

```

## 4602 3.443922993
## 4608 2.106002260
## 4609 1.111924582
## 4617 -1.797361266
## 4624 0.403990471
## 4628 -0.781495372
## 4666 0.222835057
## 4670 -0.035706805
## 4682 3.357139053
## 4699 -0.664399964
## 4703 1.195257246
## 4719 -2.669284811
## 4728 -2.388306434
## 4729 1.551682503
## 4740 0.226267124
## 4752 3.333214176
## 4755 -0.113487203
## 4768 -0.723398426
## 4777 0.167963899
## 4800 -0.354498598
## 4806 0.361333715
## 4816 -1.649328031
## 4824 1.659162957
## 4839 0.955997015
## 4849 -0.404640444
## 4870 1.361652909
## 4895 0.554973813
## 4924 -3.652337877
## 4945 -1.992087586
## 4947 1.263773852
## 4948 4.151626191
## 4953 -1.751106865
## 4962 -2.010314611
## 4969 -1.485118761
## 4974 1.268811155
## 4990 0.678428316
## 4998 2.585102013
## 4999 -3.794761663
## 5000 -0.066170452
## 5008 0.054174842
## 5014 -0.056210141
## 5024 2.495057358
## 5037 -0.361874423
## 5039 -3.254000916
## 5064 -0.689857823
## 5066 0.333674645
## 5085 0.076754586
## 5089 -3.017833486
## 5093 0.874594810
## 5095 0.726078606
## 5110 3.232243854
## 5118 -1.230394928
## 5125 -1.201501326
## 5145 3.181791057

```

```
## 5149 -1.049956437
## 5162 -0.993966373
## 5165  1.287142498
## 5168  1.077574243
## 5172  -0.106427786
## 5175  3.109315617
## 5176  -1.728306363
## 5181  -1.255530055
## 5184  -1.212731613
## 5189  -2.687920664
## 5193  -0.039792516
## 5213  -0.060560042
## 5214  -0.541387202
## 5216  0.062822527
## 5243  3.524748734
## 5255  0.798358152
## 5256  0.434388753
## 5261  -3.265905991
## 5264  -0.734165378
## 5268  0.204325509
## 5278  -1.781181895
## 5297  1.521776928
## 5300  0.831908805
## 5307  -1.456203203
## 5328  -0.465245943
## 5331  -1.042104582
## 5338  0.866786928
## 5354  -1.986919279
## 5361  1.413376962
## 5381  -0.183666967
## 5382  -1.223301672
## 5392  2.129220403
## 5427  -0.772003388
## 5434  1.478703294
## 5439  0.530668537
## 5442  -2.069074533
## 5449  -1.578777366
## 5454  -1.787394032
## 5468  0.342311192
## 5478  -0.359167952
## 5484  0.860587470
## 5500  0.076289524
## 5521  -1.318707617
## 5525  -3.445017740
## 5530  -0.804250588
## 5543  -0.764964361
## 5547  -0.596106827
## 5559  -1.686782066
## 5561  -1.018387833
## 5563  1.046011462
## 5567  -0.687196365
## 5570  -0.688357472
## 5573  0.443910889
## 5590  -1.118689949
```

```
## 5598 -0.010076161
## 5602 -0.798425585
## 5605 -0.990819866
## 5615 -0.659196788
## 5646 -0.328982474
## 5658 -0.105853658
## 5667 -2.039608104
## 5704 1.486600159
## 5709 -1.542036553
## 5710 0.221769022
## 5718 0.831461690
## 5721 1.540934841
## 5727 -0.260332802
## 5728 2.702244917
## 5729 0.460496552
## 5737 1.222040353
## 5743 -1.428929828
## 5750 2.290742076
## 5752 -0.319387381
## 5757 -1.084261099
## 5764 -2.356932520
## 5767 0.452761507
## 5768 1.088893565
## 5773 0.492301526
## 5797 1.481671414
## 5799 0.634556860
## 5807 2.768661643
## 5824 -1.990123217
## 5829 -0.454047667
## 5830 0.049129967
## 5838 0.375108714
## 5839 -0.449383868
## 5859 0.756316516
## 5863 -0.950260950
## 5865 -2.748101252
## 5899 -0.509993693
## 5901 -0.689946272
## 5907 -1.322690844
## 5916 0.448666698
## 5920 -1.140139580
## 5929 -1.239505149
## 5934 -0.242455139
## 5935 -2.249609223
## 5945 -0.613512607
## 5953 -0.351572565
## 5954 0.882346245
## 5966 0.752966427
## 5980 -0.812702992
## 5986 0.177370388
## 5993 -0.144457176
## 6003 0.928312708
## 6013 0.418918684
## 6024 -0.011628098
## 6050 -1.178861176
```

```
## 6051 -0.434605021
## 6057  1.344151537
## 6059 -1.871832155
## 6065  1.653755893
## 6087 -3.236194323
## 6110  0.212760027
## 6134 -2.735866680
## 6143  0.356518419
## 6154 -1.201874137
## 6160  0.356604979
## 6162 -0.676045072
## 6177  1.065906283
## 6186 -1.546017008
## 6188  3.841075996
## 6190  0.3655529819
## 6194 -0.285567035
## 6197  1.145297938
## 6201 -0.279085590
## 6221 -1.882687189
## 6222  0.290491225
## 6223  0.257249275
## 6228  1.507104578
## 6236 -2.057741881
## 6238  3.091752691
## 6240 -2.053215166
## 6255 -3.107582256
## 6256 -0.654346388
## 6257 -0.154152757
## 6263 -0.873375923
## 6264  1.377409082
## 6270 -1.469488758
## 6275  0.172088204
## 6277 -1.843302710
## 6283 -0.472589593
## 6287  1.870662181
## 6293 -0.752699860
## 6307  2.045701777
## 6308 -2.229026981
## 6310  0.536871873
## 6352  0.417523520
## 6357 -2.443684213
## 6366  0.330691287
## 6381 -1.414251935
## 6388 -0.177375981
## 6389  1.454223128
## 6393  1.028328658
## 6407  0.237174429
## 6410 -3.359675466
## 6413 -0.100394480
## 6419  0.491962329
## 6428  0.090445850
## 6429  0.073369718
## 6438  0.623757338
## 6443 -0.051000286
```

```
## 6457 -0.283960567
## 6459 -0.734880438
## 6474 -1.089954921
## 6488 0.041996763
## 6489 -0.828394120
## 6492 2.929878426
## 6499 0.276422130
## 6506 0.377807217
## 6511 0.159764355
## 6514 -0.221345230
## 6535 1.097024447
## 6555 1.860161336
## 6563 0.040427436
## 6567 2.852812765
## 6568 -1.339818137
## 6574 1.328168303
## 6582 -0.610633541
## 6590 -1.502925873
## 6597 -0.196813255
## 6604 -0.007599243
## 6613 -1.875070826
## 6638 -1.800795005
## 6652 -0.766151362
## 6674 -1.464886359
## 6697 3.084478560
## 6699 -1.208034466
## 6707 -2.301511355
## 6728 0.367136917
## 6736 -2.840527636
## 6762 0.576925445
## 6772 -0.154783064
## 6787 -1.922926714
## 6790 -2.370056677
## 6791 1.399037831
## 6792 -2.422115306
## 6793 3.438915605
## 6806 -0.931932160
## 6836 0.366440591
## 6856 1.794787043
## 6863 -1.937740401
## 6865 1.714851920
## 6880 -0.755011197
## 6898 1.397776659
## 6903 1.433607155
## 6919 -1.589625765
## 6931 -0.757892730
## 6953 0.729744001
## 6955 0.110405383
## 6958 -0.148026375
## 6971 -1.195306861
## 6974 -0.537114974
## 6979 -0.035946822
## 7010 -1.585993674
## 7014 0.772023750
```

```
## 7023 -1.010155491
## 7030 -0.003612963
## 7033 -0.512349491
## 7050 -0.074070105
## 7064 0.872863317
## 7085 0.783341933
## 7088 1.322524637
## 7091 0.066372736
## 7094 -2.696882416
## 7095 0.958249262
## 7109 1.003858589
## 7112 -0.166083678
## 7118 -1.202898479
## 7127 1.808584704
## 7131 2.553589468
## 7132 1.004126159
## 7134 1.452385910
## 7137 -0.589226555
## 7155 -1.957727605
## 7160 -0.300839380
## 7169 -0.452165828
## 7177 -0.572074857
## 7182 -3.865603602
## 7192 0.179718374
## 7199 1.009021277
## 7203 0.790527651
## 7208 -0.677582340
## 7209 -2.122695749
## 7210 -1.485549803
## 7220 -0.383753286
## 7224 0.601995348
## 7243 3.508329545
## 7247 -0.265646379
## 7263 -1.097432492
## 7264 0.650054252
## 7266 1.029241406
## 7267 0.580320496
## 7288 0.216734478
## 7296 2.813148544
## 7299 -0.428200224
## 7300 0.241698655
## 7304 -0.618566054
## 7310 -0.251795265
## 7324 0.803466897
## 7327 -0.387096274
## 7331 -2.458198486
## 7334 3.271251886
## 7345 -1.235321207
## 7348 -1.204883308
## 7350 -0.475087182
## 7355 -0.750467429
## 7366 -3.747747186
## 7371 -1.057746275
## 7409 0.398258977
```

```
## 7412  1.618480924
## 7419  2.152198062
## 7426 -0.022921502
## 7433 -0.291864685
## 7453 -0.706729518
## 7457  0.546157071
## 7464 -1.307255653
## 7475  0.237396892
## 7477 -0.396897731
## 7482  2.144641446
## 7486 -0.594981392
## 7502  4.070444704
## 7504  0.645732882
## 7510 -2.335501950
## 7518  1.044576263
## 7525  0.768758087
## 7535  0.409955070
## 7552 -3.352446676
## 7555 -0.072824129
## 7564  3.543178781
## 7583 -0.116772745
## 7586  2.573376450
## 7596  0.272785987
## 7597 -0.344631872
## 7602  0.948820169
## 7607  0.130255440
## 7626  2.235308232
## 7641 -3.516968421
## 7649 -3.158319588
## 7674  2.615764362
## 7678  3.889640980
## 7697 -0.443672499
## 7703  3.268950541
## 7707  0.223553661
## 7721  0.180213606
## 7726 -1.466105388
## 7737  2.581719171
## 7747  1.668823764
## 7752 -2.023478313
## 7767 -0.463449122
## 7774  1.208954136
## 7781  1.401741885
## 7784 -0.199321299
## 7788 -1.396108667
## 7790 -2.421751196
## 7796 -1.421034252
## 7799 -1.665452036
## 7810  1.147845922
## 7813 -0.095345396
## 7826 -0.693624510
## 7830  0.729004618
## 7834 -1.761721791
## 7839 -1.294624179
## 7857 -0.482255789
```

```
## 7870  0.865981659
## 7876 -3.612522593
## 7887  1.807621945
## 7904 -1.227364885
## 7910 -3.504051552
## 7913  1.481611635
## 7916 -0.706249863
## 7924 -0.508728205
## 7930  2.801873418
## 7933 -3.748853557
## 7948  2.037446023
## 7968  2.098397722
## 7978  2.253646437
## 7985  0.352213513
## 8025  0.366645200
## 8041 -0.316894198
## 8047 -0.321546644
## 8050  0.717049360
## 8052  2.098108058
## 8066  1.276912990
## 8070  3.016994915
## 8085 -0.006495634
## 8096 -0.364161404
## 8103  3.121299671
## 8113  0.134641007
## 8115  1.881280429
## 8122  1.519636326
## 8129 -0.198420410
## 8132 -1.346489331
## 8135 -1.682468738
## 8136  0.643481585
## 8138 -1.188974626
## 8140  0.418754259
## 8141  2.008489462
## 8153  1.108637043
## 8164 -0.681735634
## 8170 -2.036966309
## 8173 -1.873308946
## 8188  1.836405526
## 8218  2.704137549
## 8223 -1.042031363
## 8229  1.417268267
## 8230 -0.329317198
## 8232  3.213568597
## 8243  0.469784184
## 8253 -0.061290334
## 8287  3.556697132
## 8312  0.771878870
## 8327  1.172055020
## 8331 -2.004661551
## 8347 -0.148428399
## 8352 -1.286739541
## 8360 -0.442608999
## 8361 -0.442553563
```

```

## 8368 -2.363742964
## 8372 -0.021960939
## 8393 1.003025219
## 8395 -0.539229647
## 8403 -0.399060936
## 8410 1.255882005
## 8418 2.565533222
## 8419 0.016354980
## 8433 0.310616541
## 8447 -0.027401188
## 8457 -0.507338413
## 8459 -0.066407428
## 8463 -0.556372305
## 8469 -1.262180194
## 8485 0.032311166
## 8501 0.272608201
## 8504 3.829947119
## 8510 -0.427137012
## 8517 0.977455524
## 8534 -0.145197319
## 8535 0.820835559
## 8536 1.009254471
## 8537 -0.289686666
## 8548 -1.823315656
## 8560 0.473849713
## 8565 0.708143881
## 8576 4.045267315
## 8581 3.344029516
## 8583 -1.893012652
## 8586 -0.270421554
## 8591 0.648082915
##
## $biplot
##                                     RDA1      RDA2      RDA3
## scale(subset_indPhen_df$env1_mat) -0.5004451  0.01863416 -0.5476147
## scale(subset_indPhen_df$env2_MTWetQ)  0.4523477  0.19158505 -0.8296969
## scale(subset_indPhen_df$env3_MTDQ) -0.7128197 -0.22757653  0.1200761
## scale(subset_indPhen_df$env4_PDM)   -0.3843437  0.04904761  0.8297919
## scale(subset_indPhen_df$env5_PwarmQ) 0.6524152  0.56221376  0.4505148
## scale(subset_indPhen_df$env6_PWM)    0.3209795 -0.05176393  0.7346369
##
##                                     RDA4      RDA5      RDA6
## scale(subset_indPhen_df$env1_mat)  0.54418964 -0.37298079 -0.1186113
## scale(subset_indPhen_df$env2_MTWetQ) -0.11392353  0.03132509 -0.2373183
## scale(subset_indPhen_df$env3_MTDQ)  0.48309488  0.33816827 -0.2791780
## scale(subset_indPhen_df$env4_PDM)   -0.24744529  0.09707124 -0.3011107
## scale(subset_indPhen_df$env5_PwarmQ) 0.02427266 -0.04630498 -0.2292885
## scale(subset_indPhen_df$env6_PWM)   0.19495732 -0.08780176 -0.5557731
##
## attr(,"const")
## [1] 39.30048

loci.sc <- scores$species
ind.sc <- scores$sites
subset_indPhen_df$RDA1 <- ind.sc[,1]

```

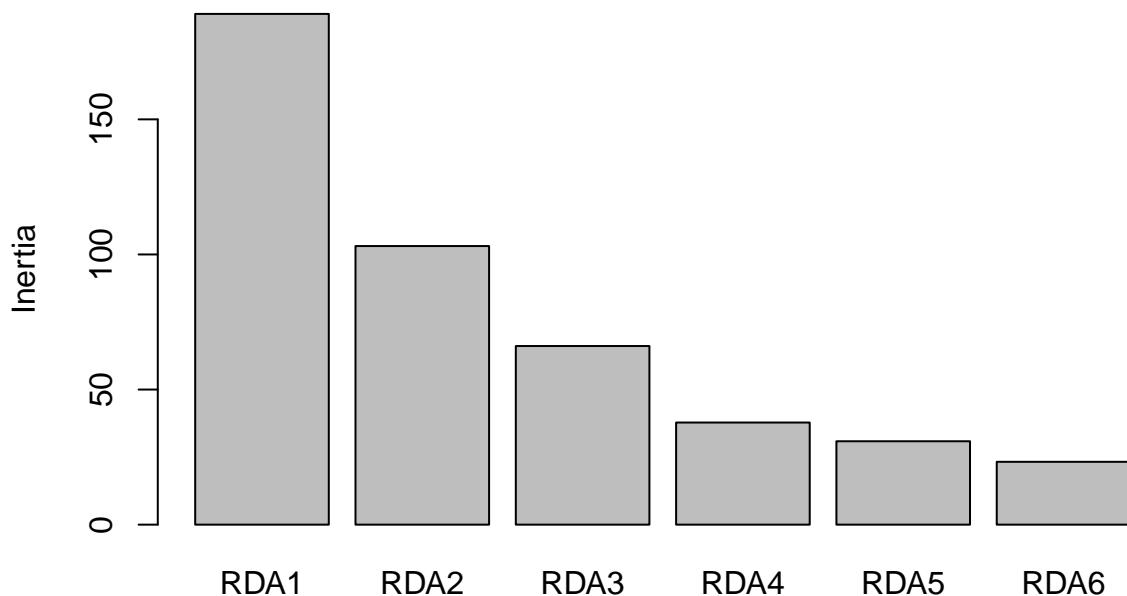
```

subset_indPhen_df$RDA2 <- ind.sc[, 2]
subset_indPhen_df$RDA3 <- ind.sc[, 3]
subset_indPhen_df$RDA4 <- ind.sc[, 4]

a<- screeplot(rdaout)

```

rdaout



```

str(a)

## List of 4
## $ x   : num [1:6] 0.7 1.9 3.1 4.3 5.5 6.7
## $ y   : num [1:6] 189 103.1 66.1 37.8 30.9 ...
## $ xlab: NULL
## $ ylab: NULL

a$y # save this it's the eigenvalues

```

```

## [1] 189.02481 103.10740  66.10749  37.79033  30.86247  23.24983

```

```

prop_var <- round(a$y[1:6]/sum(a$y), 3)
cumsum(prop_var)

```

```

## [1] 0.420 0.649 0.796 0.880 0.949 1.001

```

```

rdaout$CCA$biplot

```

```

##
## scale(subset_indPhen_df$env1_mat)    -0.5004451  0.01863416 -0.5476147
## scale(subset_indPhen_df$env2_MTWetQ)  0.4523477  0.19158505 -0.8296969

```

```

## scale(subset_indPhen_df$env3_MTDQ) -0.7128197 -0.22757653 0.1200761
## scale(subset_indPhen_df$env4_PDM) -0.3843437 0.04904761 0.8297919
## scale(subset_indPhen_df$env5_PwarmQ) 0.6524152 0.56221376 0.4505148
## scale(subset_indPhen_df$env6_PWM) 0.3209795 -0.05176393 0.7346369
##
## RDA4 RDA5 RDA6
## scale(subset_indPhen_df$env1_mat) 0.54418964 -0.37298079 -0.1186113
## scale(subset_indPhen_df$env2_MTWetQ) -0.11392353 0.03132509 -0.2373183
## scale(subset_indPhen_df$env3_MTDQ) 0.48309488 0.33816827 -0.2791780
## scale(subset_indPhen_df$env4_PDM) -0.24744529 0.09707124 -0.3011107
## scale(subset_indPhen_df$env5_PwarmQ) 0.02427266 -0.04630498 -0.2292885
## scale(subset_indPhen_df$env6_PWM) 0.19495732 -0.08780176 -0.5557731

enviRDA=unlist(lapply(strsplit(rownames(rdaout$CCA$biplot), "_"), function(x){x[4]}))
phencols <- grep("phenotype", colnames(indPhen_df))

