

MVA_Project4.R

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```
##### Assignment 6 - Factor Analysis #####
```

```
#Getting working directory  
getwd()
```

```
## [1] "/Users/thindprateek/Desktop/Multivariate Analysis"
```

```
#Setting directory to load dataset  
setwd("/Users/thindprateek/Desktop/Multivariate Analysis")
```

```
#Reading the data into a dataframe  
df <- read.csv(file = 'US_Accidents_June20.csv')
```

```
num <- read.csv(file = 'num.csv')  
# Performing clustering on the first 500 records for now to achieve easy and quick results and test the  
num<-num[1:500,]  
attach(num)  
# Printing first few columns of data set for inference  
#head(df)
```

```
## Setting random seed to shuffle data before splitting  
set.seed(23)
```

```
#Checking number of rows  
#rows<-sample(nrow(df))
```

```
#Shuffling the data  
#mva<-df[rows,]
```

```
#Taking the required number of instances from the shuffled data to reduce any biases  
#mva<-mva[950000:1000000,]
```

```
#Checking the structure of the data set  
#str(mva)
```

```
# Checking the number of rows and columns in the current uncleaned dataset  
#ncol(mva)  
#nrow(mva)
```

```
# Printing all the column names to find and filter the relevant and irrelevant attributes  
#names<-names(mva)
```

```

#names

## DATA CLEANING ##

#Dropping the surplus attributes which do not contribute to the analysis
#mva <- mva[-c(1:3,7:10,13,14,19,21:23,33,47:49)]

#Checking for any null values in the present data set
# is.na(mva[,])

#Checking which rows have all the values filled and complete
# complete.cases(mva)

#Making a new dataframe with only the rows that have complete information and all values filled
#Mva<-na.omit(mva)
#Mva<-Mva[!(is.na(Mva$Sunrise_Sunset) | Mva$Sunrise_Sunset==""), ]
#Mva<- Mva[complete.cases(Mva),]
#Verifying for missing values in the new dataframe
#complete.cases(Mva)
#unique(Mva$Sunrise_Sunset)

# Creating new dataframe with only the numerical attributes to perform statistical functions
#num<-Mva[,c(1,4,11:15,17,18)]
#write.csv(num,"/Users/mihikagupta/Desktop/SEM_2/MVA/num.csv", row.names = FALSE)

# Scaling the new data set for better accuracies
# num<-scale(num)

# Checking the dimensions of the data
nrow(num)

```

```
## [1] 500
```

```
ncol(num)
```

```
## [1] 9
```

```

##### Computing correlation matrix #####
cor.num<-cor(num)
cor.num

```

```

##              Severity Distance.mi. Temperature.F. Wind_Chill.F.
## Severity      1.00000000  0.060325232   -0.026274516   -0.03165259
## Distance.mi.   0.06032523  1.000000000   -0.010229758   -0.01679232
## Temperature.F. -0.02627452 -0.010229758    1.000000000    0.99372259
## Wind_Chill.F.  -0.03165259 -0.016792324    0.993722592    1.00000000
## Humidity...    0.08687654  0.004473866   -0.452662114   -0.43537980
## Pressure.in.   0.06567115 -0.008218439    0.055390478    0.05040739
## Visibility.mi. -0.01784787 -0.041477419    0.256766004    0.26208308
## Wind_Speed.mph. -0.06205678  0.009728557    0.004761887   -0.05069851
## Precipitation.in. 0.03617412  0.101174144   -0.104794100   -0.10133502
##              Humidity... Pressure.in. Visibility.mi. Wind_Speed.mph.

```

```

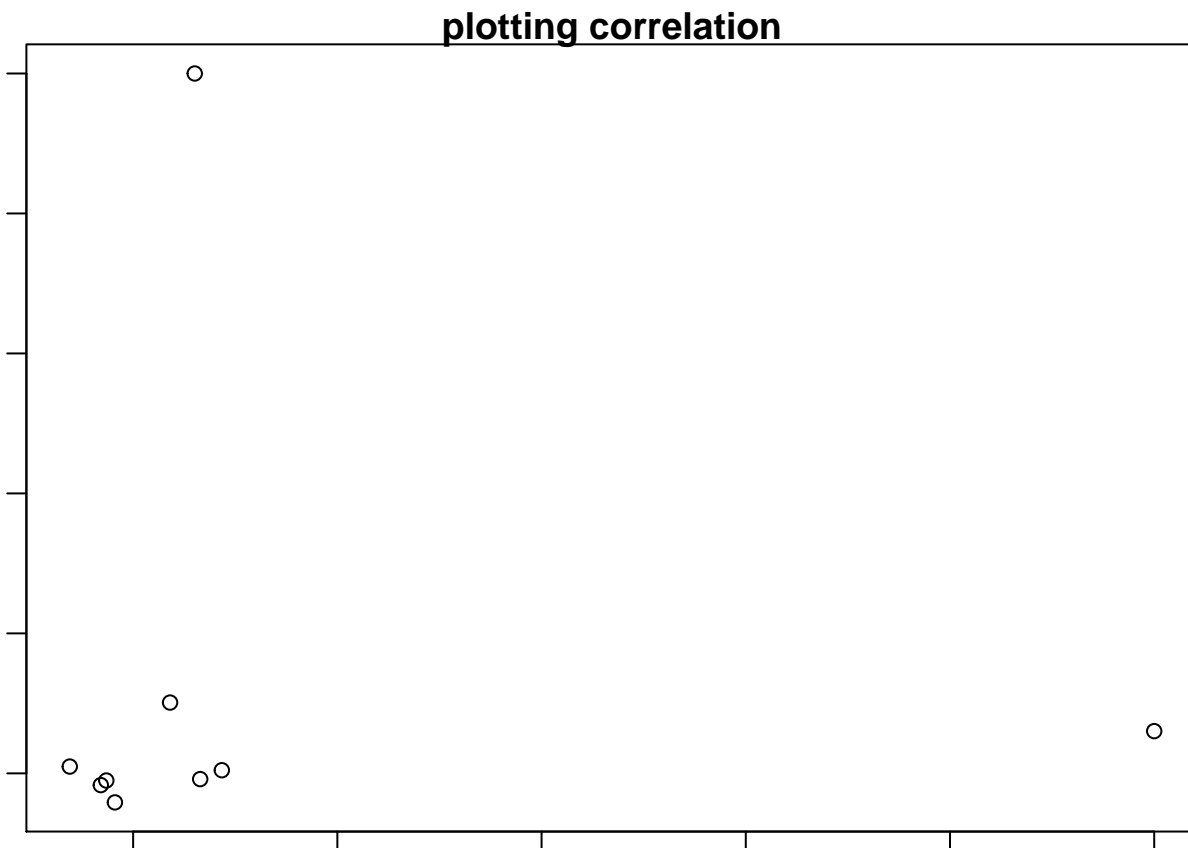
## Severity          0.086876542  0.065671149   -0.01784787   -0.062056779
## Distance.mi.      0.004473866 -0.008218439   -0.04147742    0.009728557
## Temperature.F.    -0.452662114  0.055390478    0.25676600    0.004761887
## Wind_Chill.F.     -0.435379799  0.050407389    0.26208308   -0.050698506
## Humidity...        1.000000000  0.233181450   -0.39892391   -0.137092830
## Pressure.in.       0.233181450  1.000000000   -0.26428984   -0.014390090
## Visibility.mi.    -0.398923914 -0.264289840    1.00000000    0.014696688
## Wind_Speed.mph.   -0.137092830 -0.014390090    0.01469669    1.000000000
## Precipitation.in.  0.244133880  0.007382003   -0.24473243    0.020686860
##                   Precipitation.in.
## Severity          0.036174121
## Distance.mi.      0.101174144
## Temperature.F.    -0.104794100
## Wind_Chill.F.     -0.101335015
## Humidity...        0.244133880
## Pressure.in.       0.007382003
## Visibility.mi.    -0.244732428
## Wind_Speed.mph.    0.020686860
## Precipitation.in.  1.000000000

```

```

par(mar=c(1,1,1,1))
plot(cor.num,main ="plotting correlation" )

```



```

##### Applying FA #####

```

```
# applying basic component analysis
num_pca<-prcomp(num[-1],scale=TRUE)
summary(num_pca)
```

```
## Importance of components:
##              PC1      PC2      PC3      PC4      PC5      PC6      PC7
## Standard deviation    1.597 1.1667 1.0425 1.0017 0.9458 0.78011 0.69928
## Proportion of Variance 0.319 0.1701 0.1359 0.1254 0.1118 0.07607 0.06112
## Cumulative Proportion 0.319 0.4891 0.6250 0.7504 0.8622 0.93830 0.99943
##              PC8
## Standard deviation    0.06762
## Proportion of Variance 0.00057
## Cumulative Proportion 1.00000
```

```
plot(num_pca)
```

```
# A table containing eigenvalues and %'s accounted, follows.
# Eigenvalues are the square of sdev
eigen_num<-round(num_pca$sdev^2,2)
names(eigen_num) <- paste("PC",1:8,sep="")
eigen_num
```

```
## PC1 PC2 PC3 PC4 PC5 PC6 PC7 PC8
## 2.55 1.36 1.09 1.00 0.89 0.61 0.49 0.00
```

```
# sum of eigen values
sumlambdas<-sum(eigen_num)
sumlambdas
```

```
## [1] 7.99
```

```
# cumulative variance
propvar<-round(eigen_num/sumlambdas,2)
propvar
```

```
## PC1 PC2 PC3 PC4 PC5 PC6 PC7 PC8
## 0.32 0.17 0.14 0.13 0.11 0.08 0.06 0.00
```

```
cumvar_num<-cumsum(propvar)
cumvar_num
```

```
## PC1 PC2 PC3 PC4 PC5 PC6 PC7 PC8
## 0.32 0.49 0.63 0.76 0.87 0.95 1.01 1.01
```

```
# matrix representation
matlambdas<-rbind(eigen_num,propvar,cumvar_num)
rownames(matlambdas)<-c("Eigen Values","Prop variance","Cum prop variance")
rownames(matlambdas)
```

```
## [1] "Eigen Values"      "Prop variance"      "Cum prop variance"
```

```
matlambdas
```

```
##          PC1  PC2  PC3  PC4  PC5  PC6  PC7  PC8
## Eigen Values    2.55 1.36 1.09 1.00 0.89 0.61 0.49 0.00
## Prop variance    0.32 0.17 0.14 0.13 0.11 0.08 0.06 0.00
## Cum prop variance 0.32 0.49 0.63 0.76 0.87 0.95 1.01 1.01
```

```
# finding rotation
```

```
eigvec.num<-num_pca$rotation
print(num_pca)
```

```
## Standard deviations (1, ..., p=8):
## [1] 1.59740855 1.16671448 1.04253065 1.00172722 0.94583576 0.78010888 0.69927682
## [8] 0.06761998
##
## Rotation (n x k) = (8 x 8):
##          PC1          PC2          PC3          PC4          PC5
## Distance.mi.    0.03299214  0.09167888 -0.67577224  0.346916744 -0.64067479
## Temperature.F. -0.55671719  0.35283583 -0.05523049 -0.002190388  0.09206665
## Wind_Chill.F.   -0.55379326  0.35939160 -0.02958699  0.047477440  0.10295613
## Humidity...     0.45629327  0.26100539  0.13274621  0.096229671  0.04287644
## Pressure.in.    0.09164310  0.60262404  0.26227289 -0.321989528 -0.38697996
## Visibility.mi.  -0.35175345 -0.43631817  0.04370157  0.136984938 -0.03883893
## Wind_Speed.mph. -0.02519228 -0.16711448 -0.42987104 -0.854084331 -0.01391882
## Precipitation.in. 0.20328150  0.29725274 -0.51604120  0.127387380  0.64588351
##          PC6          PC7          PC8
## Distance.mi.    0.004652525  0.05461286 -0.004330718
## Temperature.F. -0.075086133  0.21710333  0.708003954
## Wind_Chill.F.   -0.066892793  0.22113505 -0.705014809
## Humidity...     0.226745346  0.80212090  0.011880585
## Pressure.in.    0.426339604 -0.35275577 -0.005089370
## Visibility.mi.  0.809491360  0.09154297  0.007511633
## Wind_Speed.mph. 0.040132564  0.23227370 -0.037861794
## Precipitation.in. 0.315911359 -0.26611485  0.002962351
```

```
eigvec.num
```

```
##          PC1          PC2          PC3          PC4          PC5
## Distance.mi.    0.03299214  0.09167888 -0.67577224  0.346916744 -0.64067479
## Temperature.F. -0.55671719  0.35283583 -0.05523049 -0.002190388  0.09206665
## Wind_Chill.F.   -0.55379326  0.35939160 -0.02958699  0.047477440  0.10295613
## Humidity...     0.45629327  0.26100539  0.13274621  0.096229671  0.04287644
## Pressure.in.    0.09164310  0.60262404  0.26227289 -0.321989528 -0.38697996
## Visibility.mi.  -0.35175345 -0.43631817  0.04370157  0.136984938 -0.03883893
## Wind_Speed.mph. -0.02519228 -0.16711448 -0.42987104 -0.854084331 -0.01391882
## Precipitation.in. 0.20328150  0.29725274 -0.51604120  0.127387380  0.64588351
##          PC6          PC7          PC8
## Distance.mi.    0.004652525  0.05461286 -0.004330718
## Temperature.F. -0.075086133  0.21710333  0.708003954
## Wind_Chill.F.   -0.066892793  0.22113505 -0.705014809
## Humidity...     0.226745346  0.80212090  0.011880585
## Pressure.in.    0.426339604 -0.35275577 -0.005089370
```

```
## Visibility.mi.      0.809491360  0.09154297  0.007511633
## Wind_Speed.mph.    0.040132564  0.23227370 -0.037861794
## Precipitation.in.  0.315911359 -0.26611485  0.002962351
```

```
# Taking the first 4 PCs to generate linear combinations for all the variables with four factors
pcafactores.num<-eigvec.num[,1:4]
pcafactores.num
```

```
##              PC1          PC2          PC3          PC4
## Distance.mi.    0.03299214  0.09167888 -0.67577224  0.346916744
## Temperature.F. -0.55671719  0.35283583 -0.05523049 -0.002190388
## Wind_Chill.F.   -0.55379326  0.35939160 -0.02958699  0.047477440
## Humidity...     0.45629327  0.26100539  0.13274621  0.096229671
## Pressure.in.    0.09164310  0.60262404  0.26227289 -0.321989528
## Visibility.mi.  -0.35175345 -0.43631817  0.04370157  0.136984938
## Wind_Speed.mph. -0.02519228 -0.16711448 -0.42987104 -0.854084331
## Precipitation.in. 0.20328150  0.29725274 -0.51604120  0.127387380
```

```
# Multiplying each column of the eigenvector's matrix by the square root of
# the corresponding eigenvalue in order to get the factor loadings
unrot.fact.num<-sweep(pcafactores.num,MARGIN=2,num_pca$sdev[1:4],`*`)
unrot.fact.num
```

```
##              PC1          PC2          PC3          PC4
## Distance.mi.    0.05270192  0.1069631 -0.70451327  0.347515947
## Temperature.F. -0.88930479  0.4116587 -0.05757948 -0.002194171
## Wind_Chill.F.   -0.88463409  0.4193074 -0.03084534  0.047559444
## Humidity...     0.72888678  0.3045188  0.13839200  0.096395881
## Pressure.in.    0.14639147  0.7030902  0.27342752 -0.322545675
## Visibility.mi.  -0.56189397 -0.5090587  0.04556023  0.137221541
## Wind_Speed.mph. -0.04024236 -0.1949749 -0.44815374 -0.855559525
## Precipitation.in. 0.32472360  0.3468091 -0.53798876  0.127607406
```

```
# Computing communalities
communalities.num<-rowSums(unrot.fact.num^2)
communalities.num
```

```
##      Distance.mi.      Temperature.F.      Wind_Chill.F.      Humidity...
##      0.6313249        0.9636461          0.9616095          0.6524521
##      Pressure.in.      Visibility.mi.      Wind_Speed.mph.      Precipitation.in.
##      0.6945646         0.5957711          0.9724585          0.5314375
```

```
# Performance the varimax rotation. The default in the varimax function is norm=TRUE
# thus Kaiser normalization is carried out
rot.fact.num<-varimax(unrot.fact.num)
# View(unrot.fact.num)
rot.fact.num
```

```
## $loadings
##
## Loadings:
##              PC1      PC2      PC3      PC4
```

```
## Distance.mi.          -0.146 -0.779
## Temperature.F.      -0.981
## Wind_Chill.F.       -0.978
## Humidity...         0.518  0.554 -0.136  0.242
## Pressure.in.        -0.176  0.802  0.143
## Visibility.mi.      -0.263 -0.687  0.232
## Wind_Speed.mph.          -0.986
## Precipitation.in.     0.268 -0.670
##
##          PC1   PC2   PC3   PC4
## SS loadings  2.298 1.519 1.150 1.036
## Proportion Var 0.287 0.190 0.144 0.130
## Cumulative Var 0.287 0.477 0.621 0.750
##
## $rotmat
##          [,1]      [,2]      [,3]      [,4]
## [1,]  0.887829829  0.4137326 -0.1937616  0.0551357
## [2,] -0.455619619  0.8301498 -0.2622463  0.1857119
## [3,]  0.063951981  0.2132549  0.8722795  0.4353861
## [4,]  0.008893847 -0.3069185 -0.3644336  0.8791531
```

*# The print method of varimax omits loadings less than abs(0.1) in order to display all the loadings
it is necessary to ask explicitly the contents of the object\$loadings*

```
fact.load.num<-rot.fact.num$loadings[1:8,1:4]
fact.load.num
```

```
##          PC1          PC2          PC3          PC4
## Distance.mi.    -0.04390840 -0.14630006 -0.77944122  0.0215544818
## Temperature.F.  -0.98081292 -0.03780170  0.01493140  0.0004191444
## Wind_Chill.F.   -0.97799884 -0.03908882  0.01720830  0.0574778401
## Humidity...     0.51809047  0.55428752 -0.13550261  0.2417411203
## Pressure.in.    -0.17575341  0.80154211  0.14330383 -0.0258768697
## Visibility.mi.  -0.26279499 -0.68746876  0.23210537  0.0149563580
## Wind_Speed.mph.  0.01683648 -0.01149186 -0.02019178 -0.9857156207
## Precipitation.in. 0.09701576  0.26835845 -0.66964935 -0.0397359697
```

*# Computing the rotated factor scores for the us accident instances
Notice that the signs*

```
scale.num<-scale(num[-1])
scale.num
```

```
##      Distance.mi. Temperature.F. Wind_Chill.F. Humidity... Pressure.in.
## 1    -0.28610927    0.792252656    0.76994937 -0.27141849 -0.0470713061
## 2    -0.28610927    1.738527279    1.61889814 -1.35121835  0.0003796073
## 3    -0.28610927    1.370531592    1.28875140 -0.22822650  0.6172414818
## 4    -0.28610927    0.266544533    0.29831116  1.02434134  0.1427323476
## 5    -0.28610927   -0.522017652   -0.40914614 -0.22822650  0.2455426600
## 6    -0.28610927   -1.363150650   -1.49391402  1.36987729 -0.0233458494
## 7    -0.28610927   -2.887704208   -3.09748391 -0.27141849  0.3246275157
## 8    -0.28610927    0.792252656    0.76994937 -0.44418647  0.1269153764
## 9      2.12389017   -1.205438213   -1.02227581  1.02434134  0.0478305207
## 10    0.40106624   -0.890013339   -0.92794817 -0.87610641  0.2692681167
## 11   -0.28610927    0.371686157    0.39263881 -1.13525838  0.4669802559
```

## 12	-0.28610927	-0.311734403	-0.22049086	-0.09865052	0.7437772509
## 13	-0.28610927	1.580814842	1.47740668	-2.04229026	-0.2210579886
## 14	-0.28610927	1.423102405	1.33591522	-2.47421021	-0.1973325319
## 15	-0.28610927	-1.205438213	-1.02227581	0.16050145	-2.5936036596
## 16	-0.28610927	-0.101451154	-0.03183558	1.24030131	0.4195293425
## 17	-0.28610927	-0.101451154	-0.03183558	0.80838137	-0.1261561618
## 18	-0.28610927	-0.837442527	-0.78645671	0.93795735	0.6330584529
## 19	0.51993783	-0.364305215	-0.26765468	-1.61037032	0.1585493187
## 20	-0.28610927	-0.942584151	-0.78645671	-0.18503450	-0.3396852722
## 21	-0.28610927	0.161402908	0.20398352	0.46284541	0.5065226838
## 22	-0.28610927	0.056261283	0.10965588	-0.70333844	0.2455426600
## 23	-0.28610927	-0.732300902	-0.59780143	-0.01226653	0.2850850878
## 24	-0.28610927	0.634540219	0.62845791	-0.01226653	0.1822747754
## 25	-0.28610927	0.739681844	0.72278555	-1.09206639	-3.7007916394
## 26	-0.28610927	0.949965093	0.91144083	-0.18503450	0.5302481405
## 27	-0.28610927	0.266544533	0.29831116	0.85157336	0.0161965784
## 28	-0.28610927	0.213973720	0.25114734	1.24030131	-0.1419731329
## 29	-0.28610927	0.161402908	0.20398352	0.59242140	0.5618820828
## 30	-0.28610927	1.423102405	1.33591522	-0.91929841	0.4590717704
## 31	-0.28610927	0.108832096	0.15681970	-0.61695445	-0.0707967628
## 32	-0.28610927	0.424256970	0.43980263	1.24030131	0.0557390063
## 33	-0.28610927	-1.520863087	-1.30525873	1.06753333	0.5697905683
## 34	-0.28610927	0.371686157	0.39263881	1.54264527	-0.2843258732
## 35	-0.28610927	0.687111032	0.67562173	0.89476536	0.6172414818
## 36	-0.28610927	1.423102405	1.33591522	-2.21505824	-2.7438648854
## 37	-0.28610927	0.739681844	0.72278555	0.80838137	0.6093329962
## 38	-0.28610927	-0.574588465	-0.45630996	-1.56717832	0.6646923952
## 39	2.90551163	-0.101451154	-0.03183558	0.59242140	0.4907057126
## 40	-0.28610927	0.687111032	0.67562173	0.89476536	0.5935160250
## 41	-0.28610927	1.212819155	1.14725993	-0.66014644	0.7675027076
## 42	-0.28610927	-2.256854460	-2.48435425	0.72199738	-0.0707967628
## 43	-0.28610927	-1.258009025	-1.35242255	1.06753333	-0.2052410175
## 44	0.69743103	-0.048880341	0.01532824	-1.43760234	-2.6410545730
## 45	-0.28610927	-0.154021966	-0.07899940	-0.01226653	0.3009020590
## 46	-0.28610927	-1.415721462	-1.21093109	0.76518937	0.4511632848
## 47	-0.28448089	-0.732300902	-0.59780143	0.07411746	-0.5215804403
## 48	-0.17863632	1.370531592	1.28875140	-1.61037032	0.4274378281
## 49	-0.28610927	1.107677530	1.05293229	-0.83291442	0.3720784291
## 50	-0.28610927	0.003690471	0.06249206	1.28349331	0.4669802559
## 51	-0.28610927	1.317960780	1.24158758	-0.40099448	0.5144311693
## 52	-0.28610927	-1.520863087	-1.30525873	0.76518937	0.1269153764
## 53	-0.28610927	0.529398595	0.53413027	0.37646142	0.5697905683
## 54	0.30010680	-1.783717149	-1.77689694	1.19710932	-0.7113840940
## 55	-0.28610927	0.687111032	0.67562173	-1.13525838	0.1506408331
## 56	-0.28610927	1.423102405	1.33591522	-2.08548226	-3.7956934662
## 57	-0.28610927	0.739681844	0.72278555	-1.39441035	0.5618820828
## 58	-0.28610927	-1.363150650	-1.58824166	0.37646142	-0.2606004165
## 59	-0.28610927	-1.258009025	-1.21093109	0.50603741	-1.8897484439
## 60	-0.28610927	0.581969407	0.58129409	-1.39441035	-0.0866137340
## 61	-0.28610927	-1.731146337	-1.87122458	-0.74653043	-3.8194189229
## 62	-0.28610927	-1.888858774	-1.63540548	0.59242140	0.0557390063
## 63	0.26265411	-1.047725776	-1.21093109	-0.27141849	0.2613596311
## 64	-0.28610927	0.371686157	0.39263881	0.03092547	0.5065226838
## 65	-0.28610927	-1.310579838	-1.39958637	1.06753333	0.1190068909

## 66	-0.28610927	-0.522017652	-0.40914614	0.41965342	0.5381566261
## 67	-0.28610927	-1.888858774	-2.09289454	1.19710932	0.8149536210
## 68	0.25614060	0.266544533	0.29831116	-2.12867425	-2.6489630586
## 69	-0.28610927	-0.364305215	-0.26765468	0.54922940	-0.1261561618
## 70	-0.28610927	1.002535906	0.95860465	-1.56717832	-0.5057634692
## 71	1.12569444	-0.574588465	-0.45630996	1.06753333	-0.4741295269
## 72	-0.28610927	0.634540219	0.62845791	1.28349331	0.4986141982
## 73	0.83747153	0.581969407	0.58129409	0.20369345	0.5223396549
## 74	-0.28610927	0.319115345	0.34547499	1.11072533	0.5776990539
## 75	-0.28610927	-2.099142023	-2.61169656	0.33326943	0.7121433086
## 76	-0.28610927	-1.520863087	-1.30525873	1.06753333	0.2455426600
## 77	-0.28610927	0.844823469	0.81711319	0.41965342	0.5697905683
## 78	-0.28610927	-0.364305215	-0.26765468	0.98114934	0.5776990539
## 79	-0.28610927	1.580814842	1.47740668	-1.99909827	-3.5268049568
## 80	10.26578002	0.213973720	0.25114734	-1.35121835	0.5856075395
## 81	-0.28610927	0.792252656	0.76994937	-0.61695445	0.4669802559
## 82	-0.28610927	0.056261283	0.10965588	0.11730946	0.1980917466
## 83	-0.28610927	-0.732300902	-0.59780143	1.41306929	-0.1103391907
## 84	-0.28610927	0.687111032	0.67562173	1.15391732	0.5618820828
## 85	-0.28610927	0.319115345	0.34547499	0.16050145	-0.0312543350
## 86	-0.28610927	1.212819155	1.14725993	-0.31461049	0.2929935734
## 87	-0.28610927	-2.414566897	-2.10704368	0.72199738	-0.1894240464
## 88	5.14778804	-1.463035194	-1.61653995	0.89476536	0.1822747754
## 89	-0.28610927	-0.784871714	-0.64496525	1.54264527	0.4511632848
## 90	-0.28610927	-0.989897882	-1.17320004	0.29007743	0.4274378281
## 91	0.19263386	0.634540219	0.62845791	-0.18503450	0.3878954002
## 92	0.46131622	0.529398595	0.53413027	0.16050145	0.5618820828
## 93	-0.28610927	0.476827782	0.48696645	-0.01226653	0.5618820828
## 94	1.66794438	0.529398595	0.53413027	1.54264527	0.5776990539
## 95	-0.28610927	-0.154021966	-0.07899940	0.80838137	0.2613596311
## 96	-0.13792687	-1.152867401	-1.25809491	0.50603741	-0.5373974114
## 97	-0.28610927	0.949965093	0.91144083	-1.30802636	0.4195293425
## 98	2.04247115	-1.731146337	-1.72030035	1.36987729	0.7279602797
## 99	-0.28610927	-1.731146337	-1.49391402	-0.35780248	-4.1753007735
## 100	-0.28610927	0.581969407	0.58129409	0.07411746	0.6251499673
## 101	-0.28610927	1.423102405	1.33591522	-0.22822650	0.4511632848
## 102	-0.28610927	1.055106718	1.00576847	-1.13525838	0.4827972271
## 103	-0.28122413	-0.784871714	-0.88078435	-0.14184251	-1.4073308241
## 104	-0.28610927	1.002535906	0.95860465	0.20369345	0.5381566261
## 105	-0.28610927	0.687111032	0.67562173	-1.52398633	0.6409669385
## 106	-0.28610927	1.475673217	1.38307904	-0.96249040	-0.5057634692
## 107	1.15500524	-0.154021966	-0.07899940	-0.09865052	0.7358687653
## 108	-0.28610927	-0.101451154	-0.03183558	-1.22164237	0.0952814341
## 109	-0.28610927	-0.364305215	-0.26765468	-0.40099448	0.9098554478
## 110	0.05422173	-0.206592778	-0.12616322	-1.22164237	-2.6885054864
## 111	-0.22748766	1.475673217	1.38307904	-2.38782622	-2.9257600535
## 112	-0.28610927	-0.154021966	-0.07899940	-0.31461049	0.2297256888
## 113	-0.28610927	0.687111032	0.67562173	0.16050145	-0.3159598155
## 114	0.64857969	0.424256970	0.43980263	-0.57376245	-0.4741295269
## 115	-0.28610927	1.423102405	1.33591522	-0.22822650	0.5460651116
## 116	-0.28610927	-0.048880341	0.01532824	0.50603741	0.5065226838
## 117	-0.28610927	-0.989897882	-0.90436626	0.76518937	0.8703130200
## 118	-0.28610927	0.108832096	0.15681970	-0.48737846	-1.8343890449
## 119	-0.28610927	-0.574588465	-0.45630996	-0.14184251	0.8544960488

## 120	-0.28610927	0.581969407	0.58129409	0.50603741	0.4748887415
## 121	0.41735002	-0.942584151	-1.16376727	0.93795735	0.1506408331
## 122	-0.28610927	-0.522017652	-0.40914614	0.80838137	0.7279602797
## 123	-0.28610927	0.003690471	0.06249206	-0.05545852	0.2534511455
## 124	-0.28610927	0.003690471	0.06249206	-0.44418647	0.4907057126
## 125	-0.28610927	-0.995154964	-1.11660345	-0.87610641	0.8544960488
## 126	-0.28610927	-0.837442527	-1.16376727	0.07411746	-0.2131495031
## 127	-0.28610927	0.213973720	0.25114734	-0.87610641	-2.8150412555
## 128	-0.28610927	0.213973720	0.25114734	0.72199738	0.6330584529
## 129	0.60298511	0.897394281	0.86427701	-1.04887439	0.0557390063
## 130	-0.28610927	0.634540219	0.62845791	1.28349331	0.6963263375
## 131	-0.28610927	1.160248343	1.10009611	-0.78972243	0.0399220352
## 132	-0.28610927	-0.311734403	-0.22049086	1.02434134	0.5776990539
## 133	-0.28610927	0.476827782	0.48696645	1.28349331	0.6093329962
## 134	-0.28610927	1.580814842	1.47740668	-0.74653043	0.5302481405
## 135	-0.28610927	-0.574588465	-0.45630996	1.54264527	0.0952814341
## 136	0.96774178	0.056261283	0.10965588	-1.04887439	-0.6243907527
## 137	5.72260556	-1.815259636	-2.03629795	0.93795735	0.7042348230
## 138	-0.28610927	-0.784871714	-0.92794817	0.93795735	0.7042348230
## 139	-0.28610927	0.792252656	0.76994937	1.36987729	0.4827972271
## 140	-0.28610927	0.634540219	0.62845791	-0.57376245	-0.4029531568
## 141	-0.28610927	0.213973720	0.25114734	-1.35121835	-2.9890279381
## 142	-0.28610927	0.792252656	0.76994937	1.06753333	0.6172414818
## 143	2.10272122	-0.364305215	-0.26765468	0.98114934	-0.0154373638
## 144	-0.28610927	1.317960780	1.24158758	-0.05545852	0.5065226838
## 145	-0.28610927	0.687111032	0.67562173	-1.95590627	0.4986141982
## 146	-0.28610927	1.685956466	1.57173432	-1.82633029	0.3641699435
## 147	-0.28610927	0.003690471	0.06249206	1.54264527	0.0873729486
## 148	-0.28610927	1.896239716	1.76038960	-1.48079434	0.0082880929
## 149	1.40740377	1.265389967	1.19442376	-0.48737846	0.3720784291
## 150	-0.28610927	0.108832096	0.15681970	0.98114934	0.2218172033
## 151	-0.28610927	0.424256970	0.43980263	0.07411746	0.0399220352
## 152	-0.28610927	0.213973720	0.25114734	-1.73994630	0.1031899197
## 153	-0.28610927	0.371686157	0.39263881	0.80838137	0.0399220352
## 154	-0.28610927	1.265389967	1.19442376	-1.04887439	0.6409669385
## 155	-0.28610927	0.687111032	0.67562173	-1.65356231	-2.9494855102
## 156	-0.28610927	0.266544533	0.29831116	-1.91271428	-3.8194189229
## 157	-0.28610927	0.949965093	0.91144083	-1.39441035	-0.1103391907
## 158	-0.28610927	-0.469446840	-0.36198232	0.46284541	0.1269153764
## 159	-0.28610927	-0.732300902	-0.59780143	1.41306929	0.4986141982
## 160	-0.28610927	-0.259163591	-0.17332704	1.11072533	0.1585493187
## 161	-0.26656873	-1.888858774	-2.15420750	0.59242140	-0.1498816185
## 162	-0.28610927	0.108832096	0.15681970	0.72199738	0.1506408331
## 163	-0.28610927	-0.574588465	-0.45630996	-0.96249040	0.7516857364
## 164	-0.28610927	-0.942584151	-1.25809491	-0.78972243	0.5144311693
## 165	-0.26982549	-1.047725776	-1.10717069	1.24030131	0.5460651116
## 166	-0.28610927	-0.679730090	-0.55063760	1.54264527	-0.3950446712
## 167	-0.28610927	-0.416876028	-0.31481850	-0.87610641	-1.4152393097
## 168	-0.28610927	-0.311734403	-0.22049086	0.54922940	0.4907057126
## 169	-0.28610927	-0.469446840	-0.36198232	0.46284541	0.5144311693
## 170	-0.26982549	-1.095039507	-1.18263280	1.36987729	0.1664578043
## 171	-0.28610927	0.266544533	0.29831116	-0.53057046	0.2771766023
## 172	-0.28610927	1.633385654	1.52457050	-0.91929841	0.5856075395
## 173	-0.28610927	1.896239716	1.76038960	-1.39441035	-0.0312543350

## 174	-0.28610927	0.108832096	0.15681970	0.98114934	0.5697905683
## 175	-0.28610927	1.002535906	0.95860465	0.76518937	0.5935160250
## 176	-0.28610927	0.897394281	0.86427701	0.11730946	0.3878954002
## 177	-0.28610927	0.161402908	0.20398352	0.85157336	0.5776990539
## 178	-0.28610927	0.213973720	0.25114734	1.11072533	-0.1024307051
## 179	0.78862020	-1.152867401	-1.11660345	1.54264527	0.7121433086
## 180	-0.28610927	0.056261283	0.10965588	1.11072533	0.0320135496
## 181	-0.28610927	-1.100296588	-1.06943963	0.50603741	-2.5145188039
## 182	-0.28610927	0.161402908	0.20398352	0.03092547	0.5856075395
## 183	-0.25842684	-0.311734403	-0.22049086	-0.22822650	-2.7517733710
## 184	1.18105929	-1.573433900	-1.77689694	-0.44418647	-0.3396852722
## 185	2.80780885	-0.574588465	-0.45630996	0.67880538	0.6488754240
## 186	-0.28610927	0.792252656	0.76994937	-0.83291442	0.5935160250
## 187	-0.25028495	-1.573433900	-1.58824166	-0.61695445	0.0478305207
## 188	-0.28610927	0.424256970	0.43980263	-1.26483436	0.6093329962
## 189	-0.28610927	0.687111032	0.67562173	-0.09865052	-0.3159598155
## 190	-0.28610927	0.897394281	0.86427701	0.50603741	0.4748887415
## 191	-0.28610927	-1.936172505	-2.11647645	0.85157336	0.6172414818
## 192	-0.28610927	1.475673217	1.38307904	-1.52398633	0.0161965784
## 193	-0.28610927	0.581969407	0.58129409	0.50603741	0.6805093663
## 194	-0.28610927	0.319115345	0.34547499	0.72199738	0.4195293425
## 195	-0.28610927	0.056261283	0.10965588	-0.53057046	0.3167190301
## 196	-0.28610927	0.634540219	0.62845791	-0.48737846	0.6884178519
## 197	-0.28610927	1.265389967	1.19442376	-0.22822650	0.5302481405
## 198	-0.28610927	0.844823469	0.81711319	-1.56717832	0.1664578043
## 199	-0.28610927	0.581969407	0.58129409	-1.65356231	-0.4662210413
## 200	-0.28610927	-1.152867401	-1.11660345	-0.74653043	0.8624045344
## 201	-0.28610927	-1.683832605	-2.00799966	1.19710932	0.2771766023
## 202	-0.28610927	-0.890013339	-0.95624646	0.93795735	0.7358687653
## 203	-0.28610927	0.844823469	0.81711319	0.33326943	-0.3080513299
## 204	-0.28610927	-1.836287961	-2.01271604	0.93795735	-0.4899464980
## 205	-0.28610927	-0.784871714	-0.88078435	1.06753333	-0.2131495031
## 206	-0.28610927	0.266544533	0.29831116	0.24688544	-0.3238683011
## 207	1.03287689	1.265389967	1.19442376	-1.22164237	0.6251499673
## 208	-0.28610927	0.844823469	0.81711319	-0.53057046	0.3483529724
## 209	-0.28610927	-0.837442527	-0.69212907	-0.53057046	0.6330584529
## 210	-0.28610927	1.212819155	1.14725993	-0.05545852	0.1506408331
## 211	-0.28610927	0.739681844	0.72278555	1.06753333	0.5935160250
## 212	2.93156562	0.634540219	0.62845791	0.03092547	0.4748887415
## 213	-0.28610927	0.844823469	0.81711319	-0.96249040	-3.9064122642
## 214	-0.28610927	1.317960780	1.24158758	-0.22822650	0.5381566261
## 215	-0.12164309	0.634540219	0.62845791	0.98114934	0.5223396549
## 216	-0.28610927	0.687111032	0.67562173	-0.35780248	0.2771766023
## 217	-0.28610927	0.581969407	0.58129409	-0.40099448	0.2771766023
## 218	-0.28610927	-1.363150650	-1.49391402	0.98114934	-0.4108616423
## 219	0.15355280	-0.101451154	-0.03183558	-0.27141849	-0.3159598155
## 220	-0.28610927	1.160248343	1.10009611	0.33326943	0.5144311693
## 221	-0.28610927	1.212819155	1.14725993	-1.69675431	-1.4785071942
## 222	2.92179539	1.107677530	1.05293229	-0.83291442	-0.2131495031
## 223	-0.28610927	1.423102405	1.33591522	-0.40099448	0.4353463136
## 224	6.11341629	-0.154021966	-0.07899940	0.80838137	-0.2685089021
## 225	-0.28610927	-0.679730090	-0.55063760	-1.52398633	-0.1973325319
## 226	-0.28610927	-0.101451154	-0.03183558	1.11072533	-0.0945222195
## 227	-0.28610927	-0.574588465	-0.45630996	0.54922940	-0.0233458494

## 228	-0.28610927	-0.416876028	-0.31481850	-0.14184251	0.2850850878
## 229	-0.28610927	-0.679730090	-0.55063760	0.93795735	-0.4978549836
## 230	-0.28610927	-0.416876028	-0.31481850	1.36987729	0.6172414818
## 231	-0.28610927	0.949965093	0.91144083	-2.08548226	0.0873729486
## 232	-0.28610927	-0.574588465	-0.45630996	0.54922940	0.5539735972
## 233	-0.15583903	0.634540219	0.62845791	0.98114934	0.3799869147
## 234	-0.28610927	-0.574588465	-0.45630996	0.29007743	-0.0075288783
## 235	-0.28610927	1.055106718	1.00576847	0.03092547	0.4748887415
## 236	-0.28610927	0.476827782	0.48696645	0.59242140	-0.0866137340
## 237	-0.28610927	-0.206592778	-0.12616322	-0.57376245	0.6251499673
## 238	-0.28610927	-0.416876028	-0.31481850	0.33326943	-3.7166086105
## 239	-0.28610927	-0.101451154	-0.03183558	-0.22822650	0.7042348230
## 240	-0.28610927	-0.206592778	-0.12616322	-0.18503450	0.1585493187
## 241	-0.28610927	1.212819155	1.14725993	0.63561339	0.5223396549
## 242	-0.28610927	0.319115345	0.34547499	-0.83291442	0.4116208569
## 243	-0.28610927	-0.732300902	-0.88078435	-1.35121835	0.8149536210
## 244	0.67626212	1.002535906	0.95860465	-1.35121835	0.0241050640
## 245	-0.28610927	0.844823469	0.81711319	-0.61695445	0.3878954002
## 246	-0.28610927	-1.258009025	-1.44675020	-1.43760234	-4.0013140910
## 247	-0.28610927	0.266544533	0.29831116	1.11072533	0.2376341744
## 248	-0.28610927	0.424256970	0.43980263	0.72199738	0.4827972271
## 249	-0.28610927	-0.364305215	-0.26765468	1.54264527	0.5065226838
## 250	-0.28610927	1.370531592	1.28875140	0.11730946	0.4590717704
## 251	1.29993088	0.424256970	0.43980263	1.49945328	0.0952814341
## 252	-0.28610927	1.055106718	1.00576847	0.20369345	0.5460651116
## 253	-0.28610927	1.055106718	1.00576847	-1.52398633	-0.1736070752
## 254	-0.28610927	-3.255699895	-3.28613920	0.59242140	0.1190068909
## 255	-0.28610927	-1.941429586	-2.05987986	0.85157336	-4.4916401963
## 256	0.94820124	1.423102405	1.33591522	-0.40099448	0.0161965784
## 257	-0.28610927	-1.258009025	-1.17320004	1.54264527	0.7121433086
## 258	-0.28610927	0.266544533	0.29831116	0.37646142	-0.0707967628
## 259	1.52790380	1.107677530	1.05293229	0.50603741	0.6409669385
## 260	-0.28610927	-1.568176818	-1.67785292	1.36987729	0.4195293425
## 261	-0.28610927	0.476827782	0.48696645	1.24030131	0.1427323476
## 262	0.96611340	-0.048880341	0.01532824	0.03092547	0.3799869147
## 263	-0.28610927	0.739681844	0.72278555	-0.35780248	0.5302481405
## 264	-0.28610927	-0.890013339	-0.73929289	0.89476536	0.6646923952
## 265	-0.28610927	0.319115345	0.34547499	-0.96249040	0.2376341744
## 266	-0.28610927	0.424256970	0.43980263	1.11072533	0.6726008807
## 267	0.26102573	0.529398595	0.53413027	0.41965342	0.0557390063
## 268	-0.28610927	1.160248343	1.10009611	-0.57376245	-0.1103391907
## 269	-0.28610927	0.739681844	0.72278555	-1.04887439	0.3404444868
## 270	-0.28610927	-0.469446840	-0.36198232	0.46284541	0.6251499673
## 271	-0.28610927	-0.679730090	-0.55063760	-1.04887439	-3.7245170961
## 272	-0.22260253	-0.364305215	-0.26765468	-0.31461049	0.5065226838
## 273	-0.28610927	-0.522017652	-0.40914614	1.06753333	-0.0945222195
## 274	-0.28610927	0.844823469	0.81711319	-0.83291442	-0.0945222195
## 275	-0.28610927	0.844823469	0.81711319	1.02434134	-0.0391628205
## 276	-0.28610927	-0.364305215	-0.26765468	0.98114934	0.4432547992
## 277	-0.28610927	-1.731146337	-2.04573072	0.63561339	0.4353463136
## 278	-0.16235254	0.161402908	0.20398352	1.02434134	0.6726008807
## 279	-0.28610927	-2.519708522	-2.95599245	0.54922940	0.0478305207
## 280	-0.28610927	0.949965093	0.91144083	-1.13525838	0.3088105445
## 281	-0.28610927	-0.784871714	-0.92794817	1.54264527	-0.9723641178

## 282	-0.28610927	-1.626004712	-1.77689694	-0.57376245	0.5381566261
## 283	-0.28610927	1.002535906	0.95860465	0.20369345	0.5618820828
## 284	-0.28610927	0.529398595	0.53413027	-0.66014644	0.4116208569
## 285	-0.28610927	-0.206592778	-0.12616322	1.28349331	0.1980917466
## 286	0.57693101	-0.627159277	-0.50347378	0.16050145	0.7200517942
## 287	-0.28610927	1.002535906	0.95860465	-2.25825024	0.5856075395
## 288	-0.28610927	-1.783717149	-1.54107784	0.89476536	-2.5619697173
## 289	-0.28610927	-0.101451154	-0.03183558	-1.09206639	0.7042348230
## 290	-0.28610927	1.055106718	1.00576847	-2.25825024	-2.6964139720
## 291	-0.28610927	1.160248343	1.10009611	-1.13525838	0.5065226838
## 292	-0.28610927	1.212819155	1.14725993	-0.40099448	0.6805093663
## 293	-0.28610927	-0.416876028	-0.31481850	-1.04887439	0.3720784291
## 294	-0.28610927	-0.101451154	-0.03183558	-1.86952229	-0.1103391907
## 295	0.31313383	-0.259163591	-0.17332704	-1.39441035	0.2218172033
## 296	-0.28610927	0.476827782	0.48696645	-0.66014644	0.4432547992
## 297	-0.28610927	-2.099142023	-2.35701193	0.33326943	0.8861299911
## 298	-0.28610927	0.056261283	0.10965588	0.98114934	0.0636474919
## 299	-0.28610927	-0.574588465	-0.45630996	1.41306929	0.1110984053
## 300	-0.28610927	-0.416876028	-0.31481850	-0.01226653	0.1110984053
## 301	-0.28610927	-1.100296588	-1.11660345	-1.17845038	0.7279602797
## 302	-0.05162284	-0.890013339	-0.73929289	0.93795735	0.6409669385
## 303	-0.28610927	-0.206592778	-0.12616322	1.54264527	-0.2526919309
## 304	-0.28610927	-0.469446840	-0.36198232	1.02434134	0.6330584529
## 305	-0.28610927	1.160248343	1.10009611	-1.04887439	0.2060002321
## 306	-0.28610927	-0.416876028	-0.31481850	0.11730946	0.1190068909
## 307	-0.28610927	-0.259163591	-0.17332704	0.33326943	0.6488754240
## 308	-0.28610927	0.371686157	0.39263881	-0.05545852	0.5935160250
## 309	-0.28610927	-2.099142023	-2.49850339	0.89476536	0.6093329962
## 310	-0.28610927	0.319115345	0.34547499	0.85157336	-0.2210579886
## 311	-0.28610927	-1.363150650	-1.39958637	0.11730946	-2.8545836834
## 312	-0.28610927	1.212819155	1.14725993	-0.22822650	-0.2052410175
## 313	-0.28610927	-0.784871714	-0.64496525	0.80838137	0.3483529724
## 314	1.92848480	0.476827782	0.48696645	0.98114934	0.0952814341
## 315	-0.28610927	1.002535906	0.95860465	0.41965342	-0.5136719547
## 316	-0.28610927	1.685956466	1.57173432	-1.95590627	-0.8062859208
## 317	-0.28610927	-1.363150650	-1.16376727	0.76518937	0.6409669385
## 318	-0.28610927	-2.309425272	-2.48435425	0.16050145	0.1348238620
## 319	-0.28610927	1.580814842	1.47740668	-1.22164237	-0.1024307051
## 320	-0.21283226	1.791098091	1.66606196	-2.34463422	-1.6762193335
## 321	1.70051191	-0.259163591	-0.17332704	0.98114934	0.5381566261
## 322	2.00990363	-2.987588752	-3.48422724	0.37646142	0.6646923952
## 323	-0.28610927	0.529398595	0.53413027	0.98114934	0.0873729486
## 324	1.03776203	1.317960780	1.24158758	-0.05545852	0.5618820828
## 325	-0.28610927	0.897394281	0.86427701	-0.83291442	0.1664578043
## 326	-0.28610927	0.108832096	0.15681970	1.11072533	0.4986141982
## 327	-0.26982549	-1.836287961	-1.83349352	1.02434134	0.6409669385
## 328	-0.28610927	-0.416876028	-0.31481850	0.11730946	0.5065226838
## 329	0.41083651	-1.047725776	-1.30525873	-0.96249040	0.0320135496
## 330	-0.28610927	-0.942584151	-0.97511199	0.67880538	-1.7394872180
## 331	-0.28610927	1.317960780	1.24158758	-1.13525838	0.3720784291
## 332	0.86189721	1.317960780	1.24158758	-0.05545852	0.5697905683
## 333	-0.28610927	-0.732300902	-0.59780143	0.33326943	-0.0470713061
## 334	-0.28610927	-0.679730090	-0.55063760	0.50603741	-0.4187701279
## 335	-0.28610927	1.580814842	1.47740668	-0.74653043	0.1506408331

## 336	-0.11350120	0.634540219	0.62845791	-0.31461049	-2.7438648854
## 337	1.52139031	1.212819155	1.14725993	-1.04887439	-0.9486386611
## 338	0.54924863	0.529398595	0.53413027	-0.87610641	0.4590717704
## 339	0.26916762	0.003690471	0.06249206	0.72199738	0.3878954002
## 340	0.88632292	-0.206592778	-0.12616322	-2.04229026	0.5618820828
## 341	4.01606535	-1.941429586	-2.01271604	0.46284541	-0.2210579886
## 342	-0.28610927	1.475673217	1.38307904	-0.53057046	0.0478305207
## 343	0.67300536	0.003690471	0.06249206	0.03092547	0.0715559774
## 344	0.39618111	-0.206592778	-0.12616322	1.28349331	0.7516857364
## 345	-0.28610927	0.949965093	0.91144083	-2.30144223	-0.3634107289
## 346	-0.28610927	0.529398595	0.53413027	1.36987729	0.4511632848
## 347	-0.28610927	-0.522017652	-0.40914614	-1.30802636	0.3720784291
## 348	-0.28610927	-0.364305215	-0.26765468	0.67880538	0.6014245106
## 349	0.94331611	-0.259163591	-0.17332704	-0.27141849	-0.0549797917
## 350	-0.28610927	-0.154021966	-0.07899940	0.33326943	0.6409669385
## 351	-0.28610927	1.107677530	1.05293229	0.63561339	0.5856075395
## 352	2.87294410	1.580814842	1.47740668	-0.61695445	0.6726008807
## 353	-0.28610927	1.896239716	1.76038960	-1.17845038	-0.3001428443
## 354	-0.28610927	-0.469446840	-0.36198232	-1.30802636	0.3167190301
## 355	-0.28610927	0.897394281	0.86427701	-0.83291442	-0.4266786135
## 356	-0.28610927	-1.315836919	-1.51277954	-0.18503450	0.4827972271
## 357	-0.28610927	-0.048880341	0.01532824	1.24030131	-0.1498816185
## 358	-0.28610927	-0.469446840	-0.36198232	0.54922940	-0.4345870990
## 359	-0.28610927	-0.469446840	-0.36198232	-0.40099448	0.5381566261
## 360	-0.28610927	-0.206592778	-0.12616322	0.33326943	0.7121433086
## 361	-0.28610927	-0.890013339	-0.97511199	0.37646142	-0.1024307051
## 362	-0.28610927	-0.522017652	-0.40914614	0.54922940	0.7200517942
## 363	-0.28610927	0.319115345	0.34547499	-1.78313830	0.1269153764