```

Visualize RDA

```

str(subset_indPhen_df)

## 'data.frame': 1000 obs. of 22 variables:
## $ seed : int 892657863 892657863 892657863 892657863 892657863 892657863 892657863 892657863 892657863 892657863 ...
## $ ind_index : int 33 34 44 45 46 64 65 72 85 106 ...
## $ x : num 0.4062 0.4257 0.6717 0.0175 0.0697 ...
## $ y : num 0.233 0.837 0.582 0.33 0.121 ...
## $ phenotype1_mat : num 0.738 -0.2741 -0.6763 -0.2832 0.0576 ...
## $ phenotype2_MTWetQ: num -0.1914 -0.4283 0.0866 -0.4039 -0.3032 ...
## $ phenotype3_MTDQ : num 0.143 -0.0129 -0.4707 -0.3337 0.7316 ...
## $ phenotype4_PDM : num -0.132 0.221 0.219 -0.201 0.196 ...
## $ phenotype5_PwarmQ: num -0.452 0.229 0.26 -0.346 -0.367 ...
## $ phenotype6_PWM : num -0.5417 0.0666 -0.1035 -0.41 0.1963 ...
## $ env1_mat : num 0.762 -0.339 -0.568 -0.246 -0.121 ...
## $ env2_MTWetQ : num -0.1622 -0.4077 0.0909 -0.2008 -0.3064 ...
## $ env3_MTDQ : num 0.2613 -0.0583 -0.4144 -0.2675 0.7029 ...
## $ env4_PDM : num -0.332 0.288 0.235 -0.265 0.211 ...
## $ env5_PwarmQ : num -0.472 0.199 0.23 -0.39 -0.352 ...
## $ env6_PWM : num -0.4778 0.0177 -0.0535 -0.459 0.2128 ...
## $ indID : int 34 35 45 46 47 65 66 73 86 107 ...
## $ subset : logi TRUE TRUE TRUE TRUE TRUE ...
## $ RDA1 : num -0.8643 -1.1049 1.8957 0.0926 -0.4219 ...
## $ RDA2 : num -0.917 2.169 0.279 -1.908 -3.166 ...
## $ RDA3 : num -0.624 1.484 0.347 -0.206 0.195 ...
## $ RDA4 : num 0.4282 0.387 -3.3501 0.0107 2.8926 ...

plot_env <- function(i, maintext){
  scalea=2
  subset_indPhen_df$color <- subset_indPhen_df[,phencols[i]]
  p1 <- ggplot(subset_indPhen_df) +
    geom_point(aes(x=RDA1, y = RDA2, col=color)) +
    scale_colour_viridis(breaks=seq(-1,1,0.5))+ 
    geom_segment(aes(x=0,y=0,
                     xend=rdaout$CCA$biplot[i,1]*scalea,
```

```

        yend=rdaout$CCA$biplot[i,2]*scalea),
        arrow=arrow(length = unit(0.2,"cm")))+
  geom_text(aes(x=rdaout$CCA$biplot[i,1]*scalea,
                y=rdaout$CCA$biplot[i,2]*scalea,
                label=enviRDA[i]),
            hjust="right", vjust="bottom") + ggtheme + ggtitle(maintext) +
  labs(color="Trait\nnValue")

p2 <- ggplot(subset_indPhen_df) +
  geom_point(aes(x=RDA3, y = RDA4, col=color)) +
  scale_colour_viridis(breaks=seq(-1,1,0.5))++
  geom_segment(aes(x=0,y=0,
                    xend=rdaout$CCA$biplot[i,3]*scalea,
                    yend=rdaout$CCA$biplot[i,4]*scalea),
                arrow=arrow(length = unit(0.2,"cm")))+
  geom_text(aes(x=rdaout$CCA$biplot[i,3]*scalea,
                y=rdaout$CCA$biplot[i,4]*scalea,
                label=enviRDA[i]),
            hjust="right", vjust="bottom") + ggtheme + ggtitle("") +
  labs(color="Stnd.\nEnvi.\nnValue")

grid.arrange(p1,p2, ncol=2)
}
# TO DO OUTPUT TO PDFS

pdf("plots_RDAs.pdf", height=4, width=10)
  plot_env(1, "A) MAT")
  plot_env(2, "B) MTWetQ")
  plot_env(3, "C) MTDQ")
  plot_env(4, "D) PDM")
  plot_env(5, "E) PwarmQ")
  plot_env(6, "F) PWM")
dev.off()

## pdf
## 2

```

Function to Back-calculate RDA trait prediction

```

rdaout$CCA$biplot

##                                     RDA1      RDA2      RDA3
## scale(subset_indPhen_df$env1_mat) -0.5004451 0.01863416 -0.5476147
## scale(subset_indPhen_df$env2_MTWetQ) 0.4523477 0.19158505 -0.8296969
## scale(subset_indPhen_df$env3_MTDQ) -0.7128197 -0.22757653 0.1200761
## scale(subset_indPhen_df$env4_PDM) -0.3843437 0.04904761 0.8297919
## scale(subset_indPhen_df$env5_PwarmQ) 0.6524152 0.56221376 0.4505148
## scale(subset_indPhen_df$env6_PWM) 0.3209795 -0.05176393 0.7346369
##                                     RDA4      RDA5      RDA6
## scale(subset_indPhen_df$env1_mat) 0.54418964 -0.37298079 -0.1186113

```

```

## scale(subset_indPhen_df$env2_MTWetQ) -0.11392353 0.03132509 -0.2373183
## scale(subset_indPhen_df$env3_MTDQ) 0.48309488 0.33816827 -0.2791780
## scale(subset_indPhen_df$env4_PDM) -0.24744529 0.09707124 -0.3011107
## scale(subset_indPhen_df$env5_PwarmQ) 0.02427266 -0.04630498 -0.2292885
## scale(subset_indPhen_df$env6_PWM) 0.19495732 -0.08780176 -0.5557731

rda_trait_pred <- function(rdaobj, env_row, K){
  #rdaobj is RDA object
  #envi row is the row of the environment in the biplot output
  #K is the number of RDA axes
  scores <- scores(rdaobj, choices=1:K)
  ind.sc <- scores$sites
  pred <- matrix(NA, nrow=nrow(ind.sc), ncol=K)
  for (k in 1:K){
    pred[,k] <- ind.sc[,k]*eigenvals(rdaobj)[k]*summary(rdaobj)$biplot[env_row,k]
  }
  trait_pred <- scale(rowSums(pred))
  return(trait_pred)
}

newcols <- paste("rda_trait_pred", 1:6, enviRDA, sep="_")

rdaout_pred <- data.frame(matrix(NA,
                                    nrow=nrow(subset_indPhen_df),
                                    ncol=6)
                           )

colnames(rdaout_pred) <- newcols

# Choose 3 RDA axes that explain 75% of the variation
for (i in 1:6){ # hard coding here!!
  rdaout_pred[,i] <- unlist(rda_trait_pred(rdaout, i, 3))
}
subset_indPhen_df <- cbind(subset_indPhen_df, rdaout_pred)
head(subset_indPhen_df)

##          seed ind_index      x      y phenotype1_mat phenotype2_MTWetQ
## 34 892657863       33 0.4061840 0.233272     0.7379670      -0.1914210
## 35 892657863       34 0.4256970 0.837158    -0.2740810      -0.4283320
## 45 892657863       44 0.6716730 0.581744    -0.6763260      0.0866287
## 46 892657863       45 0.0174659 0.329922    -0.2832210      -0.4039420
## 47 892657863       46 0.0697436 0.121221     0.0576163      -0.3032010
## 65 892657863       64 0.1433610 0.233237     0.2656280      -0.2318730
## phenotype3_MTDQ phenotype4_PDM phenotype5_PwarmQ phenotype6_PWM env1_mat
## 34 0.142992      -0.131894     -0.452497     -0.5416510  0.762432
## 35 -0.012880      0.221058      0.229296     0.0665969 -0.339330
## 45 -0.470671      0.218813      0.260098     -0.1034650 -0.567733
## 46 -0.333718      -0.200554     -0.345915     -0.4100010 -0.245860
## 47 0.731600       0.195679      -0.367110     0.1962960 -0.121500
## 65 0.214004       -0.239776     -0.517086     -0.2582660  0.103057
## env2_MTWetQ env3_MTDQ env4_PDM env5_PwarmQ env6_PWM indID subset
## 34 -0.1622380  0.2612810 -0.332078   -0.471502 -0.4778210  34  TRUE
## 35 -0.4076670 -0.0582962  0.288030    0.198810  0.0176800  35  TRUE

```

```

## 45   0.0909278 -0.4143530  0.234899   0.230255 -0.0535109   45   TRUE
## 46  -0.2007590 -0.2674550 -0.265260  -0.389828 -0.4589790   46   TRUE
## 47  -0.3063790  0.7028580  0.211275  -0.352307  0.2127510   47   TRUE
## 65  -0.2863170  0.1657060 -0.190813  -0.476650 -0.2927740   65   TRUE
##          RDA1      RDA2      RDA3      RDA4 rda_trait_pred_1_mat)
## 34 -0.86430581 -0.9166130 -0.6236796  0.42815736           0.71113715
## 35 -1.10493855  2.1694436  1.4839047  0.38699170           0.38110458
## 45  1.89569056  0.2790137  0.3473426 -3.35012341          -1.32666788
## 46  0.09261835 -1.9084997 -0.2064070  0.01068788          -0.03435832
## 47 -0.42193942 -3.1656751  0.1950282  2.89261642           0.18559815
## 65 -0.48972800 -2.6743048 -0.4102364  1.53197385           0.38850483
##          rda_trait_pred_2_MTWetQ) rda_trait_pred_3_MTDQ) rda_trait_pred_4_PDM)
## 34          -0.4338363       0.7276325       0.196319735
## 35          -0.9983652       0.6003877       1.415511759
## 45          1.1149832      -1.4179971      -0.961392116
## 46          -0.1385528       0.1677459      -0.227134452
## 47          -0.8204453       0.7258162       0.207786435
## 65          -0.5419195       0.6864266      -0.003682457
##          rda_trait_pred_5_PwarmQ) rda_trait_pred_6_PWM)
## 34          -0.9832306      -0.696169112
## 35          0.1857819      -0.058610158
## 45          1.4354370       1.166263029
## 46          -0.5810013       0.051708655
## 47          -1.2668857       0.006861397
## 65          -1.2553170      -0.316284936

```

Compare RDA trait prediction to true trait prediction

```

#TO DO MATRIX FOR BAR GRAPH

RDAbarplot <- matrix(NA, nrow=6, ncol=5)
colnames(RDAbarplot) <- c("RDA", "RDA + nuisance env.", "pRDA - geography", "pRDA - PCs", "Polygenic Sc")
rownames(RDAbarplot) <- c("MAT", "MTWetQ", "MTDQ", "PDM", "PwarmQ", "PWM")

RDAbarplot[,1] <- c(
cor(subset_indPhen_df$phenotype1_mat, subset_indPhen_df$rda_trait_pred_1_mat) ,
cor(subset_indPhen_df$phenotype2_MTWetQ, subset_indPhen_df$rda_trait_pred_2_MTWetQ) ,
cor(subset_indPhen_df$phenotype3_MTDQ, subset_indPhen_df$rda_trait_pred_3_MTDQ) ,
cor(subset_indPhen_df$phenotype4_PDM, subset_indPhen_df$rda_trait_pred_4_PDM) ,
cor(subset_indPhen_df$phenotype5_PwarmQ, subset_indPhen_df$rda_trait_pred_5_PwarmQ) ,
cor(subset_indPhen_df$phenotype6_PWM, subset_indPhen_df$rda_trait_pred_6_PWM)
)

```

Compare with an RDA conditioned on geographic distance

Check if poor performers are correlated with lat/long

```

rdaout_geo <- rda(t(G_full_subset) ~ scale(subset_indPhen_df$env1_mat) +
                     scale(subset_indPhen_df$env2_MTWetQ) +
                     scale(subset_indPhen_df$env3_MTDQ) +
                     scale(subset_indPhen_df$env4_PDM) +

```

```

        scale(subset_indPhen_df$env5_PwarmQ) +
        scale(subset_indPhen_df$env6_PWM) +
        Condition(scale(subset_indPhen_df$x) + scale(subset_indPhen_df$y))
    )

#Make sure the 6 environments correspond to the first 6 rows
summary(rdaout_geo)$biplot

```

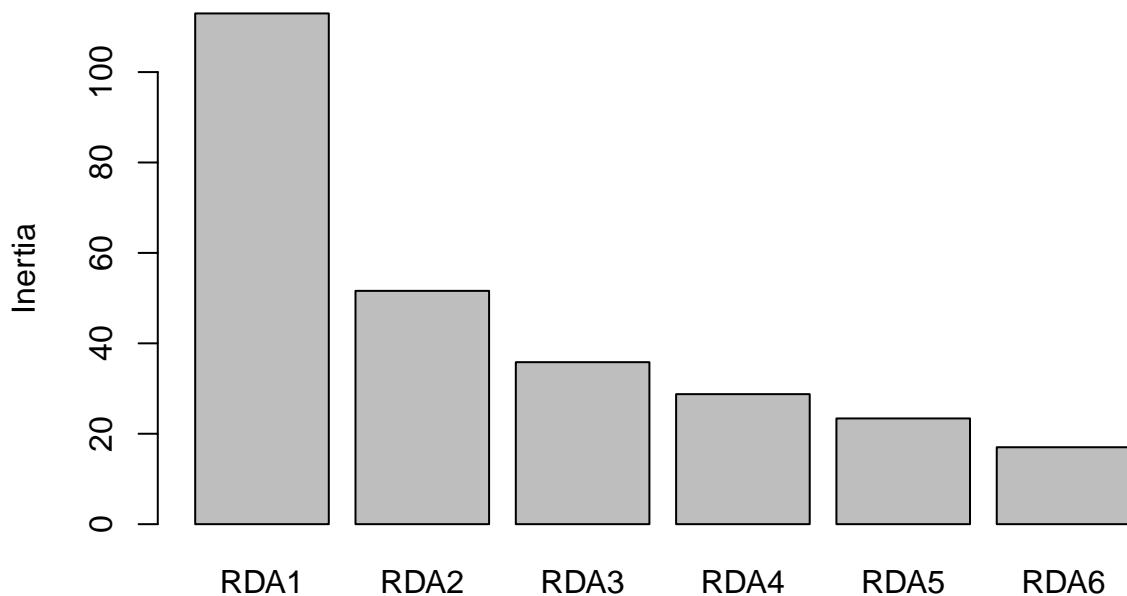
	RDA1	RDA2	RDA3
## scale(subset_indPhen_df\$env1_mat)	0.07702697	0.2642168	0.66800907
## scale(subset_indPhen_df\$env2_MTWetQ)	0.68646173	0.5948603	0.02027582
## scale(subset_indPhen_df\$env3_MTDQ)	-0.33999937	-0.2885079	0.22407096
## scale(subset_indPhen_df\$env4_PDM)	-0.80045183	-0.3231630	-0.10205407
## scale(subset_indPhen_df\$env5_PwarmQ)	-0.07795504	-0.2199656	0.13909133
## scale(subset_indPhen_df\$env6_PWM)	-0.22251793	-0.6220827	0.21337431
	RDA4	RDA5	RDA6
## scale(subset_indPhen_df\$env1_mat)	-0.1266427	-0.28906048	0.33070931
## scale(subset_indPhen_df\$env2_MTWetQ)	0.1467910	0.05597516	0.20358008
## scale(subset_indPhen_df\$env3_MTDQ)	0.4392573	-0.21200267	0.32759539
## scale(subset_indPhen_df\$env4_PDM)	0.2092156	0.40640717	-0.05798559
## scale(subset_indPhen_df\$env5_PwarmQ)	0.1562651	0.26536052	-0.11892913
## scale(subset_indPhen_df\$env6_PWM)	0.1558425	0.48760578	0.22651139

```

enviRDA=unlist(lapply(strsplit(rownames(rdaout_geo$CCA$biplot), " "), function(x){x[4]}))
rdaout_geo_pred <- data.frame(matrix(NA,
                                         nrow=nrow(subset_indPhen_df),
                                         ncol=6)
                               )
colnames(rdaout_geo_pred) <- paste("rdageo_trait_pred", 1:6, enviRDA, sep="_")
par(mfrow=c(1,1))
a<- screeplot(rdaout_geo)

```

rdaout_geo



```
str(a)
```

```
## List of 4
## $ x   : num [1:6] 0.7 1.9 3.1 4.3 5.5 6.7
## $ y   : num [1:6] 113 51.6 35.8 28.8 23.4 ...
## $ xlab: NULL
## $ ylab: NULL
```

```
a$y # save this it's the eigenvalues
```

```
## [1] 112.96852 51.60726 35.83495 28.76307 23.38961 17.01966
```

```
prop_var <- round(a$y[1:6]/sum(a$y),3)
cumsum(prop_var)
```

```
## [1] 0.419 0.610 0.743 0.850 0.937 1.000
```

```
for (i in 1:6){ # hard coding here!!
  rdaout_geo_pred[,i] <- unlist(rda_trait_pred(rdaout_geo, i, 3))
}
head(rdaout_geo_pred)
```

```
##   rdageo_trait_pred_1_mat) rdageo_trait_pred_2_MTWetQ)
## 1                  1.265659          0.2122223
## 2                 -1.532662         -1.7891936
## 3                 -1.577245          0.8289867
## 4                 -1.274725          1.1312103
## 5                 -1.813448          0.3854716
## 6                 -1.117529          0.6353088
```

```

##   rdageo_trait_pred_3_MTDQ) rdageo_trait_pred_4_PDM)
## 1          0.05191658      -0.1128385
## 2          1.51704231      1.7652656
## 3         -1.29831242     -0.7214945
## 4         -1.39281685     -1.4469231
## 5          -0.62334673    -1.0296681
## 6         -0.80838214     -1.0174442
##   rdageo_trait_pred_5_PwarmQ) rdageo_trait_pred_6_PWM)
## 1          -0.07459673    -0.2787735
## 2          1.06983283      1.2927118
## 3         -1.52423656     -1.1955725
## 4         -0.38399735     -0.1817642
## 5          1.06834505      1.2850671
## 6          0.28209085      0.4295221

subset_indPhen_df <- cbind(subset_indPhen_df, rdaout_geo_pred)

RDAbarplot[,3] <- c(
cor(subset_indPhen_df$phenotype1_mat, subset_indPhen_df$rdageo_trait_pred_1_mat) ,
cor(subset_indPhen_df$phenotype2_MTWetQ, subset_indPhen_df$rdageo_trait_pred_2_MTWetQ) ,
cor(subset_indPhen_df$phenotype3_MTDQ, subset_indPhen_df$rdageo_trait_pred_3_MTDQ) ,
cor(subset_indPhen_df$phenotype4_PDM, subset_indPhen_df$rdageo_trait_pred_4_PDM) ,
cor(subset_indPhen_df$phenotype5_PwarmQ, subset_indPhen_df$rdageo_trait_pred_5_PwarmQ) ,
cor(subset_indPhen_df$phenotype6_PWM, subset_indPhen_df$rdageo_trait_pred_6_PWM)
)