## 364	-0.28610927	-0.259163591	-0.17332704	0.03092547	0.3167190301
## 365	-0.26331198	0.003690471	0.06249206	-1.73994630	-0.1973325319
## 366	-0.28610927	0.687111032	0.67562173	0.76518937	-0.6243907527
## 367	-0.28610927	0.476827782	0.48696645	-0.70333844	0.5776990539
## 368	-0.28610927	0.213973720	0.25114734	0.98114934	0.4195293425
## 369	-0.28610927	1.265389967	1.19442376	-1.17845038	0.2771766023
## 370	-0.28610927	0.266544533	0.29831116	-0.74653043	-0.1736070752
## 371	-0.28610927	0.108832096	0.15681970	-0.91929841	0.7516857364
## 372	-0.08744715	0.266544533	0.29831116	0.24688544	0.5539735972
## 373	-0.28610927	0.581969407	0.58129409	0.98114934	0.5935160250
## 374	-0.28610927	-0.784871714	-0.83362053	1.54264527	-0.2210579886
## 375	-0.28610927	-0.574588465	-0.45630996	0.80838137	0.3641699435
## 376	-0.28610927	-0.364305215	-0.26765468	0.98114934	-0.1182476762
## 377	0.49551214	0.003690471	0.06249206	0.59242140	0.4907057126
## 378	-0.28610927	-0.469446840	-0.36198232	1.54264527	0.3246275157
## 379	-0.28610927	0.213973720	0.25114734	0.98114934	0.4274378281
## 380	1.22828226	-1.363150650	-1.58824166	1.06753333	0.0003796073
## 381	-0.28610927	-0.416876028	-0.31481850	1.06753333	-0.1894240464
## 382	-0.28610927	0.108832096	0.15681970	-1.43760234	0.6726008807
## 383	-0.26331198	-0.732300902	-0.78645671	1.11072533	-0.0945222195
## 384	0.03468119	0.056261283	0.10965588	-1.13525838	-0.1024307051
## 385	2.59611972	0.739681844	0.72278555	-0.27141849	0.5381566261
## 386	-0.28610927	-0.942584151	-0.93738093	0.93795735	0.7595942220
## 387	-0.28610927	0.949965093	0.91144083	-0.61695445	0.4274378281
## 388	-0.28610927	-0.048880341	0.01532824	-0.61695445	0.4432547992
## 389	-0.04022419	0.319115345	0.34547499	0.98114934	0.1980917466

## 390	0.93517422	-1.258009025	-1.21093109	1.24030131	0.2060002321
## 391	-0.28610927	1.738527279	1.61889814	-1.22164237	0.0003796073
## 392	-0.28610927	1.107677530	1.05293229	-0.91929841	0.5223396549
## 393	-0.28610927	-0.154021966	-0.07899940	0.93795735	0.7516857364
## 394	-0.28610927	-0.311734403	-0.22049086	-1.30802636	0.8782215056
## 395	-0.28610927	0.161402908	0.20398352	-1.17845038	-0.0549797917
## 396	-0.28610927	0.634540219	0.62845791	1.28349331	0.5223396549
## 397	-0.28610927	-1.205438213	-1.02227581	-0.27141849	-0.0391628205
## 398	-0.28610927	1.317960780	1.24158758	-0.22822650	0.2139087177
## 399	-0.28610927	-0.048880341	0.01532824	-0.48737846	0.6726008807
## 400	-0.28610927	-0.469446840	-0.36198232	-0.01226653	0.0952814341
## 401	0.49062703	-0.311734403	-0.22049086	0.76518937	0.1031899197
## 402	-0.11675796	-0.522017652	-0.40914614	0.80838137	-4.0408565189
## 403	-0.28610927	0.319115345	0.34547499	-0.57376245	0.4037123714
## 404	-0.28610927	0.739681844	0.72278555	-0.09865052	0.6172414818
## 405	-0.28610927	-0.416876028	-0.31481850	0.93795735	0.6093329962
## 406	-0.28610927	-1.100296588	-1.30525873	-0.66014644	0.0161965784
## 407	-0.28610927	-2.256854460	-1.96555222	1.28349331	-3.2895503897
## 408	-0.28610927	-0.206592778	-0.12616322	-0.57376245	0.3799869147
## 409	-0.28610927	1.475673217	1.38307904	-2.21505824	-2.5856951740
## 410	-0.28610927	-0.259163591	-0.17332704	-0.57376245	-0.3001428443
## 411	-0.28610927	1.002535906	0.95860465	0.41965342	0.6488754240
## 412	-0.28610927	0.319115345	0.34547499	-0.96249040	0.2613596311
## 413	5.15267304	0.003690471	0.06249206	0.85157336	-0.0312543350
## 414	-0.28610927	0.161402908	0.20398352	-1.17845038	-0.5294889259
## 415	1.42531599	0.949965093	0.91144083	0.03092547	0.1506408331
## 416	1.66794438	1.791098091	1.66606196	-0.70333844	-0.5136719547
## 417	-0.28610927	-0.154021966	-0.07899940	-0.09865052	0.6330584529
## 418	-0.28610927	0.529398595	0.53413027	-0.48737846	0.3878954002
## 419	-0.28610927	0.161402908	0.20398352	0.37646142	0.7675027076
## 420	0.11447172	-0.837442527	-0.69212907	0.93795735	0.6409669385
## 421	-0.28610927	0.213973720	0.25114734	0.24688544	0.6093329962
## 422	-0.28610927	0.003690471	0.06249206	0.24688544	0.1585493187
## 423	1.60932270	1.107677530	1.05293229	-1.17845038	0.4590717704
## 424	-0.28610927	1.791098091	1.66606196	-2.04229026	-0.0312543350
## 425	-0.28610927	-1.520863087	-1.30525873	0.11730946	0.4907057126
## 426	-0.28610927	0.161402908	0.20398352	-2.25825024	-3.9301377209
## 427	-0.28610927	-1.258009025	-1.54107784	0.93795735	-0.2131495031
## 428	-0.28610927	-0.101451154	-0.03183558	0.11730946	0.2692681167
## 429	-0.28610927	-2.361996085	-2.05987986	0.93795735	0.0003796073
## 430	-0.28610927	-1.836287961	-2.01271604	1.15391732	0.0952814341
## 431	-0.28610927	0.003690471	0.06249206	-0.18503450	0.2929935734
## 432	-0.28610927	-0.890013339	-0.99397752	1.54264527	0.6646923952
## 433	-0.28610927	0.056261283	0.10965588	-1.65356231	-0.0470713061
## 434	-0.28610927	0.213973720	0.25114734	-1.22164237	0.6726008807
## 435	-0.28610927	-0.259163591	-0.17332704	-1.43760234	-2.5856951740
## 436	-0.28610927	-0.206592778	-0.12616322	1.28349331	-3.7640595239
## 437	-0.28610927	-0.522017652	-0.40914614	0.41965342	0.6330584529
## 438	5.07125428	-0.311734403	-0.22049086	1.28349331	-0.2526919309
## 439	-0.28610927	1.317960780	1.24158758	-1.09206639	-0.5453058970
## 440	-0.28610927	0.529398595	0.53413027	0.85157336	-0.0154373638
## 441	-0.28610927	0.319115345	0.34547499	0.24688544	0.2771766023
## 442	-0.12652823	-1.520863087	-1.30525873	1.06753333	-1.8185720737
## 443	-0.28610927	-1.520863087	-1.30525873	1.06753333	-3.9064122642

## 444	-0.28610927	0.949965093	0.91144083	-0.27141849	0.0873729486
## 445	-0.28610927	0.266544533	0.29831116	-0.05545852	0.5223396549
## 446	-0.08093364	-1.100296588	-0.92794817	-0.09865052	-2.7913157988
## 447	-0.28610927	1.212819155	1.14725993	-0.31461049	-0.1577901041
## 448	-0.28610927	-0.837442527	-0.97511199	0.67880538	0.3562614579
## 449	-0.28610927	0.371686157	0.39263881	-0.66014644	0.4511632848
## 450	-0.28610927	0.897394281	0.86427701	0.41965342	0.6014245106
## 451	-0.28610927	-0.942584151	-1.06943963	0.93795735	0.7516857364
## 452	-0.28610927	-1.994000398	-2.15420750	1.02434134	-0.2685089021
## 453	-0.28610927	1.423102405	1.33591522	-1.82633029	-0.1815155608
## 454	-0.28610927	0.161402908	0.20398352	1.11072533	0.4274378281
## 455	-0.28610927	1.160248343	1.10009611	-1.00568240	-0.1261561618
## 456	-0.28610927	-1.683832605	-1.99385051	1.36987729	0.3009020590
## 457	-0.02882555	-0.784871714	-0.78645671	1.24030131	0.2218172033
## 458	-0.28610927	0.424256970	0.43980263	-0.96249040	0.8703130200
## 459	-0.28610927	0.213973720	0.25114734	-1.30802636	0.3246275157
## 460	-0.28610927	0.266544533	0.29831116	0.72199738	0.4907057126
## 461	-0.28610927	-0.627159277	-0.50347378	0.07411746	0.6963263375
## 462	-0.28610927	1.528244029	1.43024286	-1.00568240	0.0952814341
## 463	-0.28610927	-0.311734403	-0.22049086	1.54264527	0.6172414818
## 464	0.72348509	-1.731146337	-2.05987986	0.33326943	-0.2843258732
## 465	-0.28610927	-0.679730090	-0.55063760	0.16050145	0.6093329962
## 466	-0.28610927	-1.058239938	-1.01755943	1.24030131	0.5460651116
## 467	-0.28610927	-0.679730090	-0.55063760	-1.35121835	0.1190068909
## 468	-0.28610927	-0.469446840	-0.36198232	0.33326943	0.6330584529
## 469	-0.28610927	-1.095039507	-1.13075260	1.36987729	0.8386790777
## 470	-0.28610927	1.212819155	1.14725993	-0.31461049	0.4748887415
## 471	-0.28610927	-1.310579838	-1.11660345	0.24688544	0.3799869147
## 472	9.06077995	1.633385654	1.52457050	-2.12867425	-2.8466751978
## 473	0.76093777	1.055106718	1.00576847	0.63561339	0.7437772509
## 474	-0.28610927	0.056261283	0.10965588	-1.56717832	0.4986141982
## 475	-0.28610927	1.160248343	1.10009611	0.41965342	0.6014245106
## 476	-0.28610927	-0.890013339	-0.88078435	1.41306929	-0.1894240464
## 477	-0.28610927	-2.887704208	-2.90882863	0.80838137	-0.0233458494
## 478	-0.28610927	-0.259163591	-0.17332704	-0.09865052	0.4195293425
## 479	-0.26982549	-1.247494863	-1.25809491	0.98114934	0.5697905683
## 480	-0.28610927	-0.942584151	-0.97511199	1.11072533	-0.2131495031
## 481	-0.28610927	0.949965093	0.91144083	-1.09206639	0.3878954002
## 482	-0.28610927	0.687111032	0.67562173	1.15391732	0.5539735972
## 483	-0.28610927	1.160248343	1.10009611	0.33326943	0.6014245106
## 484	-0.28610927	-3.203129082	-3.75777740	0.20369345	0.0636474919
## 485	-0.28610927	1.633385654	1.52457050	-2.08548226	-0.2685089021
## 486	-0.23888631	1.107677530	1.05293229	-1.95590627	0.4748887415
## 487	-0.28610927	-0.259163591	-0.17332704	-0.18503450	0.6963263375
## 488	-0.28610927	-0.416876028	-0.31481850	-0.05545852	-0.0470713061
## 489	-0.28610927	0.687111032	0.67562173	1.28349331	0.6330584529
## 490	0.32778923	1.002535906	0.95860465	-0.70333844	0.6251499673
## 491	-0.28610927	0.634540219	0.62845791	-0.31461049	0.4274378281
## 492	-0.28610927	-0.048880341	0.01532824	0.85157336	0.4669802559
## 493	-0.28610927	1.107677530	1.05293229	-0.40099448	-0.3317767866
## 494	-0.28610927	-0.784871714	-1.02227581	-1.00568240	0.4353463136
## 495	-0.28610927	0.476827782	0.48696645	-1.91271428	-0.0549797917
## 496	-0.28610927	0.371686157	0.39263881	1.54264527	0.4037123714
## 497	-0.28610927	-0.364305215	-0.26765468	0.67880538	0.6646923952

## 498	-0.28610927	1.055106718	1.00576847	0.11730946	0.3325360012
## 499	0.85049856	-0.784871714	-0.88078435	0.41965342	0.0399220352
## 500	-0.28610927	-0.942584151	-0.88078435	0.93795735	0.8782215056
##	Visibility.mi.	Wind_Speed.mph.	Precipitation.in.		
## 1	0.253778509	0.75531164	-0.2207742		
## 2	0.253778509	-0.10506978	-0.2207742		
## 3	0.253778509	-0.27714606	-0.2207742		
## 4	-0.779416438	-0.44922235	1.2081849		
## 5	0.253778509	0.75531164	-0.2207742		
## 6	-1.812611385	0.41115907	0.4937053		
## 7	0.253778509	0.06700651	-0.2207742		
## 8	0.253778509	0.75531164	-0.2207742		
## 9	0.253778509	-0.79337492	-0.2207742		
## 10	0.253778509	0.06700651	-0.2207742		
## 11	0.253778509	-0.10506978	-0.2207742		
## 12	0.253778509	0.23908279	-0.2207742		
## 13	0.253778509	0.75531164	-0.2207742		
## 14	0.253778509	0.06700651	-0.2207742		
## 15	-0.521117701	-0.79337492	-0.2207742		
## 16	-0.262818965	1.09946421	4.4233427		
## 17	-0.521117701	-1.30960377	-0.2207742		
## 18	-0.779416438	-0.44922235	-0.2207742		
## 19	0.253778509	0.92738793	-0.2207742		
## 20	0.253778509	-0.79337492	-0.2207742		
## 21	-0.004520228	0.75531164	-0.2207742		
## 22	0.253778509	-0.10506978	-0.2207742		
## 23	0.253778509	-1.30960377	-0.2207742		
## 24	0.253778509	0.23908279	-0.2207742		
## 25	2.836765876	0.23908279	-0.2207742		
## 26	0.253778509	-0.79337492	-0.2207742		
## 27	-0.004520228	-0.44922235	1.5654246		
## 28	-0.004520228	-1.30960377	-0.2207742		
## 29	0.253778509	-0.79337492	-0.2207742		
## 30	0.253778509	-0.10506978	-0.2207742		
## 31	0.253778509	0.06700651	-0.2207742		
## 32	-1.037715175	-0.10506978	5.4950619		
## 33	-2.070910121	-1.30960377	-0.2207742		
## 34	0.253778509	-1.30960377	-0.2207742		
## 35	0.253778509	-0.10506978	-0.2207742		
## 36	0.253778509	0.06700651	-0.2207742		
## 37	0.253778509	-0.10506978	-0.2207742		
## 38	0.253778509	0.06700651	-0.2207742		
## 39	0.253778509	-0.44922235	-0.2207742		
## 40	0.253778509	0.06700651	-0.2207742		
## 41	0.253778509	0.75531164	-0.2207742		
## 42	0.253778509	0.23908279	-0.2207742		
## 43	-1.812611385	0.23908279	-0.2207742		
## 44	0.253778509	-0.10506978	-0.2207742		
## 45	0.253778509	-1.30960377	-0.2207742		
## 46	-1.037715175	-1.30960377	0.4937053		
## 47	0.253778509	-1.30960377	-0.2207742		
## 48	0.253778509	-0.79337492	-0.2207742		
## 49	0.253778509	0.23908279	-0.2207742		
## 50	0.253778509	-1.30960377	-0.2207742		

## 51	0.253778509	1.27154049	-0.2207742
## 52	-0.004520228	-0.79337492	-0.2207742
## 53	0.253778509	-0.27714606	-0.2207742
## 54	-2.135484805	-0.44922235	0.4937053
## 55	0.253778509	2.47607448	-0.2207742
## 56	5.419753242	-0.79337492	-0.2207742
## 57	0.253778509	0.06700651	-0.2207742
## 58	0.253778509	1.09946421	-0.2207742
## 59	0.253778509	-0.44922235	-0.2207742
## 60	0.253778509	-0.79337492	-0.2207742
## 61	0.253778509	0.23908279	-0.2207742
## 62	-0.262818965	-0.79337492	-0.2207742
## 63	0.253778509	0.92738793	-0.2207742
## 64	0.253778509	1.09946421	-0.2207742
## 65	-1.812611385	0.06700651	-0.2207742
## 66	0.253778509	-1.30960377	-0.2207742
## 67	-1.941760753	0.47998959	-0.2207742
## 68	0.253778509	0.23908279	-0.2207742
## 69	0.253778509	0.23908279	-0.2207742
## 70	0.253778509	0.06700651	-0.2207742
## 71	-0.262818965	2.64815077	1.2081849
## 72	0.253778509	-0.79337492	-0.2207742
## 73	-0.521117701	-0.27714606	-0.2207742
## 74	0.253778509	0.92738793	-0.2207742
## 75	-0.004520228	3.25041776	-0.2207742
## 76	-2.070910121	-0.79337492	0.4937053
## 77	0.253778509	-0.44922235	-0.2207742
## 78	0.253778509	-1.30960377	-0.2207742
## 79	0.253778509	0.23908279	-0.2207742
## 80	0.253778509	-0.44922235	-0.2207742
## 81	0.253778509	0.23908279	-0.2207742
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## 83	-2.070910121	-1.30960377	2.6371439
## 84	0.253778509	-0.79337492	-0.2207742
## 85	0.253778509	0.75531164	-0.2207742
## 86	0.253778509	0.06700651	-0.2207742
## 87	-1.037715175	-1.30960377	0.1364656
## 88	-1.683462016	0.47998959	5.4950619
## 89	-2.329208858	-1.30960377	-0.2207742
## 90	0.253778509	1.46082441	-0.2207742
## 91	0.253778509	0.06700651	-0.2207742
## 92	-0.521117701	0.06700651	-0.2207742
## 93	0.253778509	-0.10506978	-0.2207742
## 94	-2.329208858	-1.30960377	-0.2207742
## 95	0.253778509	-0.79337492	-0.2207742
## 96	0.253778509	0.41115907	-0.2207742
## 97	0.253778509	-0.44922235	-0.2207742
## 98	-1.812611385	-0.51805286	-0.2207742
## 99	0.253778509	-0.79337492	-0.2207742
## 100	0.253778509	0.23908279	-0.2207742
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## 104	0.253778509	0.75531164	-0.2207742

## 105	0.253778509	-0.10506978	-0.2207742
## 106	0.253778509	1.61569306	-0.2207742
## 107	0.253778509	-1.30960377	-0.2207742
## 108	0.253778509	-0.79337492	-0.2207742
## 109	0.253778509	-0.27714606	-0.2207742
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## 115	0.253778509	-0.27714606	-0.2207742
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## 117	-0.779416438	-0.70733677	-0.2207742
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## 119	0.253778509	-0.44922235	-0.2207742
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## 121	0.253778509	1.78776935	0.1364656
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## 124	0.253778509	-0.27714606	-0.2207742
## 125	0.253778509	0.23908279	-0.2207742
## 126	0.253778509	4.36891361	-0.2207742
## 127	0.253778509	-0.79337492	-0.2207742
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## 133	0.253778509	-1.30960377	-0.2207742
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## 135	-1.812611385	0.92738793	-0.2207742
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## 137	-1.812611385	0.66927350	0.1364656
## 138	-0.004520228	1.44361678	-0.2207742
## 139	0.253778509	-1.30960377	-0.2207742
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## 141	0.253778509	0.92738793	-0.2207742
## 142	0.253778509	-1.30960377	-0.2207742
## 143	-2.070910121	-0.10506978	1.5654246
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## 145	0.253778509	-0.27714606	-0.2207742
## 146	0.253778509	-0.27714606	-0.2207742
## 147	-1.554312648	-0.44922235	-0.2207742
## 148	0.253778509	0.23908279	-0.2207742
## 149	0.253778509	-1.30960377	-0.2207742
## 150	-2.070910121	1.09946421	1.2081849
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## 163	0.253778509	-0.79337492	-0.2207742
## 164	0.253778509	3.85268476	-0.2207742
## 165	-1.941760753	0.08421413	0.4937053
## 166	-1.554312648	-0.10506978	-0.2207742
## 167	0.253778509	0.23908279	-0.2207742
## 168	0.253778509	1.61569306	-0.2207742
## 169	0.253778509	-0.44922235	-0.2207742
## 170	-1.296013911	0.27349805	0.1364656
## 171	0.253778509	1.09946421	-0.2207742
## 172	0.253778509	-0.27714606	-0.2207742
## 173	0.253778509	0.06700651	-0.2207742
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## 188	0.253778509	2.64815077	-0.2207742
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## 274	0.253778509	0.75531164	-0.2207742
## 275	0.253778509	-0.10506978	-0.2207742
## 276	-1.812611385	-0.10506978	0.4937053
## 277	0.253778509	1.66731595	-0.2207742
## 278	0.253778509	-1.30960377	-0.2207742
## 279	-2.070910121	1.61569306	0.1364656
## 280	0.253778509	1.44361678	-0.2207742
## 281	0.253778509	1.61569306	-0.2207742
## 282	0.253778509	0.23908279	-0.2207742
## 283	0.253778509	1.09946421	-0.2207742
## 284	0.253778509	-1.30960377	-0.2207742
## 285	0.253778509	-1.30960377	-0.2207742
## 286	0.253778509	0.06700651	-0.2207742
## 287	0.253778509	-0.79337492	-0.2207742
## 288	-1.554312648	-1.30960377	0.4937053
## 289	0.253778509	-0.79337492	-0.2207742
## 290	0.253778509	2.13192192	-0.2207742
## 291	0.253778509	0.06700651	-0.2207742
## 292	-1.037715175	-0.44922235	-0.2207742
## 293	0.253778509	1.09946421	-0.2207742
## 294	0.253778509	-1.30960377	-0.2207742
## 295	0.253778509	-0.10506978	-0.2207742
## 296	0.253778509	0.06700651	-0.2207742
## 297	0.253778509	0.66927350	-0.2207742
## 298	0.253778509	-0.44922235	-0.2207742
## 299	0.253778509	0.75531164	0.8509451
## 300	0.253778509	-0.79337492	-0.2207742
## 301	0.253778509	-0.10506978	-0.2207742
## 302	-0.262818965	-1.30960377	-0.2207742
## 303	-2.135484805	0.23908279	5.4950619
## 304	0.253778509	0.23908279	-0.2207742
## 305	0.253778509	-0.27714606	-0.2207742
## 306	0.253778509	-0.44922235	-0.2207742
## 307	0.253778509	-1.30960377	-0.2207742
## 308	0.253778509	1.27154049	-0.2207742
## 309	-2.070910121	1.85659986	-0.2207742
## 310	0.253778509	1.44361678	-0.2207742
## 311	0.253778509	-0.27714606	-0.2207742
## 312	0.253778509	-0.44922235	-0.2207742
## 313	0.253778509	-1.30960377	-0.2207742
## 314	-0.779416438	-0.27714606	-0.2207742
## 315	0.253778509	1.09946421	-0.2207742
## 316	0.253778509	-0.79337492	-0.2207742
## 317	0.253778509	-1.30960377	-0.2207742
## 318	0.253778509	0.06700651	-0.2207742
## 319	0.253778509	2.13192192	-0.2207742
## 320	0.253778509	-1.30960377	-0.2207742

## 321	0.253778509	-0.10506978	-0.2207742
## 322	-1.296013911	1.46082441	-0.2207742
## 323	-0.521117701	0.41115907	0.1364656
## 324	0.253778509	1.09946421	-0.2207742
## 325	0.253778509	-0.27714606	-0.2207742
## 326	-0.004520228	-1.30960377	-0.2207742
## 327	-2.070910121	-0.51805286	0.1364656
## 328	0.253778509	0.23908279	-0.2207742
## 329	0.253778509	2.30399820	-0.2207742
## 330	0.253778509	-0.10506978	-0.2207742
## 331	-1.037715175	-0.44922235	-0.2207742
## 332	0.253778509	-0.27714606	-0.2207742
## 333	0.253778509	-1.30960377	-0.2207742
## 334	-1.296013911	-0.10506978	-0.2207742
## 335	0.253778509	-0.44922235	-0.2207742
## 336	0.253778509	1.09946421	-0.2207742
## 337	0.253778509	-1.30960377	-0.2207742
## 338	0.253778509	1.09946421	-0.2207742
## 339	-0.521117701	-1.30960377	-0.2207742
## 340	0.253778509	-0.27714606	-0.2207742
## 341	0.253778509	-0.27714606	-0.2207742
## 342	0.253778509	0.75531164	-0.2207742
## 343	0.253778509	-0.79337492	-0.2207742
## 344	0.253778509	-1.30960377	-0.2207742
## 345	0.253778509	0.06700651	-0.2207742
## 346	-0.521117701	-0.27714606	-0.2207742
## 347	0.253778509	-0.79337492	-0.2207742
## 348	0.253778509	-0.10506978	-0.2207742
## 349	0.253778509	2.13192192	-0.2207742
## 350	0.253778509	0.06700651	-0.2207742
## 351	0.253778509	-0.27714606	-0.2207742
## 352	0.253778509	0.75531164	-0.2207742
## 353	0.253778509	0.06700651	-0.2207742
## 354	0.253778509	1.61569306	-0.2207742
## 355	0.253778509	0.06700651	-0.2207742
## 356	0.253778509	1.06504895	-0.2207742
## 357	0.253778509	-1.30960377	-0.2207742
## 358	-1.037715175	0.23908279	-0.2207742
## 359	0.253778509	-0.79337492	-0.2207742
## 360	0.253778509	0.23908279	-0.2207742
## 361	-0.262818965	0.75531164	-0.2207742
## 362	-1.037715175	-1.30960377	-0.2207742
## 363	0.253778509	-0.10506978	-0.2207742
## 364	0.253778509	-0.44922235	-0.2207742
## 365	0.253778509	-1.30960377	-0.2207742
## 366	0.253778509	1.44361678	-0.2207742
## 367	0.253778509	0.75531164	-0.2207742
## 368	0.253778509	-0.44922235	-0.2207742
## 369	0.253778509	-1.30960377	-0.2207742
## 370	0.253778509	0.75531164	-0.2207742
## 371	0.253778509	-1.30960377	-0.2207742
## 372	0.253778509	-0.10506978	-0.2207742
## 373	-1.296013911	0.92738793	7.6385005
## 374	-1.037715175	0.41115907	-0.2207742

## 375	0.253778509	-0.79337492	1.5654246
## 376	0.253778509	-1.30960377	-0.2207742
## 377	0.253778509	-1.30960377	-0.2207742
## 378	-2.200059490	-1.30960377	-0.2207742
## 379	0.253778509	-0.79337492	-0.2207742
## 380	-1.554312648	1.44361678	-0.2207742
## 381	0.253778509	0.06700651	1.9226644
## 382	0.253778509	-0.10506978	-0.2207742
## 383	-0.004520228	0.06700651	1.9226644
## 384	0.253778509	-0.10506978	-0.2207742
## 385	0.253778509	-0.27714606	-0.2207742
## 386	-1.554312648	-0.31156132	-0.2207742
## 387	0.253778509	0.41115907	-0.2207742
## 388	0.253778509	-0.27714606	-0.2207742
## 389	0.253778509	0.06700651	-0.2207742
## 390	0.253778509	-0.44922235	-0.2207742
## 391	0.253778509	0.75531164	-0.2207742
## 392	0.253778509	-1.30960377	-0.2207742
## 393	0.253778509	-0.27714606	-0.2207742
## 394	0.253778509	-0.44922235	-0.2207742
## 395	0.253778509	-0.10506978	-0.2207742
## 396	-0.262818965	-1.30960377	-0.2207742
## 397	0.253778509	-1.30960377	-0.2207742
## 398	0.253778509	-0.44922235	-0.2207742
## 399	0.253778509	0.41115907	-0.2207742
## 400	0.253778509	-0.27714606	-0.2207742
## 401	0.253778509	-0.27714606	-0.2207742
## 402	-0.262818965	0.92738793	0.1364656
## 403	0.253778509	-0.10506978	-0.2207742
## 404	0.253778509	-0.44922235	-0.2207742
## 405	0.253778509	-1.30960377	-0.2207742
## 406	0.253778509	1.61569306	-0.2207742
## 407	-1.296013911	-1.30960377	-0.2207742
## 408	0.253778509	0.23908279	-0.2207742
## 409	0.253778509	-0.27714606	-0.2207742
## 410	0.253778509	0.41115907	-0.2207742
## 411	0.253778509	0.23908279	-0.2207742
## 412	0.253778509	2.47607448	-0.2207742
## 413	0.253778509	-0.79337492	5.4950619
## 414	0.253778509	-1.30960377	-0.2207742
## 415	0.253778509	-0.44922235	-0.2207742
## 416	0.253778509	0.75531164	-0.2207742
## 417	0.253778509	-1.30960377	-0.2207742
## 418	0.253778509	-0.79337492	-0.2207742
## 419	0.253778509	-0.10506978	-0.2207742
## 420	0.253778509	-0.79337492	-0.2207742
## 421	0.253778509	0.92738793	-0.2207742
## 422	0.253778509	-0.44922235	-0.2207742
## 423	0.253778509	2.30399820	-0.2207742
## 424	0.253778509	1.27154049	-0.2207742
## 425	0.253778509	-0.79337492	-0.2207742
## 426	0.253778509	-1.30960377	-0.2207742
## 427	0.253778509	2.13192192	-0.2207742
## 428	0.253778509	-0.10506978	-0.2207742

## 429	0.253778509	-1.30960377	-0.2207742
## 430	-1.037715175	0.23908279	-0.2207742
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## 432	-1.037715175	0.66927350	0.4937053
## 433	0.253778509	-1.30960377	-0.2207742
## 434	0.253778509	-0.10506978	-0.2207742
## 435	0.253778509	-0.10506978	-0.2207742
## 436	0.253778509	1.44361678	-0.2207742
## 437	0.253778509	-1.30960377	-0.2207742
## 438	0.253778509	-1.30960377	1.2081849
## 439	0.253778509	1.44361678	-0.2207742
## 440	-0.262818965	-0.44922235	2.2799041
## 441	0.253778509	-0.27714606	-0.2207742
## 442	0.253778509	-0.79337492	-0.2207742
## 443	0.253778509	-1.30960377	-0.2207742
## 444	0.253778509	-0.27714606	-0.2207742
## 445	0.253778509	0.23908279	-0.2207742
## 446	0.253778509	-1.30960377	-0.2207742
## 447	0.253778509	-1.30960377	-0.2207742
## 448	0.253778509	1.27154049	1.9226644
## 449	0.253778509	-0.10506978	-0.2207742
## 450	0.253778509	0.75531164	-0.2207742
## 451	-1.296013911	0.92738793	1.5654246
## 452	-1.812611385	0.23908279	-0.2207742
## 453	0.253778509	0.75531164	-0.2207742
## 454	-1.554312648	-0.79337492	-0.2207742
## 455	0.253778509	0.41115907	-0.2207742
## 456	-2.019250374	1.66731595	0.1364656
## 457	-1.037715175	-0.10506978	11.5681378
## 458	0.253778509	-0.10506978	-0.2207742
## 459	0.253778509	-0.10506978	-0.2207742
## 460	-0.779416438	-1.30960377	-0.2207742
## 461	0.253778509	-1.30960377	-0.2207742
## 462	0.253778509	-0.44922235	-0.2207742
## 463	-1.296013911	0.41115907	-0.2207742
## 464	-0.779416438	1.78776935	-0.2207742
## 465	0.253778509	-1.30960377	-0.2207742
## 466	-1.864271132	-0.51805286	6.9240209
## 467	0.253778509	-0.79337492	-0.2207742
## 468	0.253778509	-0.79337492	-0.2207742
## 469	-1.941760753	-0.12227741	-0.2207742
## 470	0.253778509	0.23908279	-0.2207742
## 471	0.253778509	-0.79337492	-0.2207742
## 472	0.253778509	0.92738793	-0.2207742
## 473	0.253778509	0.06700651	-0.2207742
## 474	0.253778509	1.44361678	-0.2207742
## 475	0.253778509	-1.30960377	-0.2207742
## 476	0.253778509	-0.44922235	-0.2207742
## 477	-1.554312648	-0.44922235	-0.2207742
## 478	0.253778509	0.06700651	-0.2207742
## 479	-0.521117701	-0.31156132	-0.2207742
## 480	-1.812611385	0.06700651	3.3516234
## 481	0.253778509	-1.30960377	-0.2207742
## 482	0.253778509	-0.44922235	-0.2207742