```

Compare with an RDA with extra (nuisance) environmental variables

```

head(ext_env)

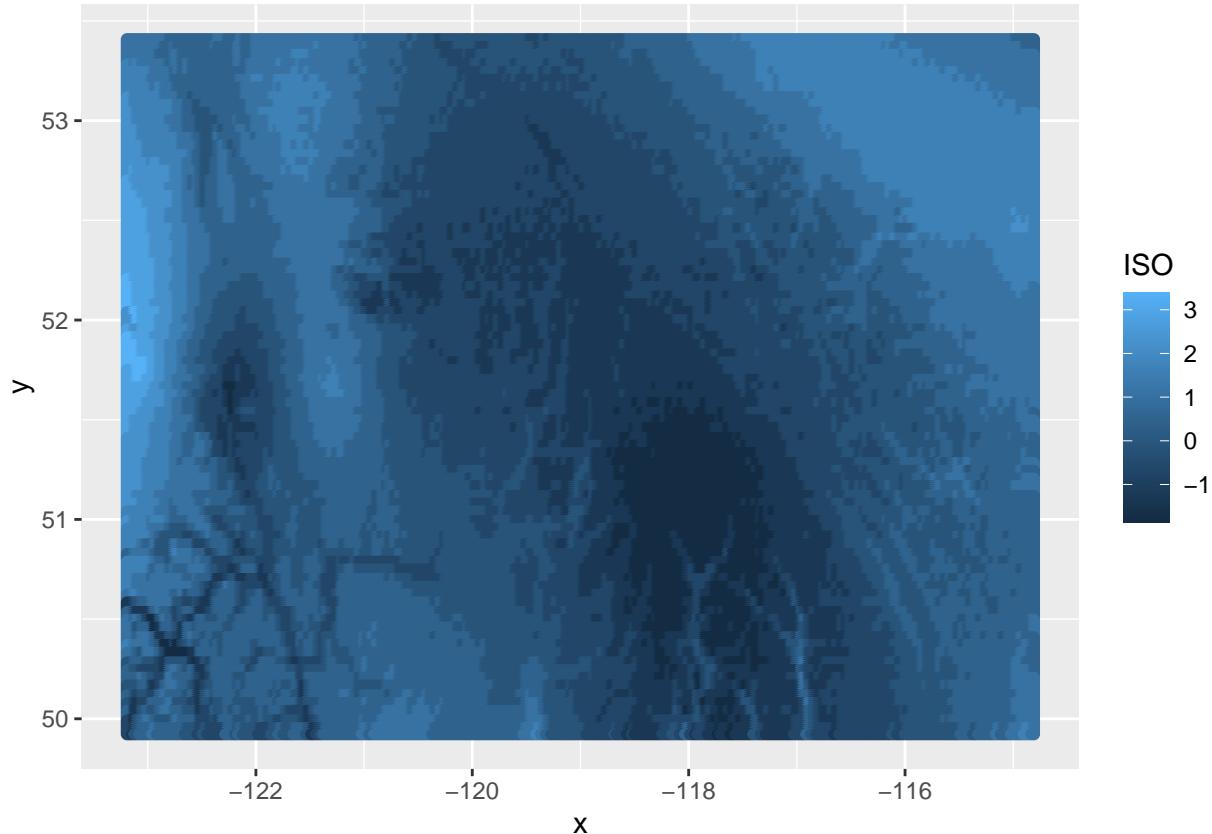
##           x      y      ISO      TSsd      PSsd      slim_x      slim_y
## 360 -123.192 53.408 1.047979 1.229545 -0.16971358 0.000000000      1
## 720 -123.169 53.408 1.047979 1.229545 -0.16971358 0.002743648      1
## 1080 -123.145 53.408 1.047979 1.244671 -0.09319581 0.005606585      1
## 1440 -123.122 53.408 1.047979 1.195933 -0.24623135 0.008350233      1
## 1800 -123.099 53.408 1.047979 1.195933 -0.24623135 0.011093880      1
## 2160 -123.075 53.408 1.047979 1.162320 -0.16971358 0.013956817      1

nearest <- nn2(cbind(ext_env$slim_x, ext_env$slim_y),
                 cbind(subset_indPhen_df$x, subset_indPhen_df$y), k=1
)
head(nearest$nn.idx)

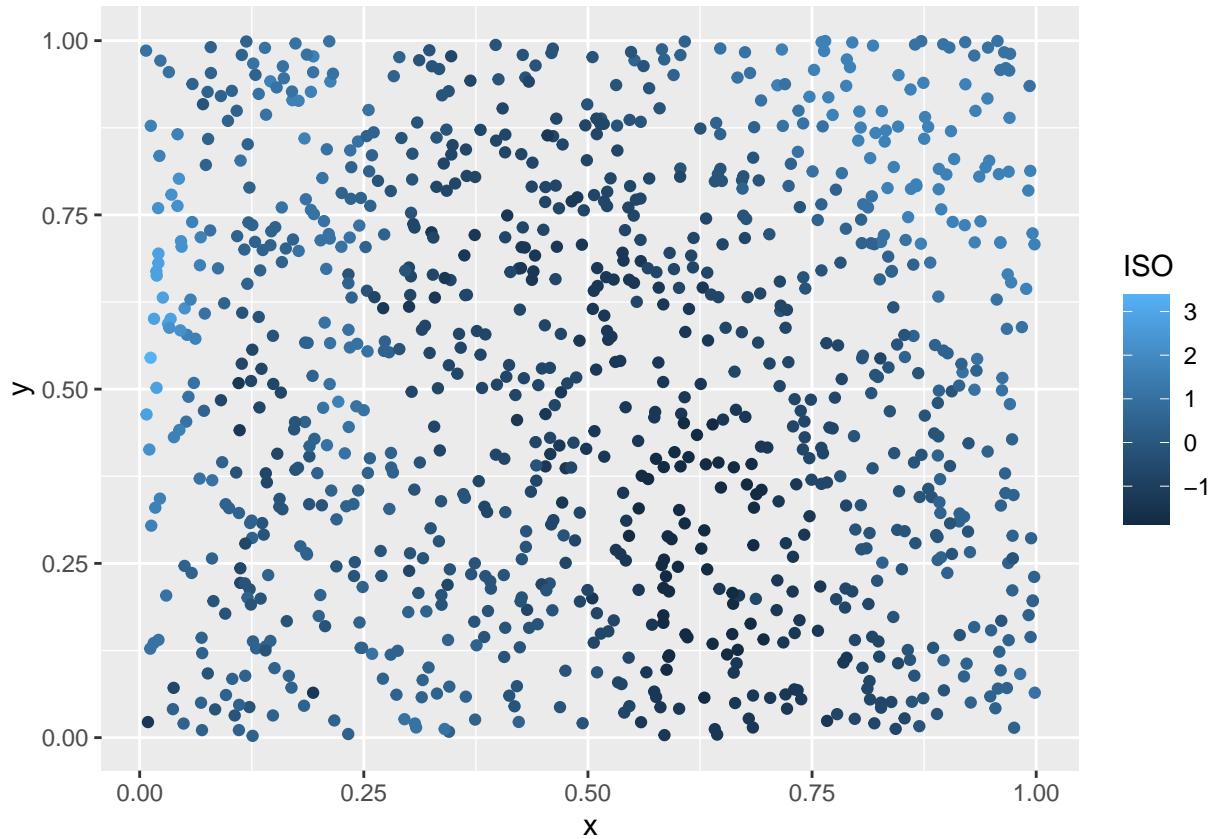
##      [,1]
## [1,] 99147
## [2,] 21034
## [3,] 54242
## [4,] 86767
## [5,] 113426
## [6,] 99052

```

```
subset_indPhen_df$ISO <- ext_env$ISO[unlist(nearest$nn.idx)]
subset_indPhen_df$TSsd <- ext_env$TSsd[unlist(nearest$nn.idx)]
subset_indPhen_df$PSsd <- ext_env$PSsd[unlist(nearest$nn.idx)]
# sanity check
ggplot(ext_env) + geom_point( aes(x=x, y=y, color=ISO))
```



```
ggplot(subset_indPhen_df) + geom_point( aes(x=x, y=y, color=ISO))
```



```
nrow(subset_indPhen_df)
```

```
## [1] 1000
```

```
rdaout_nuisance <- rda(t(G_full_subset) ~ scale(subset_indPhen_df$env1_mat) +
  scale(subset_indPhen_df$env2_MTWetQ) +
  scale(subset_indPhen_df$env3_MTDQ) +
  scale(subset_indPhen_df$env4_PDM) +
  scale(subset_indPhen_df$env5_PwarmQ) +
  scale(subset_indPhen_df$env6_PWM) +
  scale(subset_indPhen_df$ISO) +
  scale(subset_indPhen_df$TSsd) +
  scale(subset_indPhen_df$PSsd)
)
```

#Make sure the 6 environments correspond to the first 6 rows

```
summary(rdaout_nuisance)$biplot
```

	RDA1	RDA2	RDA3
## scale(subset_indPhen_df\$env1_mat)	-0.4841737	-0.08542268	0.52415981
## scale(subset_indPhen_df\$env2_MTWetQ)	0.4105796	0.25620125	0.77527941
## scale(subset_indPhen_df\$env3_MTDQ)	-0.6635284	-0.34612035	-0.07252447
## scale(subset_indPhen_df\$env4_PDM)	-0.3618954	-0.02780810	-0.81790058
## scale(subset_indPhen_df\$env5_PwarmQ)	0.5851695	0.61968501	-0.39849076
## scale(subset_indPhen_df\$env6_PWM)	0.3263428	-0.01388219	-0.65324989
## scale(subset_indPhen_df\$ISO)	0.3183630	0.27913342	0.67174810

```

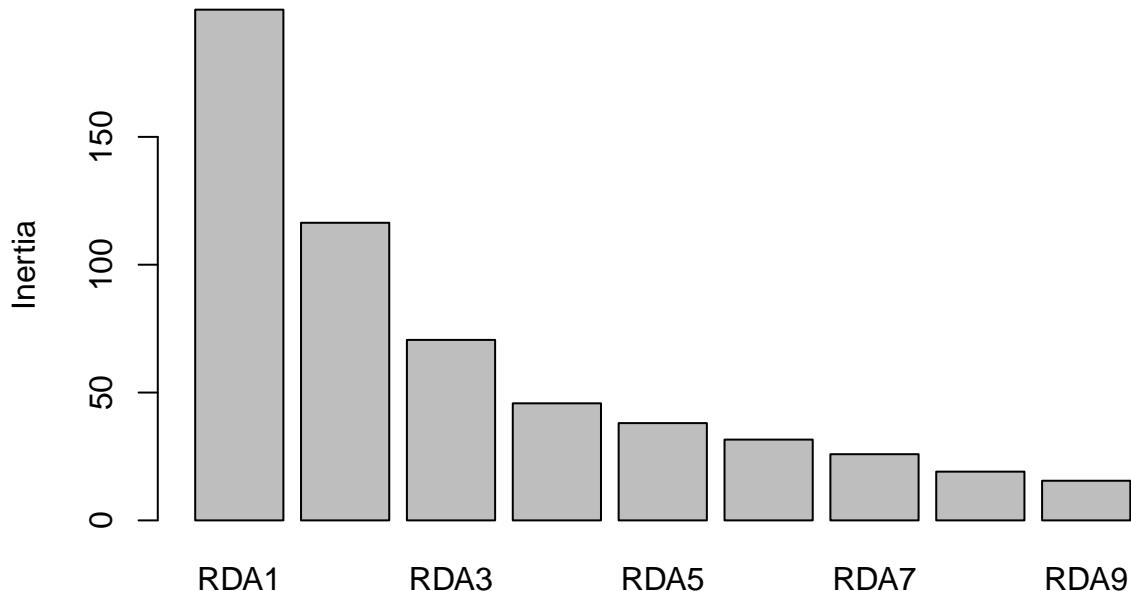
## scale(subset_indPhen_df$TSsd)          0.4677180  0.39870866  0.26604537
## scale(subset_indPhen_df$PSsd)          0.8270525 -0.02497442  0.28433529
##
## scale(subset_indPhen_df$env1_mat)      -0.19047903 0.46495364  0.3264659
## scale(subset_indPhen_df$env2_MTWetQ)   0.31011928 0.03378808  0.1618875
## scale(subset_indPhen_df$env3_MTDQ)     -0.42391086 -0.09766830  0.2427134
## scale(subset_indPhen_df$env4_PDM)      -0.03818407 -0.18799625  0.1364502
## scale(subset_indPhen_df$env5_PwarmQ)   -0.18059636 -0.01594835  0.1818523
## scale(subset_indPhen_df$env6_PWM)      -0.34196883 -0.06449325  0.3270316
## scale(subset_indPhen_df$ISO)           -0.16274840 -0.37716932  0.2458212
## scale(subset_indPhen_df$TSsd)          0.11608919  0.35116955  0.3673550
## scale(subset_indPhen_df$PSsd)          -0.28791998  0.12424421  0.2626120

rdaout_nuis_pred <- data.frame(matrix(NA,
                                         nrow=nrow(subset_indPhen_df),
                                         ncol=6)
)
enviRDA=unlist(lapply(strsplit(rownames(rdaout_nuisance$CCA$biplot), " "), function(x){x[4]}))

colnames(rdaout_nuis_pred)[1:6] <- paste("rdanuis_trait_pred", 1:6, enviRDA[1:6], sep="_")
a<- screeplot(rdaout_nuisance)

```

rdaout_nuisance



```
str(a)
```

```

## List of 4
## $ x : num [1:9] 0.7 1.9 3.1 4.3 5.5 6.7 7.9 9.1 10.3
## $ y : num [1:9] 199.8 116.4 70.6 45.8 38.1 ...
## $ xlab: NULL
## $ ylab: NULL

```

```

a$y # save this it's the eigenvalues

## [1] 199.75935 116.40489 70.59256 45.78459 38.05450 31.60225 25.88722
## [8] 19.06714 15.51295

prop_var <- round(a$y[1:6]/sum(a$y),3)
cumsum(prop_var)

## [1] 0.355 0.562 0.687 0.768 0.836 0.892

#could argue to do K=4 here

for (i in 1:6){ # hard coding here!
  rdaout_nuis_pred[,i] <- unlist(rda_trait_pred(rdaout_nuisance, i, 4))
}
head(rdaout_nuis_pred)

##   rdanuis_trait_pred_1_mat) rdanuis_trait_pred_2_MTWetQ)
## 1          0.6084923      -0.48850524
## 2          0.4491354      -1.02180438
## 3         -1.4364204       1.24265894
## 4          0.1769093      -0.07063134
## 5          0.8207876      -0.82251301
## 6          0.7748457      -0.52743763
##   rdanuis_trait_pred_3_MTDQ) rdanuis_trait_pred_4_PDM)
## 1          0.6877259       0.2667669
## 2          0.6462775       1.3772785
## 3         -1.5623358      -0.9360098
## 4          0.2656366      -0.3280166
## 5          1.1626054      -0.1237131
## 6          0.9434404      -0.2093697
##   rdanuis_trait_pred_5_PwarmQ) rdanuis_trait_pred_6_PWM)
## 1          -0.9570092     -0.57886131
## 2          0.1953538      -0.08801275
## 3          1.3851335       0.98984606
## 4          -0.5985907     -0.04442089
## 5          -1.2775622      0.02037090
## 6          -1.2670569     -0.31401065

subset_indPhen_df <- cbind(subset_indPhen_df, rdaout_nuis_pred)

RDAbarplot[,2] <- c(
  cor(subset_indPhen_df$phenotype1_mat, subset_indPhen_df$rdanuis_trait_pred_1_mat) ,
  cor(subset_indPhen_df$phenotype2_MTWetQ, subset_indPhen_df$rdanuis_trait_pred_2_MTWetQ),
  cor(subset_indPhen_df$phenotype3_MTDQ, subset_indPhen_df$rdanuis_trait_pred_3_MTDQ) ,
  cor(subset_indPhen_df$phenotype4_PDM, subset_indPhen_df$rdanuis_trait_pred_4_PDM) ,
  cor(subset_indPhen_df$phenotype5_PwarmQ, subset_indPhen_df$rdanuis_trait_pred_5_PwarmQ),
  cor(subset_indPhen_df$phenotype6_PWM, subset_indPhen_df$rdanuis_trait_pred_6_PWM)
)

```

PCA

```
write.table(t(G_full_subset), paste0(seed, "genotypes.txt"), row.names=FALSE)

lfmmfile <- paste0(seed, "_genotypes.lfmm")

write.lfmm(t(G_full_subset), lfmmfile)

## [1] "892657863_genotypes.lfmm"

#dim(rbind(subset_indPhen_df$ind_index, t(G_full_subset)))

pc = pca(lfmmfile, 20, scale = TRUE)

## [1] "*****"
## [1] " Principal Component Analysis "
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)            26371
##      -K (number of principal components) 20
##      -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multip
##      -a (eigenvalue file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multip
##      -e (eigenvector file)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multip
##      -d (standard deviation file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multip
##      -p (projection file)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multip
##      -s data centered and scaled

#saveRDS(pc,paste0(path, seed, "_pca.RDS"))
print("calculated pca")

## [1] "calculated pca"

str(pc)

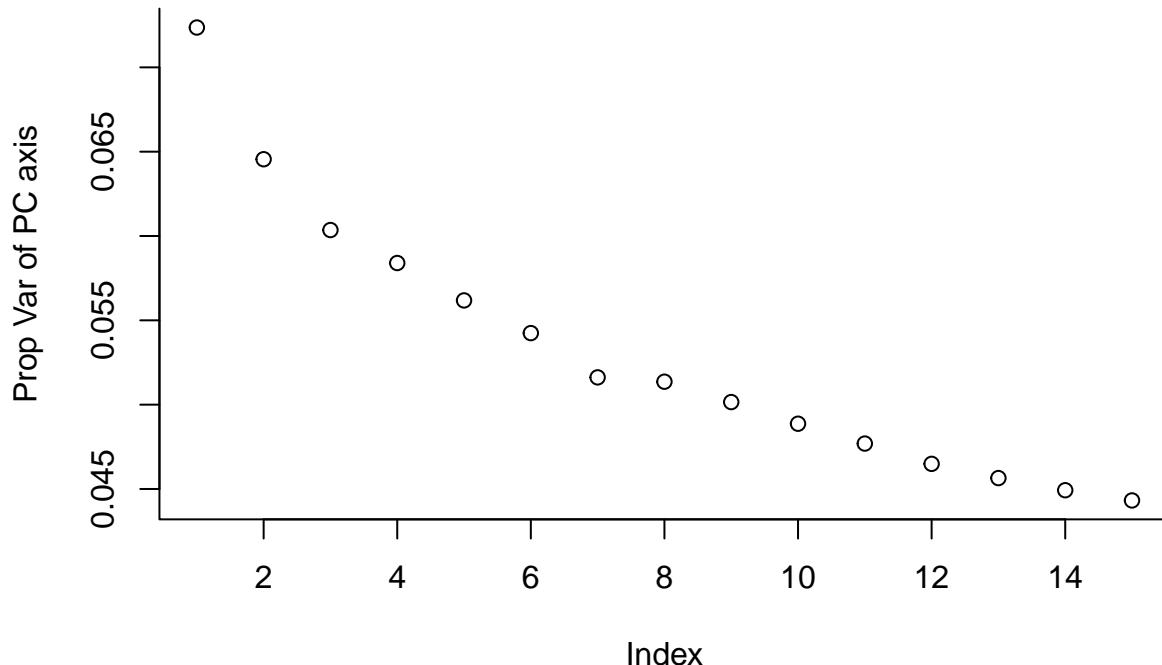
## Formal class 'pcaProject' [package "LEA"] with 13 slots
##   ..@ projDir       : chr "/Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/"
##   ..@ pcaDir        : chr "892657863_genotypes.pca/"
##   ..@ n             : int 1000
##   ..@ L             : int 26371
##   ..@ K             : int 20
##   ..@ center        : logi TRUE
##   ..@ scale          : logi TRUE
##   ..@ pcaProject.file : chr "892657863_genotypes.pcaProject"
##   ..@ input.file     : chr "892657863_genotypes.lfmm"
##   ..@ eigenvalue.file : chr "892657863_genotypes.eigenvalues"
##   ..@ eigenvector.file: chr "892657863_genotypes.eigenvectors"
##   ..@ sdev.file      : chr "892657863_genotypes.sdev"
##   ..@ projection.file : chr "892657863_genotypes.projections"
```

```

subset_indPhen_df$PC1 <- pc$projections[,1]
subset_indPhen_df$PC2 <- pc$projections[,2]
subset_indPhen_df$PC3 <- pc$projections[,3]
propvarpc <- pc$sdev[1:15]/sum(pc$sdev)
plot(propvarpc, bty="l", ylab="Prop Var of PC axis",
     main=paste0(plotmain, "; K=", 20), cex.main=0.5)

```

Mutivariate simulation; K=20



```

pdf("plots_PCA.pdf", width=5, height=4)
ggplot(subset_indPhen_df) + geom_point(aes(x=PC1, y=PC2, color=x), size=5) +
  scale_color_viridis(option="magma") +
  geom_point(aes(x=PC1, y=PC2, fill=y), size=2, pch=21) + ggtheme +
  scale_fill_viridis(option="mako")
dev.off()

```

```

## pdf
## 2

```

Compare with an RDA conditioned on PC axes

```

rdaout_PC <- rda(t(G_full_subset) ~ scale(subset_indPhen_df$env1_mat) +
  scale(subset_indPhen_df$env2_MTWetQ) +
  scale(subset_indPhen_df$env3_MTDQ) +
  scale(subset_indPhen_df$env4_PDM) +
  scale(subset_indPhen_df$env5_PwarmQ) +
  scale(subset_indPhen_df$env6_PWM) +
  Condition(scale(subset_indPhen_df$PC1) + scale(subset_indPhen_df$PC2))

```

```

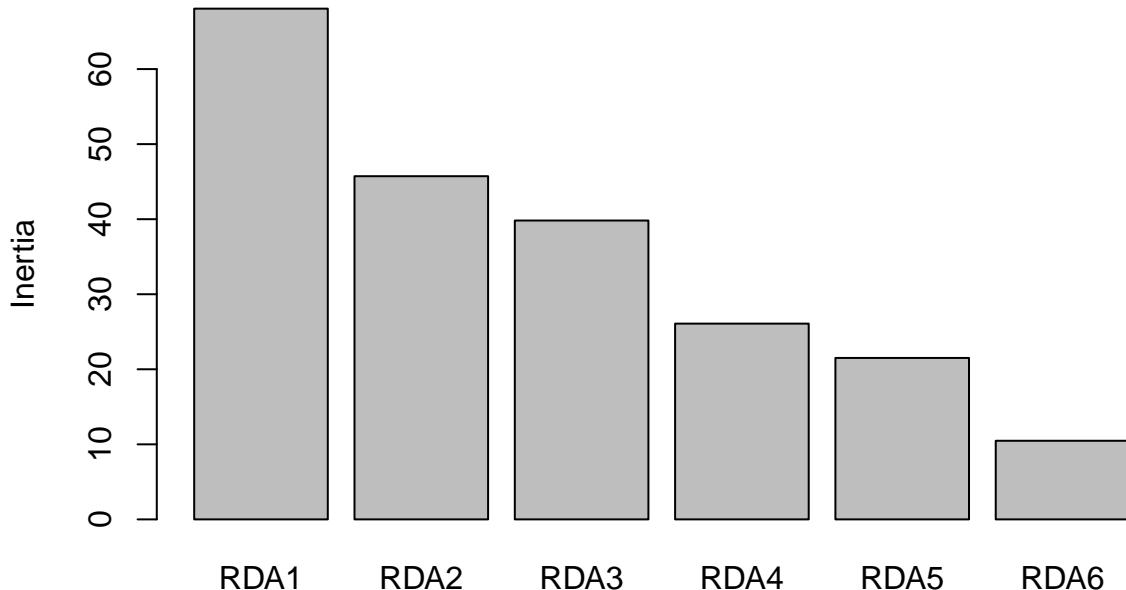
)
#Make sure the 6 environments correspond to the first 6 rows
summary(rdaout_PC)$biplot

##                                     RDA1        RDA2        RDA3
## scale(subset_indPhen_df$env1_mat) -0.5245376 -0.02602815 0.53762964
## scale(subset_indPhen_df$env2_MTWetQ) -0.8355882 -0.10039282 -0.17111890
## scale(subset_indPhen_df$env3_MTDQ) 0.1598580 0.36303218 0.33114690
## scale(subset_indPhen_df$env4_PDM) 0.8539226 -0.17647528 -0.15941117
## scale(subset_indPhen_df$env5_PwarmQ) 0.4164786 -0.35392980 0.09531554
## scale(subset_indPhen_df$env6_PWM) 0.6698288 -0.06505497 0.33098469
##                                     RDA4        RDA5        RDA6
## scale(subset_indPhen_df$env1_mat) -0.03502722 -0.03389235 -0.488585809
## scale(subset_indPhen_df$env2_MTWetQ) 0.16471284 0.17138814 -0.041821956
## scale(subset_indPhen_df$env3_MTDQ) 0.47960365 -0.04034418 -0.220134703
## scale(subset_indPhen_df$env4_PDM) 0.23489663 0.19600377 -0.007685675
## scale(subset_indPhen_df$env5_PwarmQ) 0.19306406 0.13994570 0.099504427
## scale(subset_indPhen_df$env6_PWM) 0.24950964 0.52471022 0.049321000

enviRDA=unlist(lapply(strsplit(rownames(rdaout_PC$CCA$biplot), "_"), function(x){x[4]}))
rdaout_pc_pred <- data.frame(matrix(NA,
                                         nrow=nrow(subset_indPhen_df),
                                         ncol=6))
)
colnames(rdaout_pc_pred) <- paste("rdapc_trait_pred", 1:6, enviRDA, sep="_")
a<- screeplot(rdaout_PC)

```

rdaout_PC



```

str(a)

## List of 4
## $ x : num [1:6] 0.7 1.9 3.1 4.3 5.5 6.7
## $ y : num [1:6] 68.1 45.7 39.8 26.1 21.5 ...
## $ xlab: NULL
## $ ylab: NULL

a$y # save this it's the eigenvalues

## [1] 68.05155 45.72809 39.82016 26.08374 21.50990 10.47522

prop_var <- round(a$y[1:6]/sum(a$y),3)
cumsum(prop_var)

## [1] 0.322 0.538 0.726 0.849 0.951 1.000

for (i in 1:6){ # hard coding here!
  rdaout_pc_pred[,i] <- unlist(rda_trait_pred(rdaout_PC, i, 3))
}
head(rdaout_pc_pred)

##   rdapc_trait_pred_1_mat) rdapc_trait_pred_2_MTWetQ) rdapc_trait_pred_3_MTDQ)
## 1          0.88799537          0.51204838         -0.3994751
## 2         -1.26072461         -1.36012051          0.8169536
## 3        -1.98748441         -0.12348776         -1.1113356
## 4         0.08886399          0.14199912          0.7654236
## 5         0.11644354         -0.64282865          3.3399573
## 6         0.45251146          0.04301893          1.7590482
##   rdapc_trait_pred_4_PDM) rdapc_trait_pred_5_PwarmQ) rdapc_trait_pred_6_PWM)
## 1         -0.4898052          0.07987374         -0.2309161
## 2          1.2658767          0.82945601          1.1936669
## 3          0.7224157         -0.20814359         -0.4676039
## 4         -0.4182877         -0.91134576         -0.3645721
## 5         -0.4881793         -1.83352153          0.1364665
## 6         -0.6946252         -1.38421794         -0.3045637

subset_indPhen_df <- cbind(subset_indPhen_df, rdaout_pc_pred)

RDAbarplot

##                  RDA RDA + nuisance env. pRDA - geography pRDA - PCs
## MAT      0.6461756      0.6531884      0.5949827      NA
## MTWetQ  0.8066352      0.8042168      0.7933902      NA
## MTDQ    0.7152864      0.7511792      0.4388215      NA
## PDM     0.7366390      0.7343335      0.7633153      NA
## PwarmQ 0.8571310      0.8535961      0.2527603      NA
## PWM     0.6190757      0.6315349      0.6415677      NA
##           Polygenic Score - GEA outliers
## MAT             NA

```

```

## MTWetQ NA
## MTDQ NA
## PDM NA
## PwarmQ NA
## PWM NA

RDAbarplot[,4] <- c(
  cor(subset_indPhen_df$phenotype1_mat, subset_indPhen_df$rdapc_trait_pred_1_mat) ,
  cor(subset_indPhen_df$phenotype2_MTWetQ, subset_indPhen_df$rdapc_trait_pred_2_MTWetQ) ,
  cor(subset_indPhen_df$phenotype3_MTDQ, subset_indPhen_df$rdapc_trait_pred_3_MTDQ) ,
  cor(subset_indPhen_df$phenotype4_PDM, subset_indPhen_df$rdapc_trait_pred_4_PDM) ,
  cor(subset_indPhen_df$phenotype5_PwarmQ, subset_indPhen_df$rdapc_trait_pred_5_PwarmQ) ,
  cor(subset_indPhen_df$phenotype6_PWM, subset_indPhen_df$rdapc_trait_pred_6_PWM)
)

head(subset_indPhen_df)

##          seed ind_index      x      y phenotype1_mat phenotype2_MTWetQ
## 34 892657863       33 0.4061840 0.233272     0.7379670 -0.1914210
## 35 892657863       34 0.4256970 0.837158    -0.2740810 -0.4283320
## 45 892657863       44 0.6716730 0.581744    -0.6763260  0.0866287
## 46 892657863       45 0.0174659 0.329922    -0.2832210 -0.4039420
## 47 892657863       46 0.0697436 0.121221     0.0576163 -0.3032010
## 65 892657863       64 0.1433610 0.233237     0.2656280 -0.2318730
## phenotype3_MTDQ phenotype4_PDM phenotype5_PwarmQ phenotype6_PWM env1_mat
## 34      0.142992   -0.131894     -0.452497 -0.5416510  0.762432
## 35     -0.012880    0.221058      0.229296  0.0665969 -0.339330
## 45     -0.470671    0.218813      0.260098 -0.1034650 -0.567733
## 46     -0.333718   -0.200554     -0.345915 -0.4100010 -0.245860
## 47      0.731600    0.195679     -0.367110  0.1962960 -0.121500
## 65      0.214004   -0.239776     -0.517086 -0.2582660  0.103057
## env2_MTWetQ env3_MTDQ env4_PDM env5_PwarmQ env6_PWM indID subset
## 34     -0.1622380  0.2612810 -0.332078  -0.471502 -0.4778210  34  TRUE
## 35     -0.4076670 -0.0582962  0.288030    0.198810  0.0176800  35  TRUE
## 45      0.0909278 -0.4143530  0.234899    0.230255 -0.0535109  45  TRUE
## 46     -0.2007590 -0.2674550 -0.265260    -0.389828 -0.4589790  46  TRUE
## 47     -0.3063790  0.7028580  0.211275    -0.352307  0.2127510  47  TRUE
## 65     -0.2863170  0.1657060 -0.190813    -0.476650 -0.2927740  65  TRUE
##          RDA1      RDA2      RDA3      RDA4 rda_trait_pred_1_mat)
## 34     -0.86430581 -0.9166130 -0.6236796  0.42815736  0.71113715
## 35     -1.10493855  2.1694436  1.4839047  0.38699170  0.38110458
## 45      1.89569056  0.2790137  0.3473426 -3.35012341 -1.32666788
## 46      0.09261835 -1.9084997 -0.2064070  0.01068788 -0.03435832
## 47     -0.42193942 -3.1656751  0.1950282  2.89261642  0.18559815
## 65     -0.48972800 -2.6743048 -0.4102364  1.53197385  0.38850483
##          rda_trait_pred_2_MTWetQ) rda_trait_pred_3_MTDQ) rda_trait_pred_4_PDM)
## 34        -0.4338363           0.7276325  0.196319735
## 35        -0.9983652           0.6003877  1.415511759
## 45         1.1149832          -1.4179971 -0.961392116
## 46        -0.1385528           0.1677459 -0.227134452
## 47        -0.8204453           0.7258162  0.207786435
## 65        -0.5419195           0.6864266 -0.003682457
##          rda_trait_pred_5_PwarmQ) rda_trait_pred_6_PWM) rdageo_trait_pred_1_mat)
## 34        -0.9832306          -0.696169112  1.265659

```

```

## 35          0.1857819      -0.058610158      -1.532662
## 45          1.4354370      1.166263029      -1.577245
## 46         -0.5810013      0.051708655      -1.274725
## 47         -1.2668857      0.006861397      -1.813448
## 65         -1.2553170      -0.316284936      -1.117529
##   rdageo_trait_pred_2_MTWetQ) rdageo_trait_pred_3_MTDQ)
## 34          0.2122223      0.05191658
## 35         -1.7891936      1.51704231
## 45          0.8289867      -1.29831242
## 46          1.1312103      -1.39281685
## 47          0.3854716      -0.62334673
## 65          0.6353088      -0.80838214
##   rdageo_trait_pred_4_PDM) rdageo_trait_pred_5_PwarmQ)
## 34         -0.1128385      -0.07459673
## 35          1.7652656      1.06983283
## 45         -0.7214945      -1.52423656
## 46         -1.4469231      -0.38399735
## 47         -1.0296681      1.06834505
## 65         -1.0174442      0.28209085
##   rdageo_trait_pred_6_PWM) ISO      TSsd      PSsd
## 34         -0.2787735  -0.1204440  0.7690523  -0.5523024
## 35          1.2927118  -0.7046553  -0.9250244  -1.0114091
## 45         -1.1955725  -0.7046553  -0.7821707  -0.7818557
## 46         -0.1817642   1.6321899  -1.4477009  -0.4757847
## 47          1.2850671   0.4637673  -2.1014666   0.2128753
## 65          0.4295221   0.4637673  -1.3821563  -0.4757847
##   rdanuis_trait_pred_1_mat) rdanuis_trait_pred_2_MTWetQ)
## 34          0.6084923      -0.48850524
## 35          0.4491354      -1.02180438
## 45         -1.4364204      1.24265894
## 46          0.1769093      -0.07063134
## 47          0.8207876      -0.82251301
## 65          0.7748457      -0.52743763
##   rdanuis_trait_pred_3_MTDQ) rdanuis_trait_pred_4_PDM)
## 34          0.6877259      0.2667669
## 35          0.6462775      1.3772785
## 45         -1.5623358      -0.9360098
## 46          0.2656366      -0.3280166
## 47          1.1626054      -0.1237131
## 65          0.9434404      -0.2093697
##   rdanuis_trait_pred_5_PwarmQ) rdanuis_trait_pred_6_PWM)      PC1      PC2
## 34         -0.9570092      -0.57886131   9.029300  -27.7954
## 35          0.1953538      -0.08801275  34.415600  35.0493
## 45          1.3851335      0.98984606  -38.264700  20.2608
## 46         -0.5985907      -0.04442089  -3.625160  -20.9956
## 47         -1.2775622      0.02037090   0.371336  -31.5880
## 65         -1.2670569      -0.31401065  1.326080  -38.0916
##   PC3 rdapc_trait_pred_1_mat) rdapc_trait_pred_2_MTWetQ)
## 34  -0.167126          0.88799537      0.51204838
## 35 -48.397000          -1.26072461      -1.36012051
## 45  -7.927330          -1.98748441      -0.12348776
## 46   9.732080          0.08886399      0.14199912
## 47   8.717150          0.11644354      -0.64282865
## 65  16.684200          0.45251146      0.04301893

```

```

##      rdapc_trait_pred_3_MTDQ) rdapc_trait_pred_4_PDM) rdapc_trait_pred_5_PwarmQ)
## 34          -0.3994751           -0.4898052           0.07987374
## 35          0.8169536            1.2658767           0.82945601
## 45         -1.1113356            0.7224157           -0.20814359
## 46          0.7654236            -0.4182877           -0.91134576
## 47          3.3399573            -0.4881793           -1.83352153
## 65          1.7590482            -0.6946252           -1.38421794
##      rdapc_trait_pred_6_PWM)
## 34          -0.2309161
## 35          1.1936669
## 45          -0.4676039
## 46          -0.3645721
## 47          0.1364665
## 65          -0.3045637

forcor <- subset_indPhen_df[,c(
  which(colnames(subset_indPhen_df)=="x"),
  which(colnames(subset_indPhen_df)=="y"),
  grep("PC1", colnames(subset_indPhen_df)),
  grep("PC2", colnames(subset_indPhen_df)),
  grep("env", colnames(subset_indPhen_df))
)
]
]

pdf("plots_env_PCCors.pdf", width=7, height=5)
corrplot(abs(cor(forcor)), type = "upper")
dev.off()

## pdf
## 2

```

Compare to polygenic score from lfmm outliers

Function for applying the polygenic score fuction in lfmm to the simulated data

From tutorial and functions at:

https://bcm-uga.github.io/lfmm/reference/predict_lfmm.html

<https://cran.r-project.org/web/packages/lfmm/vignettes/lfmm.html>

```

do_lfmm_polygenic_score <- function(env_col_name, phenotype_col_name, FDR=0.05,
                                     G = t(G_full_subset), ind = subset_indPhen_df){
  # env_col_name is the character name of the column with the environment in the `ind` dataframe
  # phenotype_col_name is the character name of the column with the known phenotype in the `ind` dataframe

  # G is a matrix with individuals in rows and SNPs in columns
  env <- matrix(ind[,env_col_name], ncol=1)
  ground_truth_phen <- ind[,phenotype_col_name]
  mod.lfmm <- lfmm_ridge(Y = G,
                           X = env,
                           K = 3)

```

```

pred_GEAoutliers <- predict_lfmm(Y = G,
                                    X = env,
                                    fdr.level = FDR,
                                    mod.lfmm)
numGEAloci <- length(pred_GEAoutliers$candidates)

FDR <- sum(pred_GEAoutliers$candidates %in% which(muts_full$causal))/length(pred_GEAoutliers$candidates)
TPR <- sum(pred_GEAoutliers$candidates %in% which(muts_full$causal))/length(which(muts_full$causal))

cor_GEAoutlierPred_truth <- cor(pred_GEAoutliers$prediction, ground_truth_phen)

return(list(numGEAloci=numGEAloci,
           FDR = FDR,
           TPR = TPR,
           cor_GEAoutlierPred_truth=cor_GEAoutlierPred_truth
           ))
}

t1<- do_lfmm_polygenic_score("env1_mat", "phenotype1_mat")

## Warning in cor(pred_GEAoutliers$prediction, ground_truth_phen): the standard
## deviation is zero

t1

## $numGEAloci
## [1] 0
##
## $FDR
## [1] NaN
##
## $TPR
## [1] 0
##
## $cor_GEAoutlierPred_truth
##      [,1]
## [1,]    NA

t2<- do_lfmm_polygenic_score("env2_MTWetQ", "phenotype2_MTWetQ")
t2

## $numGEAloci
## [1] 12
##
## $FDR
## [1] 0.08333333
##
## $TPR
## [1] 0.01111111
##
## $cor_GEAoutlierPred_truth