```
## 483    0.253778509    1.44361678    -0.2207742
## 484    0.253778509    1.61569306    -0.2207742
## 485    0.253778509    0.41115907    -0.2207742
## 486    0.253778509    0.92738793    -0.2207742
## 487    0.253778509    -0.27714606    -0.2207742
## 488    0.253778509    -0.44922235    -0.2207742
## 489    0.253778509    -0.44922235    -0.2207742
## 490    0.253778509    -0.10506978    -0.2207742
## 491    0.253778509    -0.44922235    -0.2207742
## 492    0.253778509    -0.79337492    -0.2207742
## 493    0.253778509    0.23908279    -0.2207742
## 494    0.253778509    3.68060847    -0.2207742
## 495    0.253778509    0.06700651    -0.2207742
## 496    -1.812611385    0.75531164    1.2081849
## 497    0.253778509    -1.30960377    -0.2207742
## 498    0.253778509    -0.10506978    -0.2207742
## 499    0.253778509    0.41115907    -0.2207742
## 500    0.253778509    -0.44922235    -0.2207742
## attr("scaled:center")
##      Distance.mi.    Temperature.F.    Wind_Chill.F.    Humidity...
##      0.175702      62.929800      61.675000      64.284000
##      Pressure.in.    Visibility.mi.    Wind_Speed.mph.    Precipitation.in.
##      29.219520      9.017500      7.610600      0.006180
## attr("scaled:scale")
##      Distance.mi.    Temperature.F.    Wind_Chill.F.    Humidity...
##      0.61410804      19.02196210      21.20269283      23.15243864
##      Pressure.in.    Visibility.mi.    Wind_Speed.mph.    Precipitation.in.
##      1.26446459      3.87148622      5.81137607      0.02799241
```