```

```

##          [,1]
## [1,] 0.6364808

t3<- do_lfmm_polygenic_score("env3_MTDQ" , "phenotype3_MTDQ" )
t3

## $numGEAloci
## [1] 1817
##
## $FDR
## [1] 0.005503577
##
## $TPR
## [1] 0.1111111
##
## $cor_GEAoutlierPred_truth
##          [,1]
## [1,] 0.7430416

t4 <- do_lfmm_polygenic_score("env4_PDM" , "phenotype4_PDM" )
t4

## $numGEAloci
## [1] 1
##
## $FDR
## [1] 0
##
## $TPR
## [1] 0
##
## $cor_GEAoutlierPred_truth
##          [,1]
## [1,] 0.4705498

t5 <-do_lfmm_polygenic_score("env5_PwarmQ", "phenotype5_PwarmQ")
t5

## $numGEAloci
## [1] 325
##
## $FDR
## [1] 0.01538462
##
## $TPR
## [1] 0.05555556
##
## $cor_GEAoutlierPred_truth
##          [,1]
## [1,] 0.8621557

```

```

t6 <- do_lfmm_polygenic_score("env6_PWM" , "phenotype6_PWM" )

## $numGEAloci
## [1] 296
##
## $FDR
## [1] 0.02702703
##
## $TPR
## [1] 0.088888889
##
## $cor_GEAoutlierPred_truth
##      [,1]
## [1,] 0.6200817

RDAbarplot[,5] <- c(t1$cor_GEAoutlierPred_truth,
                     t2$cor_GEAoutlierPred_truth,
                     t3$cor_GEAoutlierPred_truth,
                     t4$cor_GEAoutlierPred_truth,
                     t5$cor_GEAoutlierPred_truth,
                     t6$cor_GEAoutlierPred_truth)

numoutliers <- c(t1$numGEAloci,
                  t2$numGEAloci,
                  t3$numGEAloci,
                  t4$numGEAloci,
                  t5$numGEAloci,
                  t6$numGEAloci)

FDR <- c(t1$FDR,
          t2$FDR,
          t3$FDR,
          t4$FDR,
          t5$FDR,
          t6$FDR)

plotlab <- paste0("# GEA outliers = ", numoutliers, " (FDR = ", round(FDR,2), ")")

```

RDAbarplot

```

colrs <- c(rocket(2, begin=0, end=0.3), rocket(2, begin=0.9, end=1.0), "cornflowerblue")

pdf("plots_RDApred.pdf", width=7, height=6)
par(mar=c(5,5,1,1))
a<- barplot(t(RDAbarplot), beside = TRUE, las=2, ylim=c(0,1.15), ylab="Cor(Predicted trait value,\nlegend(1.0,1.15,colnames(RDAbarplot), bty="n", fill= colrs)
text(a[5,], rep(0.05,5), plotlab, srt=90, cex=0.7, adj=0)
dev.off()

```

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

Ancestry

```
lfmmfile <- paste0(seed, "_genotypes.lfmm")
obj.snmf <- snmf(lfmmfile, K = 1:20, project = "new", repetitions = 5, tolerance = 0.00001, entropy=TRUE)

## [1] "*****"
## [1] " Conversion from the lfmm format to the geno format"
## [1] "*****"
##
## - number of detected individuals: 1000
## - number of detected loci: 26371
##
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] 505005838
## [1] "*****"
## [1] "*          create.dataset           *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)            26371
##      -s (seed random init)        505005838
##      -r (percentage of masked data) 0.05
##      -x (genotype file in .geno format) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/
##      -o (output file in .geno format) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/
##
## Write genotype file with masked data, /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenogeno
##
## [1] "*****"
## [1] "* sNMF K = 1 repetition 1      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)            26371
##      -K (number of ancestral pops)   1
##      -x (input file)               /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -i (number max of iterations)    200
```

```

##          -a (regularization parameter)      10
##          -s (seed random init)           4651972124974106382
##          -e (tolerance error)            1E-05
##          -p (number of processes)        1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mul
##
##
## Main algorithm:
##
## Least-square error: 1810265.665214
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)             26371
##          -K (number of ancestral pops)   1
##          -x (genotype file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          - diploid
##
## Cross-Entropy (all data):    0.164789
## Cross-Entropy (masked data): 0.166644
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 2 repetition 1      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)             26371
##          -K (number of ancestral pops)   2
##          -x (input file)                /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -g (ancestral frequencies file)/Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -i (number max of iterations)  200
##          -a (regularization parameter)  10
##          -s (seed random init)         4617260654554367758

```

```

##          -e (tolerance error)           1E-05
##          -p (number of processes)        1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m
##
##
## Main algorithm:
## [ ]]
## [=====]
## Number of iterations: 43
##
## Least-square error: 1681845.974894
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   2
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          - diploid
##
## Cross-Entropy (all data):      0.147866
## Cross-Entropy (masked data):   0.150052
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 3 repetition 1      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   3
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -i (number max of iterations)  200
##          -a (regularization parameter)  10

```

```

##          -s (seed random init)          4614152154794018574
##          -e (tolerance error)           1E-05
##          -p (number of processes)        1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu...
## 
## 
## Main algorithm:
## [                                     ]
## [=====]
## Number of iterations: 22
##
## Least-square error: 1601548.951815
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)             26371
##          -K (number of ancestral pops)   3
##          -x (genotype file)            /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):      0.132512
## Cross-Entropy (masked data):  0.134689
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 4  repetition 1      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)             26371
##          -K (number of ancestral pops)   4
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200

```

```

##          -a (regularization parameter)      10
##          -s (seed random init)           4602375324403615502
##          -e (tolerance error)            1E-05
##          -p (number of processes)        1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu
##
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 31
##
## Least-square error: 1562934.209328
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/i
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)             26371
##          -K (number of ancestral pops)   4
##          -x (genotype file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          - diploid
##
## Cross-Entropy (all data):    0.126455
## Cross-Entropy (masked data): 0.128786
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 5  repetition 1      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)             26371
##          -K (number of ancestral pops)   5
##          -x (input file)                /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul

```

```

##          -i (number max of iterations)      200
##          -a (regularization parameter)      10
##          -s (seed random init)            4611721911974086414
##          -e (tolerance error)             1E-05
##          -p (number of processes)         1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu
##
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 32
##
## Least-square error: 1524738.692712
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/
##
## [1] "*****"
## [1] "*   cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  5
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          - diploid
##
## Cross-Entropy (all data):      0.120627
## Cross-Entropy (masked data):  0.12312
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 6  repetition 1      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  6
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul

```

```

## -g (ancestral frequencies file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -i (number max of iterations)           200
## -a (regularization parameter)          10
## -s (seed random init)                 4651972124974106382
## -e (tolerance error)                  1E-05
## -p (number of processes)              1
## - diploid

##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
## 
## 
## Main algorithm:
## [ ] 
## [=====]
## Number of iterations: 28
## 
## Least-square error: 1492387.714592
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
## 
## -n (number of individuals)          1000
## -L (number of loci)                26371
## -K (number of ancestral pops)     6
## -x (genotype file)                /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -q (individual admixture)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -g (ancestral frequencies)        /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -i (with masked genotypes)        /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## - diploid

##
## Cross-Entropy (all data):    0.117705
## Cross-Entropy (masked data):  0.120261
## The project is saved into :
##   892657863_genotypes.snmfProject
## 
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
## 
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
## 
## [1] "*****"
## [1] "* sNMF K = 7 repetition 1      *"
## [1] "*****"
## summary of the options:
## 
## -n (number of individuals)          1000
## -L (number of loci)                26371
## -K (number of ancestral pops)     7
## -x (input file)                  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...

```

```

## -q (individual admixture file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -g (ancestral frequencies file)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -i (number max of iterations)           200
## -a (regularization parameter)          10
## -s (seed random init)                 4799973134
## -e (tolerance error)                  1E-05
## -p (number of processes)               1
## - diploid

##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu...
## 
## 

## Main algorithm:
## [                                     ]
## [=====]
## Number of iterations: 23
## 
## Least-square error: 1474913.976373
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
## 
## -n (number of individuals)          1000
## -L (number of loci)                26371
## -K (number of ancestral pops)       7
## -x (genotype file)                 /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -q (individual admixture)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -g (ancestral frequencies)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -i (with masked genotypes)        /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## - diploid

##
## Cross-Entropy (all data):    0.115899
## Cross-Entropy (masked data):  0.118654
## The project is saved into :
##   892657863_genotypes.snmfProject
## 
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
## 
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
## 
## [1] "*****"
## [1] "* sNMF K = 8  repetition 1      *"
## [1] "*****"
## summary of the options:
## 
## -n (number of individuals)          1000
## -L (number of loci)                26371
## -K (number of ancestral pops)       8

```

```

##      -x (input file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -i (number max of iterations) 200
##      -a (regularization parameter) 10
##      -s (seed random init)        4799973134
##      -e (tolerance error)         1E-05
##      -p (number of processes)     1
##      - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mul...
##
##
## Main algorithm:
## [                                     ]
## [=====]
## Number of iterations: 92
##
## Least-square error: 1437696.439552
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)            26371
##      -K (number of ancestral pops) 8
##      -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      - diploid
##
## Cross-Entropy (all data): 0.110623
## Cross-Entropy (masked data): 0.113488
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 9 repetition 1      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)            26371

```

```

## -K (number of ancestral pops) 9
## -x (input file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -i (number max of iterations) 200
## -a (regularization parameter) 10
## -s (seed random init) 4799973134
## -e (tolerance error) 1E-05
## -p (number of processes) 1
## - diploid

## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
## 
## 
## Main algorithm:
## [ ] 
## [=====]
## Number of iterations: 38
## 
## Least-square error: 1415967.652238
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "* cross-entropy estimation *"
## [1] "*****"
## summary of the options:
## 
## -n (number of individuals) 1000
## -L (number of loci) 26371
## -K (number of ancestral pops) 9
## -x (genotype file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -q (individual admixture) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -g (ancestral frequencies) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -i (with masked genotypes) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## - diploid

## Cross-Entropy (all data): 0.107843
## Cross-Entropy (masked data): 0.110841
## The project is saved into :
## 892657863_genotypes.snmfProject
## 
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
## 
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
## 
## [1] "*****"
## [1] "* sNMF K = 10 repetition 1 *"
## [1] "*****"
## summary of the options:
## 
## -n (number of individuals) 1000

```

```

## -L (number of loci) 26371
## -K (number of ancestral pops) 10
## -x (input file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -i (number max of iterations) 200
## -a (regularization parameter) 10
## -s (seed random init) 13839745686173239054
## -e (tolerance error) 1E-05
## -p (number of processes) 1
## - diploid

##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphen.../output_mu...
## 
## 
## Main algorithm:
## [ ] 
## [=====]
## Number of iterations: 67
## 
## Least-square error: 1391809.352445
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
## 
## -n (number of individuals) 1000
## -L (number of loci) 26371
## -K (number of ancestral pops) 10
## -x (genotype file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -q (individual admixture) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -g (ancestral frequencies) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -i (with masked genotypes) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## - diploid

##
## Cross-Entropy (all data): 0.104086
## Cross-Entropy (masked data): 0.107278
## The project is saved into :
## 892657863_genotypes.snmfProject
## 
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
## 
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
## 
## [1] "*****"
## [1] "* sNMF K = 11 repetition 1      *"
## [1] "*****"
## summary of the options:
## 
```

```

##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)   11
##          -x (input file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -i (number max of iterations)    200
##          -a (regularization parameter)    10
##          -s (seed random init)          4618948739910453006
##          -e (tolerance error)           1E-05
##          -p (number of processes)        1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu
##
##
## Main algorithm:
## [                                     ]
## [=====]
## Number of iterations: 61
##
## Least-square error: 1375939.753012
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)   11
##          -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          - diploid
##
## Cross-Entropy (all data):      0.103209
## Cross-Entropy (masked data):  0.106662
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 12  repetition 1      *"
## [1] "*****"
## summary of the options:

```

```

## -n (number of individuals) 1000
## -L (number of loci) 26371
## -K (number of ancestral pops) 12
## -x (input file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
## -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
## -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
## -i (number max of iterations) 200
## -a (regularization parameter) 10
## -s (seed random init) 4799973134
## -e (tolerance error) 1E-05
## -p (number of processes) 1
## - diploid

## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mul
##
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 36
##
## Least-square error: 1356377.461044
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
## -n (number of individuals) 1000
## -L (number of loci) 26371
## -K (number of ancestral pops) 12
## -x (genotype file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## -q (individual admixture) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## -g (ancestral frequencies) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## -i (with masked genotypes) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## - diploid

## Cross-Entropy (all data): 0.100317
## Cross-Entropy (masked data): 0.103865
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 13 repetition 1      *"
## [1] "*****"

```

```

## summary of the options:
##
##      -n (number of individuals)          1000
##      -L (number of loci)                 26371
##      -K (number of ancestral pops)       13
##      -x (input file)                   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##      -q (individual admixture file)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##      -g (ancestral frequencies file)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##      -i (number max of iterations)     200
##      -a (regularization parameter)    10
##      -s (seed random init)           4651972124974106382
##      -e (tolerance error)            1E-05
##      -p (number of processes)         1
##      - diploid

##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mul-
##
##
## Main algorithm:
## [                                     ]
## [=====]
## Number of iterations: 35
##
## Least-square error: 1334482.340199
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)          1000
##      -L (number of loci)                 26371
##      -K (number of ancestral pops)       13
##      -x (genotype file)                  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##      -q (individual admixture)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##      -g (ancestral frequencies)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##      -i (with masked genotypes)        /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##      - diploid

##
## Cross-Entropy (all data):      0.0984645
## Cross-Entropy (masked data):  0.102213
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
##  project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##  remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 14  repetition 1      *"

```

```

## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)          1000
##      -L (number of loci)                26371
##      -K (number of ancestral pops)     14
##      -x (input file)                  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##      -q (individual admixture file)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##      -g (ancestral frequencies file)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##      -i (number max of iterations)    200
##      -a (regularization parameter)    10
##      -s (seed random init)           13829942745442666254
##      -e (tolerance error)            1E-05
##      -p (number of processes)         1
##      - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu
##
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 45
##
## Least-square error: 1316958.396270
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)          1000
##      -L (number of loci)                26371
##      -K (number of ancestral pops)     14
##      -x (genotype file)                /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##      -q (individual admixture)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##      -g (ancestral frequencies)        /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##      -i (with masked genotypes)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##      - diploid
##
## Cross-Entropy (all data): 0.0969155
## Cross-Entropy (masked data): 0.100741
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"

```

```

## [1] "* sNMF K = 15 repetition 1      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  15
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -i (number max of iterations)   200
##          -a (regularization parameter)  10
##          -s (seed random init)        4586520542824744718
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu-
## 
## 
## Main algorithm:
## [
## [=====]
## Number of iterations: 44
##
## Least-square error: 1306881.131160
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
## 
## [1] "*****"
## [1] "*    cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  15
##          -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          - diploid
##
## Cross-Entropy (all data):    0.0956232
## Cross-Entropy (masked data): 0.0996002
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
##  project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##  remove.snmfProject("892657863_genotypes.snmfProject")
##

```

```

## [1] "*****"
## [1] "* sNMF K = 16 repetition 1      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)   16
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -i (number max of iterations)    200
##           -a (regularization parameter)   10
##           -s (seed random init)         4607889302202468110
##           -e (tolerance error)          1E-05
##           -p (number of processes)       1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mul
##
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 129
##
## Least-square error: 1283936.688172
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)   16
##           -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           -g (ancestral frequencies)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           - diploid
##
## Cross-Entropy (all data):    0.0934107
## Cross-Entropy (masked data): 0.0976251
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")

```

```

## 
## [1] "*****"
## [1] "* sNMF K = 17 repetition 1      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)   17
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -i (number max of iterations)    200
##           -a (regularization parameter)   10
##           -s (seed random init)         4651972124974106382
##           -e (tolerance error)          1E-05
##           -p (number of processes)       1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu-
## 
## 
## Main algorithm:
## [                                     ]
## [=====]
## Number of iterations: 114
## 
## Least-square error: 1276362.696525
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
## 
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)   17
##           -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           - diploid
##
## Cross-Entropy (all data):      0.0929914
## Cross-Entropy (masked data):  0.0973332
## The project is saved into :
##   892657863_genotypes.snmfProject
## 
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
## 
## To remove the project, use:

```

```

## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 18 repetition 1      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops) 18
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -i (number max of iterations) 200
##          -a (regularization parameter) 10
##          -s (seed random init)        4651972124974106382
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu
##
##
## Main algorithm:
##   [
##   =====
## Number of iterations: 46
##
## Least-square error: 1259716.966182
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m
##
## [1] "*****"
## [1] "*    cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops) 18
##          -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          - diploid
##
## Cross-Entropy (all data):      0.0910514
## Cross-Entropy (masked data):  0.0956817
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##

```

```

## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 19  repetition 1      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  19
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -i (number max of iterations)  200
##           -a (regularization parameter) 10
##           -s (seed random init)        4606321286952109838
##           -e (tolerance error)         1E-05
##           -p (number of processes)     1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu...
##
##
## Main algorithm:
##   [
##   =====
## Number of iterations: 34
##
## Least-square error: 1248789.374994
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  19
##           -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           - diploid
##
## Cross-Entropy (all data): 0.0899733
## Cross-Entropy (masked data): 0.0947889
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")

```

```

## 
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 20 repetition 1      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  20
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -i (number max of iterations)   200
##           -a (regularization parameter) 10
##           -s (seed random init)        4569379564569609998
##           -e (tolerance error)         1E-05
##           -p (number of processes)     1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mul-
## 
## 
## Main algorithm:
##   [
##   =====
## Number of iterations: 47
##
## Least-square error: 1236630.460557
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  20
##           -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           - diploid
##
## Cross-Entropy (all data): 0.0894067
## Cross-Entropy (masked data): 0.0942698
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:

```

```

## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] 177889269
## [1] "*****"
## [1] "*      create.dataset      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -s (seed random init)        177889269
##          -r (percentage of masked data) 0.05
##          -x (genotype file in .geno format) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/
##          -o (output file in .geno format) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/
##
## Write genotype file with masked data, /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenogeno
##
## [1] "*****"
## [1] "* sNMF K = 1  repetition 2      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  1
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -i (number max of iterations)   200
##          -a (regularization parameter)  10
##          -s (seed random init)         4597871423801417717
##          -e (tolerance error)          1E-05
##          -p (number of processes)       1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenogeno_multienvi/output_mul-
##
## Main algorithm:
##
## Least-square error: 1810515.369167
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371

```

```

##          -K (number of ancestral pops)      1
##          -x (genotype file)                 /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)        /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):    0.164785
## Cross-Entropy (masked data): 0.166708
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 2 repetition 2      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)             26371
##          -K (number of ancestral pops)  2
##          -x (input file)                /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4607599468892282869
##          -e (tolerance error)          1E-05
##          -p (number of processes)      1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
##
## Main algorithm:
##   [
##   =====
## Number of iterations: 55
##
## Least-square error: 1682097.369467
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000