```
as.matrix(scale.num)%*%fact.load.num%*%solve(t(fact.load.num)%*%fact.load.num)
```

```
##      PC1      PC2      PC3      PC4
## 1 -0.7075876685 -1.482327e-02 0.269935363 -0.6967047149
## 2 -1.7121365757 -1.844247e-01 0.225751051 -0.0215835716
## 3 -1.3260273823 4.533234e-01 0.341188753 0.2921748550
## 4 -0.1299404855 9.585624e-01 -0.622450461 0.5295759258
## 5 0.3715418993 -5.940203e-02 0.464664745 -0.8050258262
## 6 1.5548759963 1.046323e+00 -0.206113596 -0.3768002067
## 7 2.6136722264 -5.319935e-01 0.771936451 -0.3704750273
## 8 -0.7651284923 3.830730e-02 0.309552667 -0.7436426674
## 9 1.0288510870 -4.095678e-01 -1.260465076 0.9800498821
## 10 0.6121435856 -4.740007e-01 0.057230746 -0.2893933003
## 11 -0.5901374921 -8.105506e-02 0.452613596 -0.1125149266
## 12 0.1185809044 2.936070e-01 0.536196280 -0.3072905164
## 13 -1.6357085730 -5.133351e-01 0.219628338 -0.9759128899
## 14 -1.5864077186 -6.906448e-01 0.263156971 -0.4158477549
## 15 1.4931977896 -1.519409e+00 -0.102238847 0.8694960225
## 16 0.0793539063 1.360161e+00 -2.316995660 -1.0857757999
## 17 0.2232991448 3.404437e-01 0.228075768 1.3884976581
## 18 0.8054133349 8.525205e-01 0.411403689 0.4605132855
## 19 -0.0123486341 -6.299878e-01 -0.095049713 -1.1936988121
## 20 0.8109810108 -5.502332e-01 0.409772900 0.6977485257
## 21 -0.1401946877 5.410841e-01 0.381900486 -0.6532527267
## 22 -0.2134887760 -1.410342e-01 0.427928146 -0.0338115768
```

```

## 23  0.5433008891 -1.076672e-01  0.503708620  1.1946405836
## 24 -0.5794661413  1.489479e-01  0.324871346 -0.1801821803
## 25 -0.2328863842 -3.629019e+00 -0.053992822  0.0486757890
## 26 -0.9540025804  3.137228e-01  0.372366276  0.7704746776
## 27 -0.1644934075  5.358822e-01 -0.744640090  0.5313055442
## 28  0.0150989364  2.929212e-01  0.240742330  1.5270682268
## 29 -0.1611332230  4.265582e-01  0.433329547  0.8643237389
## 30 -1.4519051905  1.669543e-01  0.330299648  0.0068088181
## 31 -0.1873743787 -2.886155e-01  0.357476169 -0.1541727095
## 32 -0.3477274350  1.640666e+00 -3.141602339  0.0344348723
## 33  1.3907534396  1.259691e+00  0.304958857  1.1971550536
## 34 -0.0521086166  2.138952e-01  0.218250629  1.6233325544
## 35 -0.5590280420  6.783081e-01  0.370331150  0.2995116471
## 36 -1.1088801030 -2.152695e+00 -0.230555493 -0.1763725997
## 37 -0.6164452225  6.568579e-01  0.366476423  0.2868705099
## 38  0.1176380222 -2.523113e-01  0.606494525 -0.4454513006
## 39 -0.0967555392 -1.917385e-01 -1.840855277  0.6425614056
## 40 -0.5519889467  6.722729e-01  0.364389305  0.1366635430
## 41 -1.2686053099  4.356902e-01  0.394424122 -0.8031515653
## 42  2.2840583018 -3.463381e-01  0.587468807 -0.2610668332
## 43  1.4474928895  7.744825e-01  0.165304337 -0.2122850361
## 44  0.1974917607 -2.295045e+00 -0.785879412  0.0646690726
## 45  0.0467919890  5.115978e-03  0.444776123  1.2353553163
## 46  1.2267531039  7.519453e-01  0.007375148  1.1774163881
## 47  0.6951661546 -5.697848e-01  0.345986014  1.2714074214
## 48 -1.5305512490 -1.215729e-01  0.284908184  0.5315646901
## 49 -1.1478324436  1.007179e-01  0.341407966 -0.3217747110
## 50  0.0918887052  5.244682e-01  0.410260370  1.4900009985
## 51 -1.2644957818  4.044877e-01  0.320938401 -1.2195236508
## 52  1.3830730908  2.756770e-02  0.491380575  0.7940279753
## 53 -0.5024897247  4.568425e-01  0.399312963  0.3539986161
## 54  1.9208384987  5.103132e-01 -0.744350669  0.4428388623
## 55 -0.7606657955 -9.136718e-02  0.337215194 -2.5353153151
## 56 -1.0325139382 -5.036437e+00  0.230332026  1.0438508452
## 57 -0.9592805455 -2.780924e-02  0.439633668 -0.3085858236
## 58  1.4703662059 -3.555993e-01  0.456379692 -1.0670886843
## 59  1.5262506779 -1.331988e+00  0.127798714  0.5870920390
## 60 -0.7284949603 -4.897568e-01  0.340471076  0.5509776652
## 61  2.1772343195 -2.949640e+00 -0.133262203 -0.2257330028
## 62  1.6872141947 -2.101162e-02  0.490903610  0.7238789094
## 63  0.9315536251 -2.723487e-01  0.149508193 -1.0188039911
## 64 -0.3886821508  3.527413e-01  0.405828774 -1.0377049247
## 65  1.4339046255  9.528973e-01  0.233980320 -0.0754750611
## 66  0.3898177385  2.131810e-01  0.512879240  1.2763203136
## 67  1.9177353537  1.369763e+00  0.413045141 -0.5574461076
## 68 -0.1509421647 -2.359953e+00 -0.481737002 -0.3941369451
## 69  0.4164765132 -4.655485e-02  0.351937270 -0.1189930925
## 70 -1.0287472922 -6.787296e-01  0.215170091 -0.2446384983
## 71  0.6646543763  1.324537e-01 -1.622348336 -2.3570508556
## 72 -0.4432845450  6.811446e-01  0.344401551  1.0395440008
## 73 -0.6133172400  5.303390e-01 -0.512298009  0.3258445672
## 74 -0.1854545500  7.037211e-01  0.385433721 -0.6692514245
## 75  2.1313568180  2.712349e-01  0.691042684 -3.2975798923
## 76  1.4311654330  1.173949e+00 -0.167910544  0.6920502441

```