```

```

##          -L (number of loci)          26371
##          -K (number of ancestral pops) 2
##          -x (genotype file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid                  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##
## Cross-Entropy (all data):      0.147826
## Cross-Entropy (masked data):  0.150192
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 3 repetition 2      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops) 3
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations) 200
##          -a (regularization parameter) 10
##          -s (seed random init)        4616879368505548789
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
##
## Main algorithm:
##  [
##  =====
## Number of iterations: 25
##
## Least-square error: 1601797.884525
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##

```

```

##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   3
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):      0.132513
## Cross-Entropy (masked data):  0.134836
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 4  repetition 2      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   4
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4098470205923680245
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
## Main algorithm:
##   [
##   =====]
## Number of iterations: 16
##
## Least-square error: 1563126.263586
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:

```

```

## -n (number of individuals) 1000
## -L (number of loci) 26371
## -K (number of ancestral pops) 4
## -x (genotype file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -q (individual admixture) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -g (ancestral frequencies) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -i (with masked genotypes) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## - diploid

## Cross-Entropy (all data): 0.126379
## Cross-Entropy (masked data): 0.128869
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 5 repetition 2      *"
## [1] "*****"
## summary of the options:
##
## -n (number of individuals) 1000
## -L (number of loci) 26371
## -K (number of ancestral pops) 5
## -x (input file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -i (number max of iterations) 200
## -a (regularization parameter) 10
## -s (seed random init) 4561741896914460661
## -e (tolerance error) 1E-05
## -p (number of processes) 1
## - diploid

## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
##
## Main algorithm:
## [
## =====
## Number of iterations: 23
##
## Least-square error: 1525480.486161
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"

```

```

## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)           26371
##      -K (number of ancestral pops)   5
##      -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):      0.120648
## Cross-Entropy (masked data):  0.123288
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 6 repetition 2      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)           26371
##      -K (number of ancestral pops)   6
##      -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -i (number max of iterations)  200
##      -a (regularization parameter) 10
##      -s (seed random init)        4651972124646989813
##      -e (tolerance error)         1E-05
##      -p (number of processes)      1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
## Main algorithm:
##   [
##   =====
## Number of iterations: 36
##
## Least-square error: 1493315.131308
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"

```

```

## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)           26371
##      -K (number of ancestral pops) 6
##      -x (genotype file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      - diploid
##
## Cross-Entropy (all data): 0.117745
## Cross-Entropy (masked data): 0.120423
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 7  repetition 2      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)           26371
##      -K (number of ancestral pops) 7
##      -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -i (number max of iterations) 200
##      -a (regularization parameter) 10
##      -s (seed random init)        13835854243612483573
##      -e (tolerance error)         1E-05
##      -p (number of processes)     1
##      - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 40
##
## Least-square error: 1467810.690657
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"

```

```

## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   7
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):    0.112999
## Cross-Entropy (masked data): 0.116029
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 8  repetition 2      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   8
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4611361005545086965
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu...
##
##
## Main algorithm:
##   [
##   =====
## Number of iterations: 200
##
## Least-square error: 1437431.667552
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
```

```

## [1] "*****"
## [1] "*   cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)    8
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):    0.110974
## Cross-Entropy (masked data): 0.113876
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 9  repetition 2      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)    9
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)   200
##          -a (regularization parameter)   10
##          -s (seed random init)         4606408998447112181
##          -e (tolerance error)          1E-05
##          -p (number of processes)       1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu...
##
##
## Main algorithm:
##   [
##   =====]
] ## Number of iterations: 22
##
## Least-square error: 1413320.592933
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...

```

```

## 
## [1] "*****"
## [1] "*   cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  9
##           -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           - diploid
##
## Cross-Entropy (all data):  0.10714
## Cross-Entropy (masked data):  0.110361
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 10  repetition 2      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  10
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -i (number max of iterations)  200
##           -a (regularization parameter) 10
##           -s (seed random init)        4651972124646989813
##           -e (tolerance error)         1E-05
##           -p (number of processes)     1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
## 
## Main algorithm:
##   [
##   =====]
## Number of iterations: 78
##
## Least-square error: 1396727.474871
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...

```

```

## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m
## 
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops) 10
##           -x (genotype file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           -q (individual admixture)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           -g (ancestral frequencies)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           -i (with masked genotypes) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           - diploid
##
## Cross-Entropy (all data):    0.105582
## Cross-Entropy (masked data): 0.10872
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 11  repetition 2      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops) 11
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##           -i (number max of iterations) 200
##           -a (regularization parameter) 10
##           -s (seed random init)        4651972124646989813
##           -e (tolerance error)         1E-05
##           -p (number of processes)     1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m
## 
## Main algorithm:
##   [
##   =====
## Number of iterations: 29
##
## Least-square error: 1370178.481947

```

```

## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops) 11
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data): 0.10239
## Cross-Entropy (masked data): 0.10575
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 12 repetition 2      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops) 12
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations) 200
##          -a (regularization parameter) 10
##          -s (seed random init)        4472856565
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
## 
## Main algorithm:
## [
## [=====]
## Number of iterations: 100
##

```

```

## Least-square error: 1350705.797025
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)   12
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):  0.100585
## Cross-Entropy (masked data): 0.104091
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 13 repetition 2      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)   13
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4472856565
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
## 
## Main algorithm:
## [
## [=====]
## Number of iterations: 55

```

```

## 
## Least-square error: 1338342.369808
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
## 
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops) 13
##          -x (genotype file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
## 
## Cross-Entropy (all data):    0.0994781
## Cross-Entropy (masked data): 0.103178
## The project is saved into :
##   892657863_genotypes.snmfProject
## 
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
## 
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
## 
## [1] "*****"
## [1] "* sNMF K = 14 repetition 2      *"
## [1] "*****"
## summary of the options:
## 
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops) 14
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations) 200
##          -a (regularization parameter) 10
##          -s (seed random init)        4472856565
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
## 
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
## 
## Main algorithm:
##   [
##   [=====]

```

```

## Number of iterations: 158
##
## Least-square error: 1320543.823939
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   14
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):    0.0968609
## Cross-Entropy (masked data): 0.100737
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 15  repetition 2      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   15
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4651972124646989813
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
## Main algorithm:
## [

```

```

## [=====]
## Number of iterations: 125
##
## Least-square error: 1301645.727230
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)   15
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):    0.0954262
## Cross-Entropy (masked data):  0.0994003
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 16  repetition 2      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)   16
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4651972124646989813
##          -e (tolerance error)         1E-05
##          -p (number of processes)      1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
## Main algorithm:

```

```

## [
## [=====
## Number of iterations: 78
##
## Least-square error: 1286606.903086
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)   16
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):      0.0937327
## Cross-Entropy (masked data):   0.0978839
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 17 repetition 2      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)   17
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4604629670805790709
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
##

```

```

## Main algorithm:
## [
## [=====]
## Number of iterations: 21
##
## Least-square error: 1277658.137649
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops) 17
##          -x (genotype file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):     0.0932138
## Cross-Entropy (masked data):  0.0974611
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 18  repetition 2      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops) 18
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations) 200
##          -a (regularization parameter) 10
##          -s (seed random init)        13836244694794395637
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenome_multienvi/output_m...
## 
```

```

## 
## Main algorithm:
## [ ] 
## [=====]
## Number of iterations: 33
##
## Least-square error: 1256397.894701
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops) 18
##          -x (genotype file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):    0.0906246
## Cross-Entropy (masked data): 0.0951233
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 19  repetition 2      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops) 19
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations) 200
##          -a (regularization parameter) 10
##          -s (seed random init)        140376888991733
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...

```

```

## 
## Main algorithm:
## [
## [=====]
## Number of iterations: 45
##
## Least-square error: 1244288.114616
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops) 19
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase
##          -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase
##          -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase
##          -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase
##          - diploid
##
## Cross-Entropy (all data):      0.0894297
## Cross-Entropy (masked data):  0.0941465
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 20 repetition 2      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops) 20
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase
##          -i (number max of iterations) 200
##          -a (regularization parameter) 10
##          -s (seed random init)        4602194840960786421
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##

```

```

## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_multienvi.R
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 50
##
## Least-square error: 1234697.343706
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi.R
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi.R
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)            26371
##      -K (number of ancestral pops)  20
##      -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi.R
##      -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi.R
##      -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi.R
##      -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi.R
##      - diploid
##
## Cross-Entropy (all data):      0.08883
## Cross-Entropy (masked data):  0.0936954
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] 1278936786
## [1] "*****"
## [1] "*          create.dataset      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)            26371
##      -s (seed random init)        1278936786
##      -r (percentage of masked data) 0.05
##      -x (genotype file in .geno format) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi.R
##      -o (output file in .geno format) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi.R
##
## Write genotype file with masked data, /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi.R
##
## [1] "*****"
## [1] "* sNMF K = 1  repetition 3      *"

```

```

## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)          1000
##      -L (number of loci)                26371
##      -K (number of ancestral pops)      1
##      -x (input file)                  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##      -q (individual admixture file)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##      -g (ancestral frequencies file)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##      -i (number max of iterations)    200
##      -a (regularization parameter)    10
##      -s (seed random init)           4604726166937077458
##      -e (tolerance error)            1E-05
##      -p (number of processes)         1
##      - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu
##
##
## Main algorithm:
##
## Least-square error: 1810795.063244
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)          1000
##      -L (number of loci)                26371
##      -K (number of ancestral pops)      1
##      -x (genotype file)                /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##      -q (individual admixture)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##      -g (ancestral frequencies)        /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##      -i (with masked genotypes)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##      - diploid
##
## Cross-Entropy (all data):      0.164793
## Cross-Entropy (masked data):  0.166592
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 2 repetition 3      *"
## [1] "*****"
## summary of the options:

```

```

##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   2
##          -x (input file)               /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -i (number max of iterations)    200
##          -a (regularization parameter)   10
##          -s (seed random init)         4595385235838535378
##          -e (tolerance error)           1E-05
##          -p (number of processes)       1
##          - diploid

## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu
## 
## 
## Main algorithm:
## [                                     ]
## [=====]
## Number of iterations: 46
##
## Least-square error: 1682125.924860
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   2
##          -x (genotype file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          - diploid

## Cross-Entropy (all data):      0.147901
## Cross-Entropy (masked data):  0.150061
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 3  repetition 3      *"
## [1] "*****"

```

```

## summary of the options:
##
##      -n (number of individuals)          1000
##      -L (number of loci)                 26371
##      -K (number of ancestral pops)       3
##      -x (input file)                   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##      -q (individual admixture file)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##      -g (ancestral frequencies file)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##      -i (number max of iterations)     200
##      -a (regularization parameter)    10
##      -s (seed random init)           4593401965970130642
##      -e (tolerance error)            1E-05
##      -p (number of processes)         1
##      - diploid

##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mul
##
##
## Main algorithm:
##  [
##  =====
## Number of iterations: 26
##
## Least-square error: 1601800.812887
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)          1000
##      -L (number of loci)                 26371
##      -K (number of ancestral pops)       3
##      -x (genotype file)                  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##      -q (individual admixture)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##      -g (ancestral frequencies)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##      -i (with masked genotypes)        /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##      - diploid

##
## Cross-Entropy (all data):      0.132516
## Cross-Entropy (masked data):  0.13488
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
##  project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##  remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 4  repetition 3      *"

```

```

## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)          1000
##      -L (number of loci)                26371
##      -K (number of ancestral pops)      4
##      -x (input file)                  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##      -q (individual admixture file)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##      -g (ancestral frequencies file)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##      -i (number max of iterations)    200
##      -a (regularization parameter)    10
##      -s (seed random init)           4583185497198364370
##      -e (tolerance error)            1E-05
##      -p (number of processes)         1
##      - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu
##
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 56
##
## Least-square error: 1562293.357666
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)          1000
##      -L (number of loci)                26371
##      -K (number of ancestral pops)      4
##      -x (genotype file)                /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##      -q (individual admixture)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##      -g (ancestral frequencies)        /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##      -i (with masked genotypes)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##      - diploid
##
## Cross-Entropy (all data): 0.126432
## Cross-Entropy (masked data): 0.129023
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"

```

```

## [1] "* sNMF K = 5 repetition 3      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   5
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -i (number max of iterations)    200
##          -a (regularization parameter)   10
##          -s (seed random init)         5573904082
##          -e (tolerance error)          1E-05
##          -p (number of processes)       1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu-
## 
## 
## Main algorithm:
## [
## [=====]
## Number of iterations: 63
##
## Least-square error: 1528072.269654
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
## 
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   5
##          -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          - diploid
##
## Cross-Entropy (all data):      0.121315
## Cross-Entropy (masked data):  0.124121
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
##  project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##  remove.snmfProject("892657863_genotypes.snmfProject")
##

```

```

## [1] "*****"
## [1] "* sNMF K = 6 repetition 3      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)   6
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -i (number max of iterations)    200
##           -a (regularization parameter)   10
##           -s (seed random init)         4572995111762986706
##           -e (tolerance error)          1E-05
##           -p (number of processes)       1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mul
##
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 31
##
## Least-square error: 1492325.082491
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)   6
##           -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           -g (ancestral frequencies)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           - diploid
##
## Cross-Entropy (all data):    0.11772
## Cross-Entropy (masked data): 0.120571
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")

```

```

## 
## [1] "*****"
## [1] "* sNMF K = 7 repetition 3      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)   7
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -i (number max of iterations)    200
##           -a (regularization parameter)   10
##           -s (seed random init)          4651972125748037330
##           -e (tolerance error)           1E-05
##           -p (number of processes)        1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu-
## 
## 
## Main algorithm:
## [ ] 
## [=====]
## Number of iterations: 38
## 
## Least-square error: 1457857.336449
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mu-
## 
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)   7
##           -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           - diploid
##
## Cross-Entropy (all data):      0.112667
## Cross-Entropy (masked data):   0.11574
## The project is saved into :
##   892657863_genotypes.snmfProject
## 
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
## 
## To remove the project, use:

```

```

## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 8 repetition 3      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   8
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4618857979435484882
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu
##
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 41
##
## Least-square error: 1435261.068964
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m
##
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   8
##          -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -q (individual admixture)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          - diploid
##
## Cross-Entropy (all data): 0.110079
## Cross-Entropy (masked data): 0.113398
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##

```

```

## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 9  repetition 3      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)    9
##           -x (input file)                /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -i (number max of iterations)    200
##           -a (regularization parameter)    10
##           -s (seed random init)          4599872295546848978
##           -e (tolerance error)           1E-05
##           -p (number of processes)        1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu...
##
##
## Main algorithm:
##   [
##   [=====]
## Number of iterations: 26
##
## Least-square error: 1412336.096188
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)    9
##           -x (genotype file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           - diploid
##
## Cross-Entropy (all data):    0.106806
## Cross-Entropy (masked data): 0.110312
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")

```

```

## 
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 10 repetition 3      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops) 10
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -i (number max of iterations)  200
##           -a (regularization parameter) 10
##           -s (seed random init)        4651972125748037330
##           -e (tolerance error)         1E-05
##           -p (number of processes)     1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mul-
## 
## 
## Main algorithm:
##   [
##   =====
## Number of iterations: 35
##
## Least-square error: 1391703.357110
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops) 10
##           -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -i (with masked genotypes)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           - diploid
##
## Cross-Entropy (all data):  0.105382
## Cross-Entropy (masked data): 0.109068
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:

```

```

## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 11 repetition 3      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops) 11
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -i (number max of iterations)   200
##          -a (regularization parameter)  10
##          -s (seed random init)        13844147659058382546
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mul-
## 
## Main algorithm:
## [
## =====
## Number of iterations: 43
##
## Least-square error: 1375191.874724
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
## 
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops) 11
##          -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -g (ancestral frequencies)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          - diploid
##
## Cross-Entropy (all data):      0.102942
## Cross-Entropy (masked data):  0.106739
## The project is saved into :
## 892657863_genotypes.snmfProject
##

```

```

## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 12  repetition 3      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops) 12
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##           -i (number max of iterations) 200
##           -a (regularization parameter) 10
##           -s (seed random init)        5573904082
##           -e (tolerance error)         1E-05
##           -p (number of processes)     1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu
##
##
## Main algorithm:
##   [
##   [=====]
## Number of iterations: 54
##
## Least-square error: 1349831.019087
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m
##
## [1] "*****"
## [1] "*    cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops) 12
##           -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           -g (ancestral frequencies)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           - diploid
##
## Cross-Entropy (all data):      0.100554
## Cross-Entropy (masked data):  0.104548
## The project is saved into :
##   892657863_genotypes.snmfProject

```

```

## 
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 13 repetition 3      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  13
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -i (number max of iterations)   200
##           -a (regularization parameter)  10
##           -s (seed random init)        4578251073696499410
##           -e (tolerance error)         1E-05
##           -p (number of processes)     1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mul-
## 
## 
## Main algorithm:
##   [
##   [=====]
## Number of iterations: 20
##
## Least-square error: 1339091.984765
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "*    cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  13
##           -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           - diploid
##
## Cross-Entropy (all data):    0.0992043
## Cross-Entropy (masked data):  0.103275
## The project is saved into :

```

```

## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 14 repetition 3      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  14
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        5573904082
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 85
##
## Least-square error: 1326317.263511
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  14
##          -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):  0.0974611
## Cross-Entropy (masked data): 0.101611

```

```

## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 15 repetition 3      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  15
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -i (number max of iterations) 200
##          -a (regularization parameter) 10
##          -s (seed random init)        13842197086776002258
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu-
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 31
##
## Least-square error: 1299391.991106
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mu-
##
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  15
##          -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -q (individual admixture)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          - diploid
##
## Cross-Entropy (all data):      0.0949611

```

```

## Cross-Entropy (masked data):  0.0992095
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 16  repetition 3      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  16
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -i (number max of iterations)  200
##           -a (regularization parameter) 10
##           -s (seed random init)        140377990039250
##           -e (tolerance error)         1E-05
##           -p (number of processes)     1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenotype_multienvi/output_mu...
##
##
## Main algorithm:
##   [
##   =====]
## Number of iterations: 67
##
## Least-square error: 1290460.103833
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  16
##           -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           - diploid
##

```

```

## Cross-Entropy (all data):      0.0937661
## Cross-Entropy (masked data):  0.0981367
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 17  repetition 3      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  17
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -i (number max of iterations)   200
##           -a (regularization parameter) 10
##           -s (seed random init)        4620393451718641362
##           -e (tolerance error)         1E-05
##           -p (number of processes)     1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu-
## 
## Main algorithm:
##   [
##   =====
## Number of iterations: 44
##
## Least-square error: 1274118.230303
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  17
##           -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           - diploid

```

```

##
## Cross-Entropy (all data):      0.0927518
## Cross-Entropy (masked data):  0.0972772
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 18  repetition 3      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  18
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -i (number max of iterations)   200
##           -a (regularization parameter)  10
##           -s (seed random init)        4592346756930012882
##           -e (tolerance error)          1E-05
##           -p (number of processes)     1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu-
##
##
## Main algorithm:
##   [
##   =====
## Number of iterations: 59
##
## Least-square error: 1260770.351896
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  18
##           -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-