```

## 77 -0.7678741226 5.178532e-01 0.365322955 0.5499649105
## 78 0.3385949970 4.345741e-01 0.482189029 1.3955384201
## 79 -1.0718603619 -2.524645e+00 -0.405847555 -0.2290518835
## 80 -1.1056319022 -1.920915e+00 -7.054508417 0.5546678815
## 81 -0.8600308809 1.669423e-01 0.385028165 -0.3090564413
## 82 -0.0556401637 1.276309e-01 0.379161932 -0.8560987281
## 83 0.7932308765 1.434992e+00 -1.549677993 1.2315935857
## 84 -0.5198248461 6.897184e-01 0.355710675 1.0131208363
## 85 -0.2368765073 4.054455e-02 0.307223723 -0.6469748150
## 86 -1.1437767265 2.196395e-01 0.296880693 -0.0415029310
## 87 2.1944036572 1.304814e-01 0.197756170 1.1615793978
## 88 1.0703396218 6.239200e-01 -6.861223777 -0.5942388547
## 89 0.8644033625 1.574840e+00 0.152630035 1.3382317604
## 90 0.9901996474 1.259250e-01 0.542945533 -1.4482460943
## 91 -0.6721322718 1.311529e-01 0.029041237 -0.0466744352
## 92 -0.5551743787 6.127031e-01 -0.230966559 -0.0328977277
## 93 -0.5157261657 3.337641e-01 0.416761504 0.1095204441
## 94 -0.3886441949 1.552306e+00 -1.363653626 1.4982789224
## 95 0.1943528345 2.536209e-01 0.401813672 0.9062925668
## 96 1.2752089153 -4.919907e-01 0.268072989 -0.3322541965
## 97 -1.1095325704 -7.526722e-02 0.391084120 0.2280184638
## 98 1.5717852396 9.166371e-01 -1.282822004 0.5605405893
## 99 2.1131266737 -3.062952e+00 -0.228028757 0.8902956585
## 100 -0.5965019051 4.334759e-01 0.411375755 -0.1997166571
## 101 -1.3514250187 3.373154e-01 0.308301923 0.8020772075
## 102 -1.1704724355 6.712381e-02 0.379552294 -0.3933910593
## 103 1.0015126051 -1.094105e+00 0.183658241 -0.8650757606
## 104 -0.9109858832 5.199459e-01 0.340580927 -0.6310785271
## 105 -0.9517241574 -3.675015e-02 0.466643359 -0.1791912827
## 106 -1.3088057257 -3.370972e-01 0.128639456 -1.5725604183
## 107 -0.1220111234 -3.922512e-03 -0.501470318 1.2408791995
## 108 -0.1482865669 -4.496253e-01 0.441675622 0.5220899504
## 109 0.0775310063 2.685522e-01 0.589160701 0.1108074701
## 110 0.4138807680 -2.168628e+00 -0.326945842 -0.0896914891
## 111 -1.1506912731 -2.307122e+00 -0.307611831 -0.3555540411
## 112 0.0193298943 -1.041657e-01 0.438426093 0.6871925167
## 113 -0.5142931047 -9.922637e-02 0.219445420 0.0591520726
## 114 -0.4210225294 -5.895726e-01 -0.429776809 -0.7158871631
## 115 -1.3587352205 4.196576e-01 0.322033538 0.3012476605
## 116 0.0199830237 3.461208e-01 0.445744738 0.5069478683
## 117 0.8542792536 9.059632e-01 0.480472782 0.6460292053
## 118 0.1204280745 -1.357773e+00 0.024619610 0.8248512487
## 119 0.3052324683 2.673725e-01 0.592762071 0.3153764263
## 120 -0.5103167587 4.479025e-01 0.370731509 0.3903772353
## 121 1.0704829385 9.770436e-02 -0.247514601 -1.6024842596
## 122 0.4376565386 4.950918e-01 0.525588250 0.3513135601
## 123 -0.0509626174 9.131519e-02 0.403302817 -0.7334660805
## 124 -0.1719006719 6.769905e-02 0.471740767 0.1599500701
## 125 0.6855055090 -2.180888e-02 0.675686170 -0.5373595129
## 126 1.0425385426 -1.705916e-01 0.395948367 -4.2227788032
## 127 0.1360443232 -2.049354e+00 -0.158225076 0.8283557025
## 128 -0.2259162459 9.580240e-01 -0.268603752 1.2852276816
## 129 -0.9865542249 -3.118229e-01 -0.330515331 -0.9808345744
## 130 -0.4782776393 1.143918e+00 -0.096571827 0.3018402677

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## 131 -1.1021263730 -2.939148e-03 0.258120457 -1.7663078494
## 132 0.3185120151 5.068694e-01 0.466316865 0.4202442258
## 133 -0.3364971386 6.950164e-01 0.386632860 1.5137401425
## 134 -1.5412216390 3.733987e-01 0.306037736 -1.5989968372
## 135 0.7735091321 1.280708e+00 0.109696745 -0.7306676578
## 136 -0.2020280288 -1.018740e+00 -0.616572053 0.6684378955
## 137 1.4894440569 2.066804e-01 -4.097752289 -0.5588098954
## 138 0.8494641015 6.423541e-01 0.512797819 -1.3202170468
## 139 -0.5703045610 7.008351e-01 0.325526269 1.5629804045
## 140 -0.5784460158 -3.992817e-01 0.239282652 0.2461980115
## 141 0.1192667304 -2.214717e+00 -0.187588819 -0.8984916225
## 142 -0.6418966699 6.909740e-01 0.362548040 1.4934167277
## 143 0.3168415583 9.499978e-01 -2.665228410 0.1574849234
## 144 -1.2150063750 7.741511e-01 0.219015390 0.1219443018
## 145 -0.9997348802 -2.614143e-01 0.457421633 -0.0892272113
## 146 -1.8088323160 -1.253703e-01 0.319973579 0.0186151536
## 147 0.2517568868 1.200372e+00 0.090650487 0.6433197343
## 148 -1.8630270908 -1.739379e-01 0.212412319 -0.3655025233
## 149 -1.3483525418 -1.309236e-01 -0.888647114 1.3035314722
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## 155 -0.3401005254 -2.197527e+00 -0.219276202 -0.9267658204
## 156 0.0875799391 -2.984988e+00 -0.311055792 1.1958629971
## 157 -1.0237810935 -3.968507e-01 0.289379455 -0.2436290547
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## 159 0.7741298116 1.237086e+00 0.259708587 1.3570561920
## 160 0.3562683297 2.804772e-01 0.379196869 0.6366945136
## 161 1.9763371400 -3.293266e-01 0.516780619 -1.0763871079
## 162 -0.0339646434 1.825787e-01 0.360201720 1.4102968077
## 163 0.1850160666 -5.891615e-02 0.607241854 0.4903662391
## 164 0.8600488592 -3.474705e-02 0.582548388 -3.9607443617
## 165 1.1167728384 1.455003e+00 -0.157958171 -0.1086136076
## 166 0.9238716366 8.032407e-01 0.069316499 0.3002989750
## 167 0.4530019330 -1.265435e+00 0.166723203 -0.3085025595
## 168 0.2898218591 4.024365e-01 0.452049377 -1.4776413597
## 169 0.3708178006 2.628122e-01 0.493932592 0.4673842904
## 170 1.2593999085 9.388093e-01 0.056111303 -0.1873262382
## 171 -0.3498618992 2.593399e-02 0.394822948 -1.1390750583
## 172 -1.6561064437 2.727049e-01 0.333253985 0.1772825971
## 173 -1.8453568439 -1.801182e-01 0.203053677 -0.1809404763
## 174 -0.0640707387 5.142409e-01 0.430009811 1.4303927763
## 175 -0.7924802120 1.022093e+00 0.251035283 -2.0352668461
## 176 -0.8212756061 3.509896e-01 0.332304102 0.0137999722
## 177 -0.0924208773 5.974202e-01 0.412162034 -0.7317760998
## 178 0.0554299184 6.405910e-01 -0.019071355 -2.6488190026
## 179 1.1414923806 1.287589e+00 -0.461569118 0.5299229126
## 180 0.1528986047 1.062651e+00 0.088026933 0.2368469749
## 181 1.4985190378 -1.681714e+00 -0.007808448 0.6447310359
## 182 -0.1809625017 4.794429e-01 0.423307345 -3.3632297837
## 183 0.6826342432 -1.897642e+00 -0.137180904 0.5851975638
## 184 1.4377716962 -9.722153e-01 -0.550077737 -0.5241555695

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## 185 0.3079837694 -1.722297e-02 -1.727783677 0.4306192891
## 186 -0.8985213230 2.282352e-01 0.408666413 -1.3486200796
## 187 1.3268865556 -5.615007e-01 0.550528837 0.0298774463
## 188 -0.6325662820 1.083827e-01 0.456011042 -2.7784384055
## 189 -0.5440204713 -1.441193e-01 0.223546844 -0.6503620384
## 190 -0.7766850169 5.125170e-01 0.335513498 0.2486203276
## 191 1.9189256738 1.017034e+00 0.427255394 -0.4008952873
## 192 -1.5002802113 -2.239886e-01 0.254865450 -1.0634786518
## 193 -0.5484907216 5.639521e-01 0.411235949 0.5397700827
## 194 -0.1874828551 1.068728e+00 0.202641365 -1.1368724399
## 195 -0.2038683902 -6.251351e-02 0.437762570 0.3241973049
## 196 -0.7037269882 4.198865e-01 0.420440607 -2.4511498785
## 197 -1.2302887758 3.569977e-01 0.340221303 0.7848039809
## 198 -1.0240279196 -3.418772e-01 0.366961986 0.5172281261
## 199 -0.6217725967 -5.646975e-01 0.238033531 -4.0809312140
## 200 0.7641270651 -2.638556e-02 0.687025725 0.1441326889
## 201 1.8910475722 1.181246e+00 0.079462817 -1.8439567254
## 202 0.9058191220 1.041251e+00 0.404445757 -0.2651906649
## 203 -0.6195822647 -5.878068e-03 0.196064863 -0.0605452544
## 204 1.9919493859 -4.426942e-01 0.447900336 -0.3152601075
## 205 0.9525068862 9.235043e-01 -1.050254018 -0.9091217449
## 206 -0.1429092390 -1.613405e-01 0.261143438 0.2109124349
## 207 -1.4708677671 -8.545133e-02 -0.553044243 0.1381800504
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## 209 0.5156163965 2.894313e-01 0.497686190 0.5211945750
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## 212 -0.8052624222 -2.187703e-01 -1.924340958 0.0934993647
## 213 -0.2207847849 -2.597947e+00 -0.434191628 0.4439364367
## 214 -1.2467532566 4.543090e-01 0.321756495 -0.8580047020
## 215 -0.5051086168 5.762362e-01 0.242588997 0.9844168852
## 216 -0.7229229903 3.669861e-02 0.363291272 1.2298982160
## 217 -0.6251906791 4.647917e-02 0.369023670 0.3907501909
## 218 1.5827709666 6.092918e-01 0.141964051 -0.3895061460
## 219 0.1008595214 -3.455252e-01 -0.011805153 -2.0416721106
## 220 -1.0063639340 7.100189e-01 0.277036524 -1.1008515361
## 221 -1.0864515638 -1.335125e+00 0.024199982 1.1338230161
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## 223 -1.3466970287 3.587931e-01 0.297517104 -0.8768518538
## 224 -0.0574027088 -1.117983e+00 -4.289593209 0.3655258148
## 225 0.4095606371 -6.463937e-01 0.429381077 -3.0144337697
## 226 0.3027988923 1.036965e+00 0.053685320 0.8785040646
## 227 0.5516405030 -9.673648e-02 0.406898664 1.3395991814
## 228 0.2620689476 -6.549919e-02 0.470541320 0.6981266205
## 229 0.8447866852 4.630819e-01 0.102789727 -0.1258466048
## 230 0.4398531304 1.261032e+00 -0.477937375 -0.1453020459
## 231 -1.1835520536 -5.272445e-01 0.360345623 0.4284905271
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## 234 0.5162277309 -1.403774e-01 0.415439212 0.7935181857
## 235 -1.0085433650 3.391891e-01 0.346690035 1.3185792124
## 236 -0.3284110122 6.568963e-02 0.280623097 1.4289502974
## 237 -0.0242568430 1.056631e-01 0.518993270 -0.5491892705
## 238 0.9316390178 -4.537727e+00 0.342028375 0.3940601290

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## 239 -0.0869466725 2.348909e-01 0.516812582 0.3437271300
## 240 0.1031799365 -1.008937e-01 0.422746886 0.3849944170
## 241 -1.0554303138 9.975540e-01 -0.371891341 0.0465978027
## 242 -0.4991033374 -6.600295e-02 0.441984485 0.6058034843
## 243 0.4093478490 -9.219804e-02 0.649449807 -1.5967009520
## 244 -1.1444388325 -4.740783e-01 -0.378759856 0.1245074086
## 245 -0.9003191061 1.035499e-01 0.368671270 0.1944107883
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## 248 -0.3333636721 5.146048e-01 0.376628564 -0.0728556703
## 249 0.4468535252 6.534521e-01 0.235272409 0.5062643149
## 250 -1.2225881127 5.200612e-01 0.287983695 -0.7802114716
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## 265 -0.4901418943 -2.103095e-01 0.413842687 0.5931229497
## 266 -0.3247150467 7.840522e-01 0.377917828 1.4564921167
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## 268 -1.0476627586 -4.532383e-02 0.224239320 -1.3834017283
## 269 -0.8479897824 -7.651775e-03 0.375840518 -1.2116889233
## 270 0.3518661421 3.297774e-01 0.514970693 0.4591941341
## 271 0.7679864528 -8.382158e+00 1.410321115 0.7084438351
## 272 0.1539248376 3.149948e-02 0.465191199 0.3246920088
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## 274 -0.8345754263 -2.034662e-01 0.276599965 -0.8001069903
## 275 -0.5605251880 3.485252e-01 0.223795028 0.3850414689
## 276 0.4022722146 1.394917e+00 -0.223749437 0.1004405954
## 277 1.7741907551 9.355518e-02 0.620551725 -1.6458956932
## 278 -0.1265302909 5.777003e-01 0.353636367 1.4398125280
## 279 2.6275921664 7.242851e-01 0.146568190 -1.8055414774
## 280 -1.0300629838 1.327329e-03 0.347718099 -1.5403581874
## 281 1.2311029366 -2.932787e-01 0.202761131 -1.2268683190
## 282 1.3693287384 -2.432107e-01 0.676918456 -0.5063910373
## 283 -0.9090909016 5.509246e-01 0.342221730 -0.9620398360
## 284 -0.6598419574 -1.312444e-03 0.417205209 1.1489114242
## 285 0.3174783509 3.243049e-01 0.381690727 1.4946605581
## 286 0.3824584239 1.454321e-01 -0.061068591 -0.0798988518
## 287 -1.3414852105 -2.686181e-01 0.455943786 0.3613748218
## 288 2.0885264397 -8.725671e-01 -0.596514671 1.3698174377
## 289 -0.2317009543 -4.224090e-02 0.552467102 0.5025948709
## 290 -0.7739685152 -2.102930e+00 -0.197688922 -2.1902911805
## 291 -1.2672936254 9.192571e-02 0.374232695 -0.2229275451
## 292 -1.2055203819 9.642929e-01 0.213469017 0.3331444586

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## 293 0.1341984986 -1.949524e-01 0.505727285 -1.2977984779
## 294 -0.2261233795 -7.943099e-01 0.431496275 0.9033557528
## 295 -0.0845811222 -5.224052e-01 0.054235915 -0.1684144223
## 296 -0.5965414646 7.495297e-02 0.417377370 -0.1740614269
## 297 1.9369350956 1.628458e-01 0.764363158 -0.8095439534
## 298 0.0823465901 2.403030e-01 0.332297954 0.6410100974
## 299 0.6671272592 4.729952e-01 -0.227981567 -0.5281664073
## 300 0.3126698599 -1.316549e-01 0.432563374 0.7365476462
## 301 0.7000075247 -2.162639e-01 0.671998950 -0.2596689579
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## 304 0.4526434046 5.371454e-01 0.489427038 -0.0890833803
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## 308 -0.4144745371 3.876211e-01 0.424203745 -1.2257770386
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## 315 -0.6902895181 -3.446944e-02 0.129654820 -0.8398936840
## 316 -1.6382400229 -8.973077e-01 0.106789916 0.5734554387
## 317 1.1459958189 2.294307e-01 0.609391306 1.2759273023
## 318 2.1793546937 -4.046745e-01 0.652291628 -0.2230227391
## 319 -1.5003313973 -1.275931e-01 0.199551913 -2.1396915510
## 320 -1.6546012221 -1.559378e+00 -0.103199092 1.0653622011
## 321 0.1654966575 1.484162e-01 -0.969506908 0.3293085487
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## 323 -0.3064148321 7.601498e-01 -0.023292042 -0.2112092803
## 324 -1.2940002597 3.030267e-01 -0.629927745 -0.9400146984
## 325 -0.9420063940 -8.612299e-02 0.329161137 0.1720141723
## 326 -0.0255875852 6.225210e-01 0.378642287 1.4465161323
## 327 1.7520041484 1.289109e+00 0.145815494 0.3697995969
## 328 0.2836732535 1.964691e-01 0.494179289 -0.2547709578
## 329 0.9177255861 -5.868991e-01 0.019804307 -2.4556646452
## 330 1.2861018261 -1.120402e+00 0.115765292 0.3005054893
## 331 -1.3604870666 5.750861e-01 0.171470521 0.2187875498
## 332 -1.3093580448 2.713225e-01 -0.490995258 0.3695460676
## 333 0.6556751569 -2.043619e-01 0.427479454 1.2873464663
## 334 0.7558946197 3.640339e-01 0.137077882 0.1123402917
## 335 -1.5119808316 4.402979e-02 0.251111275 0.4043213507
## 336 -0.1219283884 -1.699924e+00 -0.350456220 -0.8398065920
## 337 -1.1739790226 -1.127897e+00 -1.194300234 1.2910297791
## 338 -0.7076168176 -6.397096e-02 -0.183964720 -1.1699004141
## 339 0.0006412962 5.492584e-01 -0.079938108 1.3621428365
## 340 -0.3267638204 -6.089048e-01 -0.271291103 -0.1311433096
## 341 1.6648222244 -1.201301e+00 -2.552588641 0.3917145170
## 342 -1.3490550313 8.640813e-02 0.224604784 -0.7053262442
## 343 -0.0863061273 -2.312452e-01 -0.308585625 0.8148783236
## 344 0.1846216688 5.426321e-01 -0.001798156 1.4796230804
## 345 -1.1262011590 -8.234422e-01 0.275718884 -0.4037641585
## 346 -0.3061257814 1.021434e+00 0.240292036 0.5145855245

```



```

## 347 0.1495828420 -3.833291e-01 0.542595365 0.4541190662
## 348 0.3068007261 4.159491e-01 0.488136934 0.1819429359
## 349 0.1467613300 -3.506783e-01 -0.510978303 -2.0424054816
## 350 0.0679268208 3.815120e-01 0.484808836 -0.0384898514
## 351 -0.9573591556 6.477766e-01 0.330544318 0.4458149091
## 352 -1.7360567266 -8.239906e-02 -1.927283562 -0.6409801138
## 353 -1.7646318298 -2.776225e-01 0.143764357 -0.1184654631
## 354 0.1558599829 -2.910258e-01 0.506374061 -1.8424220781
## 355 -0.8345236005 -4.282365e-01 0.213589665 -0.1133162657
## 356 1.1970616683 -6.549312e-02 0.612329455 -1.1942269198
## 357 0.2354276529 1.289675e-01 0.300318175 1.5233072376
## 358 0.5864535632 3.094011e-01 0.139967790 -0.1772556900
## 359 0.2220024490 3.008126e-05 0.534095277 0.6244969979
## 360 0.1036126847 4.234922e-01 0.502530371 -0.2121657945
## 361 0.9594699802 4.969081e-02 0.362279097 -0.7319823403
## 362 0.4069036550 9.235396e-01 0.377898974 1.2149532141
## 363 -0.5911364523 -4.914946e-01 0.418217664 -0.2189210524
## 364 0.1556967435 5.051329e-02 0.450235247 0.4120711223
## 365 -0.2814681279 -7.929760e-01 0.382458632 0.9438229041
## 366 -0.3405162322 -3.690467e-02 0.126418825 -1.1156206193
## 367 -0.6145820018 1.765007e-01 0.438828270 -0.8509360941
## 368 -0.1132425971 4.836985e-01 0.383028255 0.6261077100
## 369 -1.3485828297 -1.075623e-01 0.332501133 1.1099613633
## 370 -0.3133571840 -3.284650e-01 0.320231975 -0.8191077802
## 371 -0.4005617137 5.114901e-02 0.536704154 1.0421927438
## 372 -0.3042619045 3.356774e-01 0.285657013 0.1535213581
## 373 -0.6648127030 2.334346e+00 -4.308870672 -1.1531782453
## 374 1.0666535812 6.728443e-01 0.185682663 -0.1973270407
## 375 0.4758248211 4.543032e-01 -0.550997119 0.7800236463
## 376 0.4577197079 1.364951e-02 0.349949539 1.4470194026
## 377 -0.0668558809 1.969561e-01 -0.118825367 1.3816610219
## 378 0.6139760121 1.498481e+00 0.111264639 1.3777844313
## 379 -0.1205523383 4.718528e-01 0.387398338 0.9547289742
## 380 1.4964884861 5.544770e-01 -0.838260601 -1.3246607698
## 381 0.4804278847 3.100635e-01 -0.893562728 0.0428429876
## 382 -0.4494575736 -9.478369e-02 0.531313469 -0.2063822289
## 383 0.8294844045 4.152518e-01 -0.882142269 -0.0050491321
## 384 -0.2412381437 -5.365219e-01 0.148441028 -0.0810567708
## 385 -0.9416785158 -2.122663e-01 -1.668980095 0.3532822801
## 386 0.9178016525 1.248509e+00 0.349935652 0.2639628142
## 387 -0.9849575477 1.794907e-01 0.359188711 -0.4593114082
## 388 -0.1466471313 -2.248426e-02 0.474912592 0.1255847252
## 389 -0.1699172662 3.514940e-01 0.149278381 0.1656327043
## 390 1.2173061438 -5.153463e-02 -0.376573618 0.6232360302
## 391 -1.6764267129 -1.037768e-01 0.213664573 -0.8190484798
## 392 -1.2142346054 9.071873e-02 0.386141517 1.1315044625
## 393 0.1401778724 6.142003e-01 0.485763287 0.4017632418
## 394 -0.1106614492 -2.303989e-02 0.613379290 0.1027028963
## 395 -0.3281696813 -4.473070e-01 0.377596224 -0.0976519365
## 396 -0.4453192719 8.950584e-01 0.287360844 1.5022133311
## 397 0.9611821313 -4.663808e-01 0.502609684 1.1332551361
## 398 -1.2150761760 1.916807e-01 0.271614361 0.4828058571
## 399 -0.1531723012 1.885628e-01 0.507838718 -0.5242423691
## 400 0.3692023639 -1.256613e-01 0.430887611 0.2401005505

```

```

## 401 0.3147217875 9.099113e-03 -0.170335020 0.4337436837
## 402 1.2642700583 -2.092692e+00 -0.781211992 -0.4887402061
## 403 -0.4441980758 4.062258e-02 0.424910893 -0.0009224949
## 404 -0.7694931058 3.714842e-01 0.405273022 0.4366363129
## 405 0.3711313732 4.312985e-01 0.495469995 1.3808737438
## 406 1.0197061806 -4.246052e-01 0.513240889 -1.7635622053
## 407 2.6980876989 -1.477529e+00 -0.258961036 1.5159948391
## 408 0.0147295182 -5.093158e-02 0.473842585 -0.3664507868
## 409 -1.1868009995 -2.064276e+00 -0.203264423 0.1449411573
## 410 0.1790159221 -4.633585e-01 0.348805579 -0.4845506693
## 411 -0.9041720609 6.270935e-01 0.357723281 -0.1028746368
## 412 -0.4376204769 -3.798474e-02 0.391110916 -2.5360916995
## 413 -0.3791768074 -1.274253e-01 -6.823412171 0.8721954667
## 414 -0.2677944670 -7.925023e-01 0.297468701 1.0896706970
## 415 -0.9439340743 -1.263386e-01 -0.936609020 0.5769332910
## 416 -1.6591613153 -5.826509e-01 -1.308874498 -0.6007972128
## 417 -0.0239428097 1.799615e-01 0.511169141 1.1937509940
## 418 -0.6190871646 6.138186e-02 0.401838570 0.6909247515
## 419 -0.2191166154 5.190544e-01 0.474862372 0.1481162644
## 420 0.7114110408 3.319101e-01 0.255315997 0.8694766622
## 421 -0.2398854456 4.435845e-01 0.435493210 -0.8495454135
## 422 -0.0069851374 6.689104e-02 0.383830419 0.4853945042
## 423 -1.2883449794 -1.747334e-01 -1.003723733 -2.2995946282
## 424 -1.8388272428 -3.360607e-01 0.228869724 -1.4685317508
## 425 1.2112244727 -6.003445e-02 0.618021090 0.6540560856
## 426 0.1407943999 -3.174921e+00 -0.307717586 1.1283023296
## 427 1.5017508183 -9.324366e-02 0.426844834 -1.9430611190
## 428 0.0489816153 9.264315e-02 0.418180676 0.1148318824
## 429 2.1363342452 -2.841941e-01 0.588097149 1.2850345185
## 430 1.9508989151 5.293451e-01 0.387713830 -0.2248257852
## 431 -0.1053530322 1.325633e-03 0.428637625 0.7194863226
## 432 1.0149486563 1.281644e+00 -0.040184796 -0.5570998604
## 433 -0.3369264829 -6.627683e-01 0.418429092 0.9526834121
## 434 -0.5045401106 -1.089130e-02 0.511855236 -0.1561821853
## 435 0.4224999946 -2.131159e+00 -0.048392726 0.0079884357
## 436 1.0433253989 -1.939063e+00 -0.394111626 -0.8458990514
## 437 0.3735734598 2.705798e-01 0.530911898 1.2693001796
## 438 0.1372243866 -7.110066e-01 -4.343741048 1.6533010802
## 439 -1.1911618946 -4.365533e-01 0.144369769 -1.4420061200
## 440 -0.4020770438 7.613466e-01 -1.218686320 0.5027107351
## 441 -0.2936587440 2.032541e-01 0.371153229 0.3348624291
## 442 1.7502691355 -1.197433e+00 0.028863217 1.0183126016
## 443 2.1076200316 -2.457903e+00 -0.249256884 1.6605040937
## 444 -0.8831416924 4.475486e-02 0.287191547 0.2923920363
## 445 -0.3303773873 2.759184e-01 0.430542780 -0.2405085221
## 446 1.3587869717 -2.095112e+00 -0.185109972 1.3863146829
## 447 -1.0904406075 -1.195207e-01 0.222695015 1.3086678067
## 448 0.8317496918 4.800698e-01 -0.724366753 -1.2759327211
## 449 -0.5110910855 5.265504e-02 0.431575216 -0.0176587104
## 450 -0.7973337501 6.045708e-01 0.355667353 -0.6007893928
## 451 0.9344236535 1.392796e+00 -0.639009376 -1.0030055741
## 452 2.1434626873 5.788521e-01 0.241624010 -0.2789667406
## 453 -1.4731043229 -4.524433e-01 0.235837321 -0.9476764271
## 454 -0.0164800872 1.287321e+00 0.157636286 0.8736243773

```

```

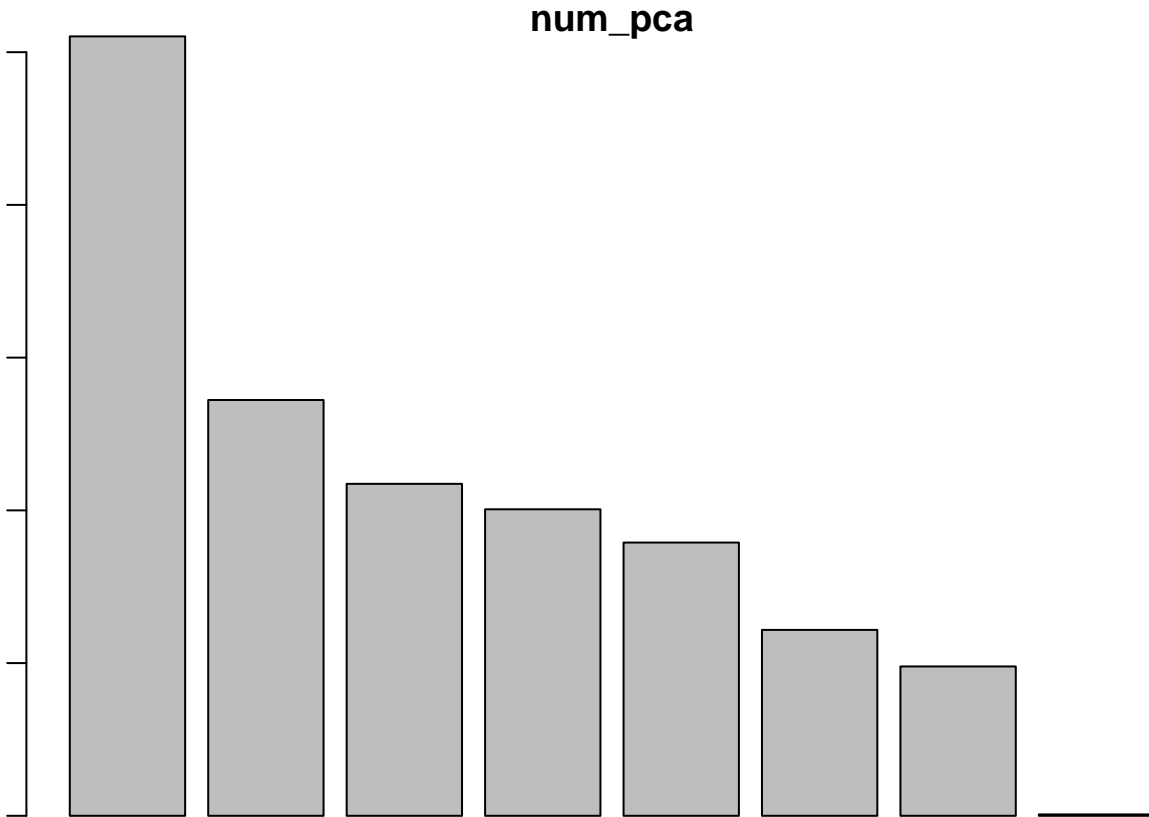
## 455 -1.1322226479 -2.350286e-01 0.246229542 -0.4797821472
## 456 1.9067538306 1.273524e+00 0.068325913 -1.6340346582
## 457 0.5013795974 2.194522e+00 -6.616074499 -0.3650802308
## 458 -0.6763070780 2.243738e-01 0.517064238 -0.1044750841
## 459 -0.4588575782 -2.474039e-01 0.449014207 -0.1474755475
## 460 -0.2049256113 8.654227e-01 0.276226750 1.3377943443
## 461 0.3970067430 1.858779e-01 0.567309977 1.1888692665
## 462 -1.4992534243 -7.698704e-02 0.256059094 0.3535071636
## 463 0.4398158658 1.393868e+00 0.250873710 -0.2270454075
## 464 1.8227884597 -1.517424e-01 -0.359742173 -1.7888798901
## 465 0.4706682022 1.499292e-01 0.553132047 1.2085305378
## 466 0.8538589720 2.171052e+00 -3.798395053 0.1596733452
## 467 0.3206341491 -5.775678e-01 0.513039801 0.4528993817
## 468 0.3237366663 2.788563e-01 0.524258850 0.7622646182
## 469 1.1407862603 1.571719e+00 0.317082689 0.1253225881
## 470 -1.1719335684 3.379683e-01 0.330009606 -0.2195613255
## 471 1.0714316767 -5.039092e-02 0.569542028 0.7030278420
## 472 -1.7639970078 -3.705675e+00 -6.977618318 -0.6045247743
## 473 -0.9920518797 5.719067e-01 -0.386568311 0.1408674224
## 474 -0.3688028525 -1.736433e-01 0.495899265 -1.7042987075
## 475 -1.0575252942 5.517138e-01 0.344717913 1.3934867842
## 476 1.0667081613 3.561821e-02 0.377042262 0.6668240348
## 477 2.7913523918 3.613024e-01 0.428163123 0.2718663691
## 478 0.1262131172 9.856333e-02 0.470387658 -0.1148942160
## 479 1.2159699295 6.361939e-01 0.467549996 0.3206448751
## 480 1.0209416501 1.266492e+00 -1.910220271 -0.1857800033
## 481 -1.0843083814 -7.084683e-02 0.384044849 1.0959588304
## 482 -0.5125151049 7.015641e-01 0.351340592 0.6844995721
## 483 -1.0237567071 6.586952e-01 0.325057737 -1.2571972720
## 484 3.2004462754 -5.626270e-01 0.746186859 -1.7871899264
## 485 -1.6853734437 -5.623053e-01 0.209488007 -0.6479057693
## 486 -1.3365928908 -1.505591e-01 0.364009250 -1.2074389793
## 487 0.0589980965 2.232973e-01 0.529128987 0.1768028152
## 488 0.3387597976 -2.237158e-01 0.401280941 0.4105246674
## 489 -0.5052322693 7.884719e-01 0.361449733 0.7042002406
## 490 -1.1207842001 1.526398e-01 -0.040989034 0.0299623662
## 491 -0.6819220113 1.727942e-01 0.388665940 0.4004765372
## 492 0.0763147141 4.097768e-01 0.427983629 0.9072146132
## 493 -0.9579549275 -1.947385e-01 0.191272175 -0.1845394502
## 494 0.6588313477 -1.192212e-01 0.555011491 -3.8150946329
## 495 -0.7125164355 -6.041199e-01 0.370247297 -0.3841965984
## 496 -0.1383483892 1.798694e+00 -0.745529986 -0.5909029739
## 497 0.2751250275 3.960136e-01 0.510194471 1.3294848103
## 498 -0.9494509444 3.373425e-01 0.306326567 0.1939213031
## 499 0.7718779014 -2.676280e-01 -0.368932320 -0.3246206554
## 500 0.8313102032 5.330190e-01 0.600949327 0.4935326278

```