```

```

##      - diploid
##
## Cross-Entropy (all data):    0.0909142
## Cross-Entropy (masked data): 0.0957794
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 19  repetition 3      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)          1000
##      -L (number of loci)                 26371
##      -K (number of ancestral pops)       19
##      -x (input file)                   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##      -q (individual admixture file)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##      -g (ancestral frequencies file)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##      -i (number max of iterations)      200
##      -a (regularization parameter)     10
##      -s (seed random init)            4598871821569951442
##      -e (tolerance error)             1E-05
##      -p (number of processes)         1
##      - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu-
##
##
## Main algorithm:
##   [
##   =====
## Number of iterations: 33
##
## Least-square error: 1246016.275889
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)          1000
##      -L (number of loci)                 26371
##      -K (number of ancestral pops)       19
##      -x (genotype file)                  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##      -q (individual admixture)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##      -g (ancestral frequencies)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
```

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##          -i (with masked genotypes)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno
##          - diploid
##
## Cross-Entropy (all data):    0.0899132
## Cross-Entropy (masked data): 0.0949633
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 20  repetition 3      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  20
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno
##          -i (number max of iterations)   200
##          -a (regularization parameter)  10
##          -s (seed random init)        4592294401278674642
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno_multienvi/output_multienvi
##
## Main algorithm:
##   [
##   =====]
## Number of iterations: 57
##
## Least-square error: 1233747.673545
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno
##
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  20
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno
##          -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno

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##          -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):    0.0886781
## Cross-Entropy (masked data): 0.0937542
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] 1076185179
## [1] "*****"
## [1] "*           create.dataset           *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -s (seed random init)        1076185179
##          -r (percentage of masked data) 0.05
##          -x (genotype file in .geno format) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/
##          -o (output file in .geno format) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/
##
## Write genotype file with masked data, /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphen...
##
## [1] "*****"
## [1] "* sNMF K = 1  repetition 4      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  1
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4505797663859755099
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno_multienvi/output_m...
##
## Main algorithm:
##
## Least-square error: 1811096.869205

```

```

## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  1
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):      0.164873
## Cross-Entropy (masked data):  0.16504
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 2  repetition 4      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  2
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4446054647297558619
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
## 
## Main algorithm:
##   [
##   [=====]
## Number of iterations: 50
## 
```

```

## Least-square error: 1682930.188716
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)  2
##          -x (genotype file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):  0.147952
## Cross-Entropy (masked data): 0.148504
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 3 repetition 4      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)  3
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4600070744308009051
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
## 
## Main algorithm:
## [
## [=====]
## Number of iterations: 30

```

```

## 
## Least-square error: 1602047.605658
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
## 
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)   3
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
## 
## Cross-Entropy (all data): 0.132605
## Cross-Entropy (masked data): 0.133507
## The project is saved into :
##   892657863_genotypes.snmfProject
## 
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
## 
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
## 
## [1] "*****"
## [1] "* sNMF K = 4 repetition 4      *"
## [1] "*****"
## summary of the options:
## 
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)   4
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4536910939527923803
##          -e (tolerance error)         1E-05
##          -p (number of processes)      1
##          - diploid
## 
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
## 
## Main algorithm:
## [
## [=====]

```

```

## Number of iterations: 29
##
## Least-square error: 1564025.588044
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   4
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):    0.126528
## Cross-Entropy (masked data): 0.127696
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 5  repetition 4      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   5
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter)  10
##          -s (seed random init)        4605066551482468443
##          -e (tolerance error)         1E-05
##          -p (number of processes)      1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
## Main algorithm:
## [

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```

## [=====
## Number of iterations: 39
##
## Least-square error: 1531078.268007
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)   5
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data): 0.123455
## Cross-Entropy (masked data): 0.124787
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 6 repetition 4      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)   6
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4521348606567204955
##          -e (tolerance error)         1E-05
##          -p (number of processes)      1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
## Main algorithm:

```

```

## [
## [=====
## Number of iterations: 38
##
## Least-square error: 1496088.877568
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)   6
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):      0.118355
## Cross-Entropy (masked data):   0.119922
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 7 repetition 4      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)   7
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter)  10
##          -s (seed random init)        4519305804157110363
##          -e (tolerance error)         1E-05
##          -p (number of processes)      1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
##

```

```

## Main algorithm:
## [
## [=====
## Number of iterations: 38
##
## Least-square error: 1458790.411464
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)   7
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):      0.112753
## Cross-Entropy (masked data):   0.114606
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 8  repetition 4      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)   8
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter)  10
##          -s (seed random init)        4469502918170855515
##          -e (tolerance error)         1E-05
##          -p (number of processes)      1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##

```

```

## 
## Main algorithm:
## [ ] 
## [=====]
## Number of iterations: 85
## 
## Least-square error: 1436033.359053
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "* cross-entropy estimation *"
## [1] "*****"
## summary of the options:
## 
##      -n (number of individuals)      1000
##      -L (number of loci)           26371
##      -K (number of ancestral pops)   8
##      -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      - diploid
## 
## Cross-Entropy (all data): 0.109426
## Cross-Entropy (masked data): 0.111498
## The project is saved into :
##   892657863_genotypes.snmfProject
## 
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
## 
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
## 
## [1] "*****"
## [1] "* sNMF K = 9  repetition 4      *"
## [1] "*****"
## summary of the options:
## 
##      -n (number of individuals)      1000
##      -L (number of loci)           26371
##      -K (number of ancestral pops)   9
##      -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -i (number max of iterations)  200
##      -a (regularization parameter)  10
##      -s (seed random init)        2657829671984777307
##      -e (tolerance error)          1E-05
##      -p (number of processes)       1
##      - diploid
## 
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...

```

```

## 
## Main algorithm:
## [
## [=====]
## Number of iterations: 68
##
## Least-square error: 1415686.085613
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase.R
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase.R
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  9
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase.R
##          -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase.R
##          -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase.R
##          -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase.R
##          - diploid
##
## Cross-Entropy (all data):      0.107447
## Cross-Entropy (masked data):  0.109654
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 10  repetition 4      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  10
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase.R
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase.R
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphase.R
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4603143857832806491
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##

```

```

## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_multienvi.RData
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 26
##
## Least-square error: 1391891.295281
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/individual_coefficients.RData
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/ancestral_coefficients.RData
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops) 10
##          -x (genotype file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/genotypes.RData
##          -q (individual admixture)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/individual_admixture.RData
##          -g (ancestral frequencies)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/ancestral_frequencies.RData
##          -i (with masked genotypes) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/masked_genotypes.RData
##          - diploid
##
## Cross-Entropy (all data):    0.104178
## Cross-Entropy (masked data): 0.106729
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 11  repetition 4      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops) 11
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/genotypes.RData
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/individual_admixture.RData
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/ancestral_frequencies.RData
##          -i (number max of iterations) 200
##          -a (regularization parameter) 10
##          -s (seed random init)        4604886227280545883
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid

```

```

##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu...
##
##
## Main algorithm:
##   [
##     =====
##   Number of iterations: 27
##
## Least-square error: 1374224.067298
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  11
##           -x (genotype file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           - diploid
##
## Cross-Entropy (all data):      0.103093
## Cross-Entropy (masked data):  0.105678
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 12 repetition 4      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  12
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -i (number max of iterations)  200
##           -a (regularization parameter) 10
##           -s (seed random init)        3879694279389825115
##           -e (tolerance error)         1E-05
##           -p (number of processes)     1

```

```

##      - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mul...
##
##
## Main algorithm:
##  [
##  =====
## Number of iterations: 36
##
## Least-square error: 1351057.905118
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)            26371
##      -K (number of ancestral pops)   12
##      -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      - diploid
##
## Cross-Entropy (all data):    0.100627
## Cross-Entropy (masked data): 0.103412
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
##  project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##  remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 13 repetition 4      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)            26371
##      -K (number of ancestral pops)   13
##      -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -i (number max of iterations)  200
##      -a (regularization parameter)  10
##      -s (seed random init)        4455130570324002907
##      -e (tolerance error)         1E-05

```

```

##          -p (number of processes)           1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mul
##
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 81
##
## Least-square error: 1336158.593046
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops) 13
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -i (with masked genotypes)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          - diploid
##
## Cross-Entropy (all data): 0.0993336
## Cross-Entropy (masked data): 0.102369
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 14 repetition 4      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops) 14
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -i (number max of iterations) 200
##          -a (regularization parameter) 10
##          -s (seed random init)        4603387485557704795

```

```

##          -e (tolerance error)           1E-05
##          -p (number of processes)        1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu
##
##
## Main algorithm:
## [                                     ]
## [=====]
## Number of iterations: 68
##
## Least-square error: 1318561.641777
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m
##
## [1] "*****"
## [1] "*   cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  14
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          - diploid
##
## Cross-Entropy (all data):     0.0971134
## Cross-Entropy (masked data):  0.100278
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 15  repetition 4      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  15
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10

```

```

##          -s (seed random init)          4595689194766288987
##          -e (tolerance error)          1E-05
##          -p (number of processes)        1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu-
## 
## 
## Main algorithm:
## [                                     ]
## [=====]
## Number of iterations: 52
##
## Least-square error: 1303137.042199
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## 
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   15
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          - diploid
##
## Cross-Entropy (all data):      0.095313
## Cross-Entropy (masked data):  0.0986931
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 16  repetition 4      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   16
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -i (number max of iterations)   200

```

```

##          -a (regularization parameter)      10
##          -s (seed random init)           4424405508159785051
##          -e (tolerance error)            1E-05
##          -p (number of processes)        1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu
##
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 72
##
## Least-square error: 1285705.918204
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/i
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)             26371
##          -K (number of ancestral pops)   16
##          -x (genotype file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##          - diploid
##
## Cross-Entropy (all data):    0.0934731
## Cross-Entropy (masked data): 0.0969515
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 17 repetition 4      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)             26371
##          -K (number of ancestral pops)   17
##          -x (input file)                /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul

```

```

##          -i (number max of iterations)      200
##          -a (regularization parameter)      10
##          -s (seed random init)            4565163367544997979
##          -e (tolerance error)             1E-05
##          -p (number of processes)         1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu...
## 
## 
## Main algorithm:
## [
## [=====]
## Number of iterations: 37
##
## Least-square error: 1276467.608358
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)  17
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):      0.0923962
## Cross-Entropy (masked data):  0.0961524
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 18  repetition 4      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)           26371
##          -K (number of ancestral pops)  18
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...

```

```

## -g (ancestral frequencies file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -i (number max of iterations)           200
## -a (regularization parameter)          10
## -s (seed random init)                 4560345174448097371
## -e (tolerance error)                  1E-05
## -p (number of processes)              1
## - diploid

##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
## 
## 
## Main algorithm:
## [                                     ]
## [=====]
## Number of iterations: 77
## 
## Least-square error: 1262598.529900
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
## 
## -n (number of individuals)          1000
## -L (number of loci)                26371
## -K (number of ancestral pops)     18
## -x (genotype file)                /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -q (individual admixture)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -g (ancestral frequencies)        /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -i (with masked genotypes)        /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## - diploid

##
## Cross-Entropy (all data):    0.0911284
## Cross-Entropy (masked data): 0.0951153
## The project is saved into :
##   892657863_genotypes.snmfProject
## 
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
## 
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
## 
## [1] "*****"
## [1] "* sNMF K = 19 repetition 4      *"
## [1] "*****"
## summary of the options:
## 
## -n (number of individuals)          1000
## -L (number of loci)                26371
## -K (number of ancestral pops)     19
## -x (input file)                  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...

```

```

## -q (individual admixture file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -g (ancestral frequencies file)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -i (number max of iterations)           200
## -a (regularization parameter)          10
## -s (seed random init)                 4289958403136374875
## -e (tolerance error)                  1E-05
## -p (number of processes)               1
## - diploid

##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu...
## 
## 
## Main algorithm:
## [                                     ]
## [=====]
## Number of iterations: 72
##
## Least-square error: 1249528.909383
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
## -n (number of individuals)          1000
## -L (number of loci)                26371
## -K (number of ancestral pops)       19
## -x (genotype file)                 /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -q (individual admixture)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -g (ancestral frequencies)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -i (with masked genotypes)        /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## - diploid

##
## Cross-Entropy (all data):    0.0900459
## Cross-Entropy (masked data):  0.0942306
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 20  repetition 4      *"
## [1] "*****"
## summary of the options:
##
## -n (number of individuals)          1000
## -L (number of loci)                26371
## -K (number of ancestral pops)       20

```

```

## -x (input file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -i (number max of iterations) 200
## -a (regularization parameter) 10
## -s (seed random init) 4194549887953881179
## -e (tolerance error) 1E-05
## -p (number of processes) 1
## - diploid

## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mul...
## 
## 

## Main algorithm:
## [ ] 
## [=====]
## Number of iterations: 33
## 
## Least-square error: 1232316.663853
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
## 
## -n (number of individuals) 1000
## -L (number of loci) 26371
## -K (number of ancestral pops) 20
## -x (genotype file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -q (individual admixture) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -g (ancestral frequencies) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -i (with masked genotypes) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## - diploid

## Cross-Entropy (all data): 0.0881269
## Cross-Entropy (masked data): 0.0924448
## The project is saved into :
## 892657863_genotypes.snmfProject
## 
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
## 
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
## 
## [1] 1703111606
## [1] "*****"
## [1] "*      create.dataset      *"
## [1] "*****"
## summary of the options:
## 
## -n (number of individuals) 1000

```

```

## -L (number of loci) 26371
## -s (seed random init) 1703111606
## -r (percentage of masked data) 0.05
## -x (genotype file in .geno format) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/
## -o (output file in .geno format) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/
##
## Write genotype file with masked data, /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomasked.geno
##
## [1] "*****"
## [1] "* sNMF K = 1 repetition 5      *"
## [1] "*****"
## summary of the options:
##
## -n (number of individuals) 1000
## -L (number of loci) 26371
## -K (number of ancestral pops) 1
## -x (input file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomasked.geno
## -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomasked.geno
## -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomasked.geno
## -i (number max of iterations) 200
## -a (regularization parameter) 10
## -s (seed random init) 4606879625308761014
## -e (tolerance error) 1E-05
## -p (number of processes) 1
## - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomasked.geno
##
## Main algorithm:
##
## Least-square error: 1810581.833197
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomasked.ind.pop
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomasked.pop.freq
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
## -n (number of individuals) 1000
## -L (number of loci) 26371
## -K (number of ancestral pops) 1
## -x (genotype file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomasked.geno
## -q (individual admixture) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomasked.geno
## -g (ancestral frequencies) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomasked.geno
## -i (with masked genotypes) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomasked.geno
## - diploid
##
## Cross-Entropy (all data): 0.164782
## Cross-Entropy (masked data): 0.166772
## The project is saved into :
## 892657863_genotypes.snmfProject
##

```

```

## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 2  repetition 5      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  2
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul
##           -i (number max of iterations)  200
##           -a (regularization parameter) 10
##           -s (seed random init)        4386833083341695926
##           -e (tolerance error)         1E-05
##           -p (number of processes)     1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu
##
##
## Main algorithm:
##   [
##   =====
## Number of iterations: 39
##
## Least-square error: 1682548.963814
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m
##
## [1] "*****"
## [1] "*    cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  2
##           -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           -q (individual admixture)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           -g (ancestral frequencies)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##           - diploid
##
## Cross-Entropy (all data):      0.147898
## Cross-Entropy (masked data):  0.150162
## The project is saved into :
##   892657863_genotypes.snmfProject

```

```

## 
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 3 repetition 5      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  3
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -i (number max of iterations)   200
##           -a (regularization parameter)  10
##           -s (seed random init)        4573248059991092150
##           -e (tolerance error)         1E-05
##           -p (number of processes)     1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mul-
##
## 
## Main algorithm:
##   [
##   [=====]
## Number of iterations: 22
##
## Least-square error: 1601613.430844
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "*    cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  3
##           -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -i (with masked genotypes)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           - diploid
##
## Cross-Entropy (all data):    0.132516
## Cross-Entropy (masked data): 0.134796
## The project is saved into :

```

```

## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 4 repetition 5      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   4
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -i (number max of iterations)    200
##          -a (regularization parameter)   10
##          -s (seed random init)         4530635430294678454
##          -e (tolerance error)           1E-05
##          -p (number of processes)       1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mul-
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 17
##
## Least-square error: 1562516.727893
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   4
##          -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          - diploid
##
## Cross-Entropy (all data):  0.126451
## Cross-Entropy (masked data): 0.128852

```

```

## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 5 repetition 5      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  5
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##          -i (number max of iterations) 200
##          -a (regularization parameter) 10
##          -s (seed random init)        4575095157921377206
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu-
## 
## Main algorithm:
## [
## =====
## Number of iterations: 48
## 
## Least-square error: 1527278.139558
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mu-
## 
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  5
##          -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -q (individual admixture)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##          - diploid
##
## Cross-Entropy (all data):      0.12117

```

```

## Cross-Entropy (masked data):  0.123793
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 6  repetition 5      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)    6
##           -x (input file)               /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##           -i (number max of iterations)    200
##           -a (regularization parameter)    10
##           -s (seed random init)          4499486695376513974
##           -e (tolerance error)           1E-05
##           -p (number of processes)        1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenotype_multienvi/output_mu...
##
##
## Main algorithm:
##   [
##   =====]
## Number of iterations: 54
##
## Least-square error: 1490468.571909
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)    6
##           -x (genotype file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##           - diploid
##

```

```

## Cross-Entropy (all data):      0.115562
## Cross-Entropy (masked data):  0.118239
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 7 repetition 5      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  7
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -i (number max of iterations)   200
##           -a (regularization parameter) 10
##           -s (seed random init)        4495597615374887862
##           -e (tolerance error)         1E-05
##           -p (number of processes)     1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu-
## 
## Main algorithm:
##   [
##   =====
## Number of iterations: 43
##
## Least-square error: 1458798.702387
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  7
##           -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -i (with masked genotypes)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           - diploid

```

```

## Cross-Entropy (all data):      0.112712
## Cross-Entropy (masked data):  0.115485
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 8  repetition 5      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  8
##           -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##           -i (number max of iterations)   200
##           -a (regularization parameter)  10
##           -s (seed random init)        4601606457736260534
##           -e (tolerance error)         1E-05
##           -p (number of processes)     1
##           - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu-
## 
## Main algorithm:
##   [
##   =====
## Number of iterations: 39
##
## Least-square error: 1436278.479710
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## 
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##           -n (number of individuals)      1000
##           -L (number of loci)            26371
##           -K (number of ancestral pops)  8
##           -x (genotype file)             /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -q (individual admixture)       /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##           -i (with masked genotypes)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-

```

```

##      - diploid
##
## Cross-Entropy (all data):    0.109366
## Cross-Entropy (masked data): 0.112299
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 9  repetition 5      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)          1000
##      -L (number of loci)                 26371
##      -K (number of ancestral pops)       9
##      -x (input file)                   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##      -q (individual admixture file)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##      -g (ancestral frequencies file)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##      -i (number max of iterations)      200
##      -a (regularization parameter)     10
##      -s (seed random init)            4606354483952446390
##      -e (tolerance error)             1E-05
##      -p (number of processes)         1
##      - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu-
##
##
## Main algorithm:
##   [
##   =====
## Number of iterations: 45
##
## Least-square error: 1413652.354846
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul-
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)          1000
##      -L (number of loci)                 26371
##      -K (number of ancestral pops)       9
##      -x (genotype file)                  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##      -q (individual admixture)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-
##      -g (ancestral frequencies)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe-

```

```

##          -i (with masked genotypes)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno
##          - diploid
##
## Cross-Entropy (all data):    0.106863
## Cross-Entropy (masked data): 0.110003
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 10  repetition 5      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  10
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno
##          -i (number max of iterations)   200
##          -a (regularization parameter)  10
##          -s (seed random init)        4518557724560288694
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno_multienvi/output_multienvi
##
## Main algorithm:
##   [
##   =====
## Number of iterations: 38
##
## Least-square error: 1391688.441900
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno
##
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  10
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno
##          -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multipheno

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##          -g (ancestral frequencies)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)      /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):      0.105385
## Cross-Entropy (masked data):   0.108688
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 11 repetition 5      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  11
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4488150528630680502
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
##
## Main algorithm:
##   [
##   =====]
## Number of iterations: 35
##
## Least-square error: 1371519.578538
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)  11
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...

```

```

## -q (individual admixture)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -g (ancestral frequencies)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -i (with masked genotypes)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## - diploid

##
## Cross-Entropy (all data):      0.103082
## Cross-Entropy (masked data):   0.106473
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 12  repetition 5      *"
## [1] "*****"
## summary of the options:
##
##       -n (number of individuals)           1000
##       -L (number of loci)                 26371
##       -K (number of ancestral pops)       12
##       -x (input file)                   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##       -q (individual admixture file)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##       -g (ancestral frequencies file)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##       -i (number max of iterations)     200
##       -a (regularization parameter)     10
##       -s (seed random init)           4453564342406966198
##       -e (tolerance error)            1E-05
##       -p (number of processes)         1
##       - diploid

##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
##
## Main algorithm:
##   [
##   =====
## Number of iterations: 46
##
## Least-square error: 1359772.626327
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##       -n (number of individuals)           1000
##       -L (number of loci)                 26371
##       -K (number of ancestral pops)       12

```

```

##      -x (genotype file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -q (individual admixture)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -g (ancestral frequencies)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -i (with masked genotypes) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      - diploid                  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##
## Cross-Entropy (all data):    0.101386
## Cross-Entropy (masked data): 0.105008
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 13  repetition 5      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)            26371
##      -K (number of ancestral pops) 13
##      -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -i (number max of iterations) 200
##      -a (regularization parameter) 10
##      -s (seed random init)        4588144930718968758
##      -e (tolerance error)         1E-05
##      -p (number of processes)     1
##      - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_mu...
##
##
## Main algorithm:
##  [
##  =====]
## Number of iterations: 39
##
## Least-square error: 1337286.162273
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)            26371

```

```

##          -K (number of ancestral pops)      13
##          -x (genotype file)                  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)         /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):      0.0988722
## Cross-Entropy (masked data):   0.10268
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 14  repetition 5      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)             26371
##          -K (number of ancestral pops)  14
##          -x (input file)                /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4537526323069021110
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
##
## Main algorithm:
##   [
##   =====
## Number of iterations: 24
##
## Least-square error: 1317053.114127
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "*   cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000

```

```

##          -L (number of loci)          26371
##          -K (number of ancestral pops) 14
##          -x (genotype file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):      0.096934
## Cross-Entropy (masked data):  0.10092
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 15  repetition 5      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops) 15
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations) 200
##          -a (regularization parameter) 10
##          -s (seed random init)        4369655039518796726
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
##
## Main algorithm:
##  [
##  =====
## Number of iterations: 134
##
## Least-square error: 1306511.210374
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##

```

```

##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   15
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data):      0.0958263
## Cross-Entropy (masked data):  0.0998722
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 16  repetition 5      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops)   16
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations)  200
##          -a (regularization parameter) 10
##          -s (seed random init)        4367551935767866294
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
## Main algorithm:
##   [
##   =====]
## Number of iterations: 64
##
## Least-square error: 1287104.874203
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"
## summary of the options:

```

```

## -n (number of individuals) 1000
## -L (number of loci) 26371
## -K (number of ancestral pops) 16
## -x (genotype file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -q (individual admixture) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -g (ancestral frequencies) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## -i (with masked genotypes) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## - diploid

## Cross-Entropy (all data): 0.0936979
## Cross-Entropy (masked data): 0.0981126
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 17 repetition 5      *"
## [1] "*****"
## summary of the options:
##
## -n (number of individuals) 1000
## -L (number of loci) 26371
## -K (number of ancestral pops) 17
## -x (input file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
## -i (number max of iterations) 200
## -a (regularization parameter) 10
## -s (seed random init) 4575626234922494902
## -e (tolerance error) 1E-05
## -p (number of processes) 1
## - diploid

## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
##
## Main algorithm:
## [
## =====
## Number of iterations: 91
##
## Least-square error: 1272162.666162
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"
## [1] "*****"

```

```

## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)           26371
##      -K (number of ancestral pops) 17
##      -x (genotype file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -q (individual admixture)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -g (ancestral frequencies)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -i (with masked genotypes)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      - diploid

##
## Cross-Entropy (all data):    0.091982
## Cross-Entropy (masked data): 0.0966283
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 18 repetition 5      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)           26371
##      -K (number of ancestral pops) 18
##      -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -i (number max of iterations) 200
##      -a (regularization parameter) 10
##      -s (seed random init)        4605332264556129206
##      -e (tolerance error)         1E-05
##      -p (number of processes)     1
##      - diploid

##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
##
## Main algorithm:
##   [
##   [=====]
## Number of iterations: 72
##
## Least-square error: 1260866.472548
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"
## [1] "* cross-entropy estimation      *"

```

```

## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)           26371
##      -K (number of ancestral pops) 18
##      -x (genotype file)          /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -q (individual admixture)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -g (ancestral frequencies)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      -i (with masked genotypes)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##      - diploid
##
## Cross-Entropy (all data):    0.0910799
## Cross-Entropy (masked data): 0.0959131
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 19  repetition 5      *"
## [1] "*****"
## summary of the options:
##
##      -n (number of individuals)      1000
##      -L (number of loci)           26371
##      -K (number of ancestral pops) 19
##      -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##      -i (number max of iterations) 200
##      -a (regularization parameter) 10
##      -s (seed random init)        4606760779268713398
##      -e (tolerance error)         1E-05
##      -p (number of processes)     1
##      - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 55
##
## Least-square error: 1245393.914231
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
##
## [1] "*****"

```

```

## [1] "*      cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops) 19
##          -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -q (individual admixture)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -g (ancestral frequencies)   /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          -i (with masked genotypes)  /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
##          - diploid
##
## Cross-Entropy (all data): 0.0895584
## Cross-Entropy (masked data): 0.0944832
## The project is saved into :
## 892657863_genotypes.snmfProject
##
## To load the project, use:
## project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
## remove.snmfProject("892657863_genotypes.snmfProject")
##
## [1] "*****"
## [1] "* sNMF K = 20 repetition 5      *"
## [1] "*****"
## summary of the options:
##
##          -n (number of individuals)      1000
##          -L (number of loci)            26371
##          -K (number of ancestral pops) 20
##          -x (input file)              /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -q (individual admixture file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -g (ancestral frequencies file) /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/mul...
##          -i (number max of iterations) 200
##          -a (regularization parameter) 10
##          -s (seed random init)        4602459927867517878
##          -e (tolerance error)         1E-05
##          -p (number of processes)     1
##          - diploid
##
## Read genotype file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphenomultienvi/output_m...
##
##
## Main algorithm:
## [
## [=====]
## Number of iterations: 26
##
## Least-square error: 1237534.172457
## Write individual ancestry coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe...
## Write ancestral allele frequency coefficient file /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/m...
## 
```

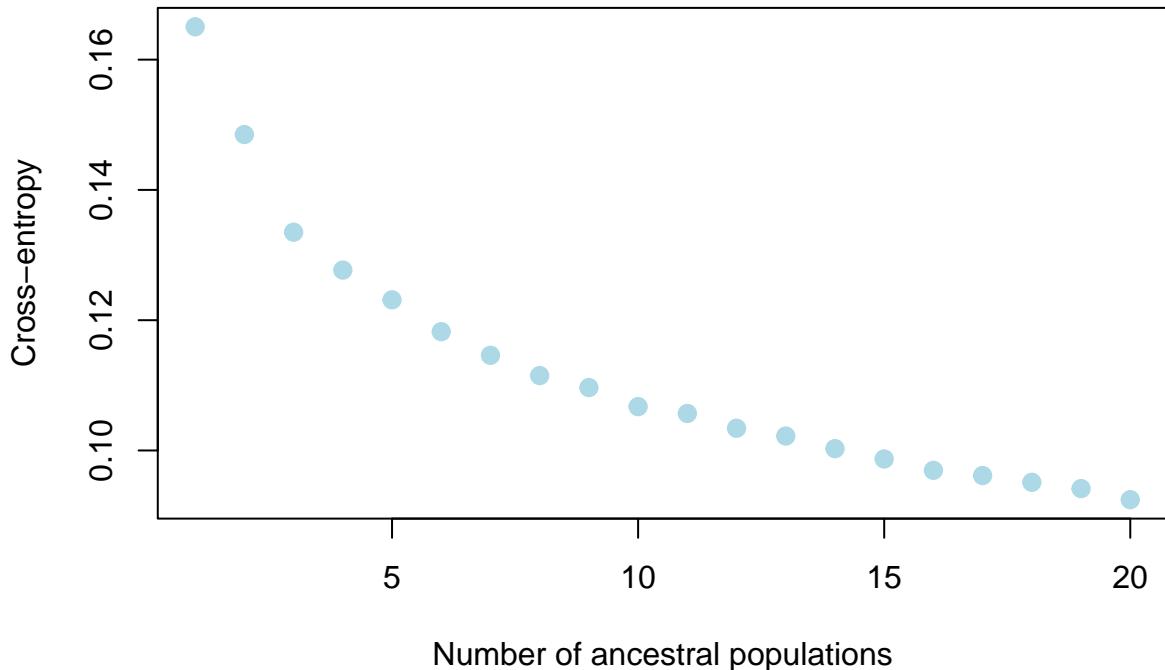
```

## [1] "*****"
## [1] "*   cross-entropy estimation      *"
## [1] "*****"
## summary of the options:
##
##       -n (number of individuals)      1000
##       -L (number of loci)            26371
##       -K (number of ancestral pops)  20
##       -x (genotype file)           /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##       -q (individual admixture)     /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##       -g (ancestral frequencies)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##       -i (with masked genotypes)    /Users/lotterhos/Documents/GitHub/MVP-NonClinalAF/multiphe
##       - diploid
##
## Cross-Entropy (all data): 0.0888243
## Cross-Entropy (masked data): 0.093988
## The project is saved into :
##   892657863_genotypes.snmfProject
##
## To load the project, use:
##   project = load.snmfProject("892657863_genotypes.snmfProject")
##
## To remove the project, use:
##   remove.snmfProject("892657863_genotypes.snmfProject")

# obj.snmf <- load.snmfProject("892657863_genotypes.snmfProject")

# plot cross-entropy criterion
plot(obj.snmf, cex = 1.2, col = "lightblue", pch = 19)

```



```
# select run with lowest cross-entropy
entropy <- cross.entropy(obj.snmf, K = 3)
best <- which.min(entropy)
```

```
# generate Q-matrix
qmatrix <- Q(obj.snmf, K = 3, run = best)
head(qmatrix)
```

```
##          V1          V2          V3
## [1,] 0.12974600 0.000099991 0.87015400
## [2,] 0.99980000 0.000099990 0.00009999
## [3,] 0.15002800 0.785661000 0.06431130
## [4,] 0.04186600 0.170400000 0.78773400
## [5,] 0.00009999 0.000099990 0.99980000
## [6,] 0.00009999 0.004144060 0.99575600
```

```
subset_indPhen_df$Q1 <- qmatrix[,1]
subset_indPhen_df$Q2 <- qmatrix[,2]
subset_indPhen_df$Q3 <- qmatrix[,3]

cluster <- apply(qmatrix, 1, which.max)
subset_indPhen_df$cluster <- cluster
# order qmatrix and individual names by population
qmatrix <- data.frame(qmatrix)
qmatrix$cluster <- cluster
head(qmatrix)
```

```
##          V1          V2          V3 cluster
## 1 0.12974600 0.000099991 0.87015400      3
## 2 0.99980000 0.000099990 0.00009999      1
## 3 0.15002800 0.785661000 0.06431130      2
## 4 0.04186600 0.170400000 0.78773400      3
## 5 0.00009999 0.000099990 0.99980000      3
## 6 0.00009999 0.004144060 0.99575600      3
```

```
qmat.ord <- qmatrix[order(cluster, qmatrix[,1], qmatrix[,2], qmatrix[,3]),]
head(qmat.ord)
```

```
##          V1          V2          V3 cluster
## 668 0.410276 0.241854000 0.347870      1
## 146 0.432005 0.261558000 0.306436      1
## 304 0.452199 0.120928000 0.426873      1
## 166 0.501485 0.000099991 0.498415      1
## 216 0.502600 0.000099991 0.497300      1
## 929 0.515463 0.000099991 0.484437      1
```

```
qmat.ord <- qmat.ord[,c(3,2,1,4)]
```

```
pdf("Ancestry_barplot.pdf", width=11, height=5)
par(mar=c(1,4,2,1))
# generate plot
```

```

ancestry <- barplot(t(qmat.ord[,1:3]), col=c("lightblue", "orange", "darkblue"), border = NA, space = 0, yaxt="none")

cexsize <- 0.5
# Plot the first cluster
xl <- which(qmat.ord$cluster==1)
points(x=xl, y=rep(-0.1,length(xl)),
       col="darkblue",
       pch=19, cex=cexsize)
points(x=xl, y=rep(-0.1,length(xl)),
       col=unlist(lapply(qmat.ord[xl,2],function(x){adjustcolor("orange", x)})),
       pch=19, cex=cexsize, lwd=0)
points(x=xl, y=rep(-0.1,length(xl)),
       col=unlist(lapply(qmat.ord[xl,1],function(x){adjustcolor("lightblue", x)})),
       pch=19, cex=cexsize , lwd=0)

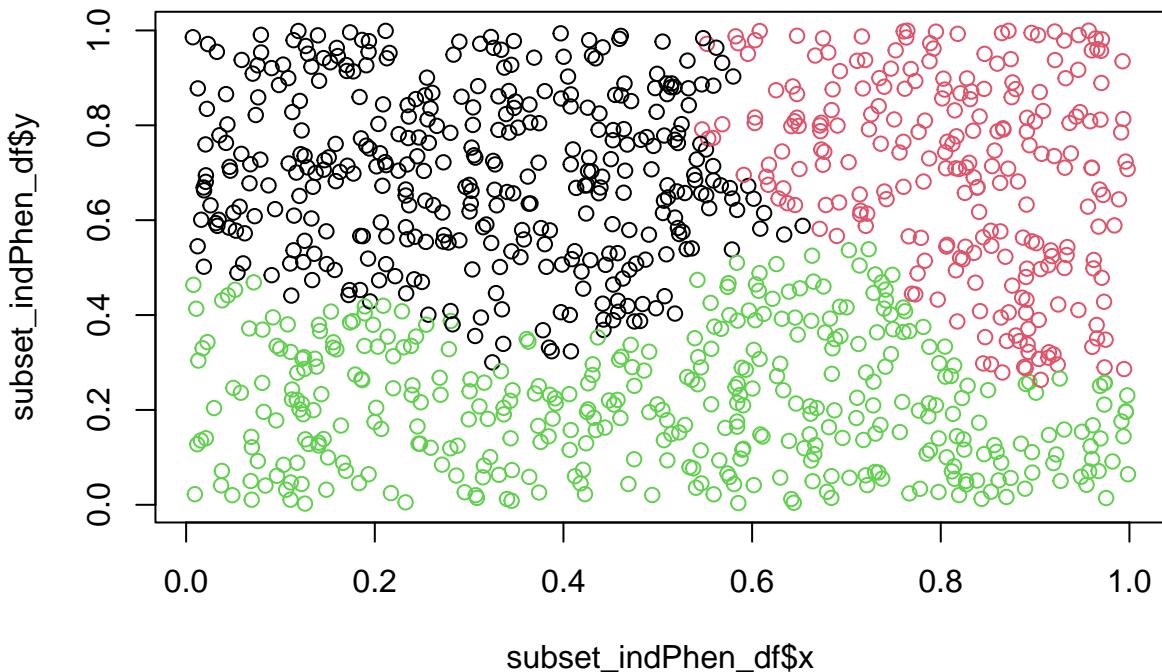
# plot the second cluster
xl <- which(qmat.ord$cluster==2)
points(x=xl, y=rep(-0.1,length(xl)),
       col="orange",
       pch=19, cex=cexsize )
points(x=xl, y=rep(-0.1,length(xl)),
       col=unlist(lapply(qmat.ord[xl,3],function(x){adjustcolor("darkblue", x)})),
       pch=19, cex=cexsize , lwd=0)
points(x=xl, y=rep(-0.1,length(xl)),
       col=unlist(lapply(qmat.ord[xl,1],function(x){adjustcolor("lightblue", x)})),
       pch=19, cex=cexsize, lwd=0)

# plot the third cluster
xl <- which(qmat.ord$cluster==3)
points(x=xl, y=rep(-0.1,length(xl)),
       col="lightblue",
       pch=19, cex=cexsize )
points(x=xl, y=rep(-0.1,length(xl)),
       col=unlist(lapply(qmat.ord[xl,3],function(x){adjustcolor("darkblue", x)})),
       pch=19, cex=cexsize , lwd=0)
points(x=xl, y=rep(-0.1,length(xl)),
       col=unlist(lapply(qmat.ord[xl,2],function(x){adjustcolor("orange", x)})),
       pch=19, cex=cexsize , lwd=0)
dev.off()

## pdf
## 2

plot(subset_indPhen_df$x, subset_indPhen_df$y, col=cluster)

```



```

pdf("AncestryOnMap.pdf", width=7, height=7)

ggplot() +
  #add first cluster
  geom_point(data=subset_indPhen_df [subset_indPhen_df$cluster==1,], aes(x=x, y=y), pch=19, alpha=1, size=5) +
  geom_point(data=subset_indPhen_df [subset_indPhen_df$cluster==1,], aes(x=x, y=y, alpha=round(Q2,1)), size=5) +
  geom_point(data=subset_indPhen_df [subset_indPhen_df$cluster==1,], aes(x=x, y=y, alpha=round(Q3,1)), size=5)

  #add second cluster
  geom_point(data=subset_indPhen_df [subset_indPhen_df$cluster==2,], aes(x=x, y=y), pch=19, size=5, colour="green") +
  geom_point(data=subset_indPhen_df [subset_indPhen_df$cluster==2,], aes(x=x, y=y, alpha=Q1), pch=19, size=5) +
  geom_point(data=subset_indPhen_df [subset_indPhen_df$cluster==2,], aes(x=x, y=y, alpha=Q3), pch=19, size=5)

  #add third cluster
  geom_point(data=subset_indPhen_df [subset_indPhen_df$cluster==3,], aes(x=x, y=y, alpha=1), pch=19, size=5) +
  geom_point(data=subset_indPhen_df [subset_indPhen_df$cluster==3,], aes(x=x, y=y, alpha=Q1), pch=19, size=5) +
  geom_point(data=subset_indPhen_df [subset_indPhen_df$cluster==3,], aes(x=x, y=y, alpha=Q2), pch=19, size=5)

  ggtheme +
  scale_alpha(range = c(0, 1)) +
  theme(legend.position = "none")

  dev.off()

## pdf
## 2

```