```

# using the psyche package
library(psych)

```



```
fit.pc<-principal(num[-1],nfactors=4,rotate = "varimax")
fit.pc
```

```
## Principal Components Analysis
## Call: principal(r = num[-1], nfactors = 4, rotate = "varimax")
## Standardized loadings (pattern matrix) based upon correlation matrix
##
```

	RC1	RC2	RC3	RC4	h2	u2	com
Distance.mi.	0.04	-0.15	0.78	-0.02	0.63	0.369	1.1
Temperature.F.	0.98	-0.04	-0.01	0.00	0.96	0.036	1.0
Wind_Chill.F.	0.98	-0.04	-0.02	-0.06	0.96	0.038	1.0
Humidity...	-0.52	0.55	0.14	-0.24	0.65	0.348	2.5
Pressure.in.	0.18	0.80	-0.14	0.03	0.69	0.305	1.2
Visibility.mi.	0.26	-0.69	-0.23	-0.01	0.60	0.404	1.5
Wind_Speed.mph.	-0.02	-0.01	0.02	0.99	0.97	0.028	1.0
Precipitation.in.	-0.10	0.27	0.67	0.04	0.53	0.469	1.4

```
##
##
```

	RC1	RC2	RC3	RC4
SS loadings	2.30	1.52	1.15	1.04
Proportion Var	0.29	0.19	0.14	0.13
Cumulative Var	0.29	0.48	0.62	0.75
Proportion Explained	0.38	0.25	0.19	0.17
Cumulative Proportion	0.38	0.64	0.83	1.00

```
##
## Mean item complexity = 1.3
## Test of the hypothesis that 4 components are sufficient.
```

```
##
## The root mean square of the residuals (RMSR) is 0.11
## with the empirical chi square 336.65 with prob < 7.9e-74
##
## Fit based upon off diagonal values = 0.83
```

```
# fit loadings
round(fit.pc$values,3)
```

```
## [1] 2.552 1.361 1.087 1.003 0.895 0.609 0.489 0.005
```

```
fit.pc$loadings
```

```
##
## Loadings:
##          RC1    RC2    RC3    RC4
## Distance.mi.      -0.146  0.779
## Temperature.F.    0.981
## Wind_Chill.F.     0.978
## Humidity...      -0.518  0.554  0.136 -0.242
## Pressure.in.      0.176  0.802 -0.143
## Visibility.mi.     0.263 -0.687 -0.232
## Wind_Speed.mph.           0.986
## Precipitation.in.    0.268  0.670
##
##          RC1    RC2    RC3    RC4
## SS loadings  2.298 1.519 1.150 1.036
## Proportion Var 0.287 0.190 0.144 0.130
## Cumulative Var 0.287 0.477 0.621 0.750
```

```
# Loadings with more digits
for(i in c(1,2,3,4))
{
  print(fit.pc$loadings[[1,i]])
}
```

```
## [1] 0.0439084
## [1] -0.1463001
## [1] 0.7794412
## [1] -0.02155448
```

```
# Communalities
fit.pc$communality
```

```
##      Distance.mi.    Temperature.F.    Wind_Chill.F.    Humidity...
##      0.6313249      0.9636461      0.9616095      0.6524521
##      Pressure.in.    Visibility.mi.    Wind_Speed.mph.    Precipitation.in.
##      0.6945646      0.5957711      0.9724585      0.5314375
```

Rotated factor scores, Notice certain peculiarities in columns
fit.pc\$scores

##	RC1	RC2	RC3	RC4
## 1	0.7075876685	-1.482327e-02	-0.269935363	0.6967047149
## 2	1.7121365757	-1.844247e-01	-0.225751051	0.0215835716
## 3	1.3260273823	4.533234e-01	-0.341188753	-0.2921748550
## 4	0.1299404855	9.585624e-01	0.622450461	-0.5295759258
## 5	-0.3715418993	-5.940203e-02	-0.464664745	0.8050258262
## 6	-1.5548759963	1.046323e+00	0.206113596	0.3768002067
## 7	-2.6136722264	-5.319935e-01	-0.771936451	0.3704750273
## 8	0.7651284923	3.830730e-02	-0.309552667	0.7436426674
## 9	-1.0288510870	-4.095678e-01	1.260465076	-0.9800498821
## 10	-0.6121435856	-4.740007e-01	-0.057230746	0.2893933003
## 11	0.5901374921	-8.105506e-02	-0.452613596	0.1125149266
## 12	-0.1185809044	2.936070e-01	-0.536196280	0.3072905164
## 13	1.6357085730	-5.133351e-01	-0.219628338	0.9759128899
## 14	1.5864077186	-6.906448e-01	-0.263156971	0.4158477549
## 15	-1.4931977896	-1.519409e+00	0.102238847	-0.8694960225
## 16	-0.0793539063	1.360161e+00	2.316995660	1.0857757999
## 17	-0.2232991448	3.404437e-01	-0.228075768	-1.3884976581
## 18	-0.8054133349	8.525205e-01	-0.411403689	-0.4605132855
## 19	0.0123486341	-6.299878e-01	0.095049713	1.1936988121
## 20	-0.8109810108	-5.502332e-01	-0.409772900	-0.6977485257
## 21	0.1401946877	5.410841e-01	-0.381900486	0.6532527267
## 22	0.2134887760	-1.410342e-01	-0.427928146	0.0338115768
## 23	-0.5433008891	-1.076672e-01	-0.503708620	-1.1946405836
## 24	0.5794661413	1.489479e-01	-0.324871346	0.1801821803
## 25	0.2328863842	-3.629019e+00	0.053992822	-0.0486757890
## 26	0.9540025804	3.137228e-01	-0.372366276	-0.7704746776
## 27	0.1644934075	5.358822e-01	0.744640090	-0.5313055442
## 28	-0.0150989364	2.929212e-01	-0.240742330	-1.5270682268
## 29	0.1611332230	4.265582e-01	-0.433329547	-0.8643237389
## 30	1.4519051905	1.669543e-01	-0.330299648	-0.0068088181
## 31	0.1873743787	-2.886155e-01	-0.357476169	0.1541727095
## 32	0.3477274350	1.640666e+00	3.141602339	-0.0344348723
## 33	-1.3907534396	1.259691e+00	-0.304958857	-1.1971550536
## 34	0.0521086166	2.138952e-01	-0.218250629	-1.6233325544
## 35	0.5590280420	6.783081e-01	-0.370331150	-0.2995116471
## 36	1.1088801030	-2.152695e+00	0.230555493	0.1763725997
## 37	0.6164452225	6.568579e-01	-0.366476423	-0.2868705099
## 38	-0.1176380222	-2.523113e-01	-0.606494525	0.4454513006
## 39	0.0967555392	-1.917385e-01	1.840855277	-0.6425614056
## 40	0.5519889467	6.722729e-01	-0.364389305	-0.1366635430
## 41	1.2686053099	4.356902e-01	-0.394424122	0.8031515653
## 42	-2.2840583018	-3.463381e-01	-0.587468807	0.2610668332
## 43	-1.4474928895	7.744825e-01	-0.165304337	0.2122850361
## 44	-0.1974917607	-2.295045e+00	0.785879412	-0.0646690726
## 45	-0.0467919890	5.115978e-03	-0.444776123	-1.2353553163
## 46	-1.2267531039	7.519453e-01	-0.007375148	-1.1774163881
## 47	-0.6951661546	-5.697848e-01	-0.345986014	-1.2714074214
## 48	1.5305512490	-1.215729e-01	-0.284908184	-0.5315646901
## 49	1.1478324436	1.007179e-01	-0.341407966	0.3217747110

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## 50 -0.0918887052 5.244682e-01 -0.410260370 -1.4900009985
## 51 1.2644957818 4.044877e-01 -0.320938401 1.2195236508
## 52 -1.3830730908 2.756770e-02 -0.491380575 -0.7940279753
## 53 0.5024897247 4.568425e-01 -0.399312963 -0.3539986161
## 54 -1.9208384987 5.103132e-01 0.744350669 -0.4428388623
## 55 0.7606657955 -9.136718e-02 -0.337215194 2.5353153151
## 56 1.0325139382 -5.036437e+00 -0.230332026 -1.0438508452
## 57 0.9592805455 -2.780924e-02 -0.439633668 0.3085858236
## 58 -1.4703662059 -3.555993e-01 -0.456379692 1.0670886843
## 59 -1.5262506779 -1.331988e+00 -0.127798714 -0.5870920390
## 60 0.7284949603 -4.897568e-01 -0.340471076 -0.5509776652
## 61 -2.1772343195 -2.949640e+00 0.133262203 0.2257330028
## 62 -1.6872141947 -2.101162e-02 -0.490903610 -0.7238789094
## 63 -0.9315536251 -2.723487e-01 -0.149508193 1.0188039911
## 64 0.3886821508 3.527413e-01 -0.405828774 1.0377049247
## 65 -1.4339046255 9.528973e-01 -0.233980320 0.0754750611
## 66 -0.3898177385 2.131810e-01 -0.512879240 -1.2763203136
## 67 -1.9177353537 1.369763e+00 -0.413045141 0.5574461076
## 68 0.1509421647 -2.359953e+00 0.481737002 0.3941369451
## 69 -0.4164765132 -4.655485e-02 -0.351937270 0.1189930925
## 70 1.0287472922 -6.787296e-01 -0.215170091 0.2446384983
## 71 -0.6646543763 1.324537e-01 1.622348336 2.3570508556
## 72 0.4432845450 6.811446e-01 -0.344401551 -1.0395440008
## 73 0.6133172400 5.303390e-01 0.512298009 -0.3258445672
## 74 0.1854545500 7.037211e-01 -0.385433721 0.6692514245
## 75 -2.1313568180 2.712349e-01 -0.691042684 3.2975798923
## 76 -1.4311654330 1.173949e+00 0.167910544 -0.6920502441
## 77 0.7678741226 5.178532e-01 -0.365322955 -0.5499649105
## 78 -0.3385949970 4.345741e-01 -0.482189029 -1.3955384201
## 79 1.0718603619 -2.524645e+00 0.405847555 0.2290518835
## 80 1.1056319022 -1.920915e+00 7.054508417 -0.5546678815
## 81 0.8600308809 1.669423e-01 -0.385028165 0.3090564413
## 82 0.0556401637 1.276309e-01 -0.379161932 0.8560987281
## 83 -0.7932308765 1.434992e+00 1.549677993 -1.2315935857
## 84 0.5198248461 6.897184e-01 -0.355710675 -1.0131208363
## 85 0.2368765073 4.054455e-02 -0.307223723 0.6469748150
## 86 1.1437767265 2.196395e-01 -0.296880693 0.0415029310
## 87 -2.1944036572 1.304814e-01 -0.197756170 -1.1615793978
## 88 -1.0703396218 6.239200e-01 6.861223777 0.5942388547
## 89 -0.8644033625 1.574840e+00 -0.152630035 -1.3382317604
## 90 -0.9901996474 1.259250e-01 -0.542945533 1.4482460943
## 91 0.6721322718 1.311529e-01 -0.029041237 0.0466744352
## 92 0.5551743787 6.127031e-01 0.230966559 0.0328977277
## 93 0.5157261657 3.337641e-01 -0.416761504 -0.1095204441
## 94 0.3886441949 1.552306e+00 1.363653626 -1.4982789224
## 95 -0.1943528345 2.536209e-01 -0.401813672 -0.9062925668
## 96 -1.2752089153 -4.919907e-01 -0.268072989 0.3322541965
## 97 1.1095325704 -7.526722e-02 -0.391084120 -0.2280184638
## 98 -1.5717852396 9.166371e-01 1.282822004 -0.5605405893
## 99 -2.1131266737 -3.062952e+00 0.228028757 -0.8902956585
## 100 0.5965019051 4.334759e-01 -0.411375755 0.1997166571
## 101 1.3514250187 3.373154e-01 -0.308301923 -0.8020772075
## 102 1.1704724355 6.712381e-02 -0.379552294 0.3933910593
## 103 -1.0015126051 -1.094105e+00 -0.183658241 0.8650757606

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## 104 0.9109858832 5.199459e-01 -0.340580927 0.6310785271
## 105 0.9517241574 -3.675015e-02 -0.466643359 0.1791912827
## 106 1.3088057257 -3.370972e-01 -0.128639456 1.5725604183
## 107 0.1220111234 -3.922512e-03 0.501470318 -1.2408791995
## 108 0.1482865669 -4.496253e-01 -0.441675622 -0.5220899504
## 109 -0.0775310063 2.685522e-01 -0.589160701 -0.1108074701
## 110 -0.4138807680 -2.168628e+00 0.326945842 0.0896914891
## 111 1.1506912731 -2.307122e+00 0.307611831 0.3555540411
## 112 -0.0193298943 -1.041657e-01 -0.438426093 -0.6871925167
## 113 0.5142931047 -9.922637e-02 -0.219445420 -0.0591520726
## 114 0.4210225294 -5.895726e-01 0.429776809 0.7158871631
## 115 1.3587352205 4.196576e-01 -0.322033538 -0.3012476605
## 116 -0.0199830237 3.461208e-01 -0.445744738 -0.5069478683
## 117 -0.8542792536 9.059632e-01 -0.480472782 -0.6460292053
## 118 -0.1204280745 -1.357773e+00 -0.024619610 -0.8248512487
## 119 -0.3052324683 2.673725e-01 -0.592762071 -0.3153764263
## 120 0.5103167587 4.479025e-01 -0.370731509 -0.3903772353
## 121 -1.0704829385 9.770436e-02 0.247514601 1.6024842596
## 122 -0.4376565386 4.950918e-01 -0.525588250 -0.3513135601
## 123 0.0509626174 9.131519e-02 -0.403302817 0.7334660805
## 124 0.1719006719 6.769905e-02 -0.471740767 -0.1599500701
## 125 -0.6855055090 -2.180888e-02 -0.675686170 0.5373595129
## 126 -1.0425385426 -1.705916e-01 -0.395948367 4.2227788032
## 127 -0.1360443232 -2.049354e+00 0.158225076 -0.8283557025
## 128 0.2259162459 9.580240e-01 0.268603752 -1.2852276816
## 129 0.9865542249 -3.118229e-01 0.330515331 0.9808345744
## 130 0.4782776393 1.143918e+00 0.096571827 -0.3018402677
## 131 1.1021263730 -2.939148e-03 -0.258120457 1.7663078494
## 132 -0.3185120151 5.068694e-01 -0.466316865 -0.4202442258
## 133 0.3364971386 6.950164e-01 -0.386632860 -1.5137401425
## 134 1.5412216390 3.733987e-01 -0.306037736 1.5989968372
## 135 -0.7735091321 1.280708e+00 -0.109696745 0.7306676578
## 136 0.2020280288 -1.018740e+00 0.616572053 -0.6684378955
## 137 -1.4894440569 2.066804e-01 4.097752289 0.5588098954
## 138 -0.8494641015 6.423541e-01 -0.512797819 1.3202170468
## 139 0.5703045610 7.008351e-01 -0.325526269 -1.5629804045
## 140 0.5784460158 -3.992817e-01 -0.239282652 -0.2461980115
## 141 -0.1192667304 -2.214717e+00 0.187588819 0.8984916225
## 142 0.6418966699 6.909740e-01 -0.362548040 -1.4934167277
## 143 -0.3168415583 9.499978e-01 2.665228410 -0.1574849234
## 144 1.2150063750 7.741511e-01 -0.219015390 -0.1219443018
## 145 0.9997348802 -2.614143e-01 -0.457421633 0.0892272113
## 146 1.8088323160 -1.253703e-01 -0.319973579 -0.0186151536
## 147 -0.2517568868 1.200372e+00 -0.090650487 -0.6433197343
## 148 1.8630270908 -1.739379e-01 -0.212412319 0.3655025233
## 149 1.3483525418 -1.309236e-01 0.888647114 -1.3035314722
## 150 -0.0384591261 1.601319e+00 0.766419636 1.0511050894
## 151 0.3646337366 4.305214e-02 -0.318500212 0.0032458082
## 152 0.4963094277 -5.282148e-01 -0.426198947 -0.1129417732
## 153 0.2166543214 2.135238e-01 -0.303430252 -0.9607499294
## 154 1.3632305996 2.263721e-01 -0.383805120 0.3728266092
## 155 0.3401005254 -2.197527e+00 0.219276202 0.9267658204
## 156 -0.0875799391 -2.984988e+00 0.311055792 -1.1958629971
## 157 1.0237810935 -3.968507e-01 -0.289379455 0.2436290547

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## 158 -0.4460826824 5.337717e-02 -0.415998198 -0.0022404245
## 159 -0.7741298116 1.237086e+00 -0.259708587 -1.3570561920
## 160 -0.3562683297 2.804772e-01 -0.379196869 -0.6366945136
## 161 -1.9763371400 -3.293266e-01 -0.516780619 1.0763871079
## 162 0.0339646434 1.825787e-01 -0.360201720 -1.4102968077
## 163 -0.1850160666 -5.891615e-02 -0.607241854 -0.4903662391
## 164 -0.8600488592 -3.474705e-02 -0.582548388 3.9607443617
## 165 -1.1167728384 1.455003e+00 0.157958171 0.1086136076
## 166 -0.9238716366 8.032407e-01 -0.069316499 -0.3002989750
## 167 -0.4530019330 -1.265435e+00 -0.166723203 0.3085025595
## 168 -0.2898218591 4.024365e-01 -0.452049377 1.4776413597
## 169 -0.3708178006 2.628122e-01 -0.493932592 -0.4673842904
## 170 -1.2593999085 9.388093e-01 -0.056111303 0.1873262382
## 171 0.3498618992 2.593399e-02 -0.394822948 1.1390750583
## 172 1.6561064437 2.727049e-01 -0.333253985 -0.1772825971
## 173 1.8453568439 -1.801182e-01 -0.203053677 0.1809404763
## 174 0.0640707387 5.142409e-01 -0.430009811 -1.4303927763
## 175 0.7924802120 1.022093e+00 -0.251035283 2.0352668461
## 176 0.8212756061 3.509896e-01 -0.332304102 -0.0137999722
## 177 0.0924208773 5.974202e-01 -0.412162034 0.7317760998
## 178 -0.0554299184 6.405910e-01 0.019071355 2.6488190026
## 179 -1.1414923806 1.287589e+00 0.461569118 -0.5299229126
## 180 -0.1528986047 1.062651e+00 -0.088026933 -0.2368469749
## 181 -1.4985190378 -1.681714e+00 0.007808448 -0.6447310359
## 182 0.1809625017 4.794429e-01 -0.423307345 3.3632297837
## 183 -0.6826342432 -1.897642e+00 0.137180904 -0.5851975638
## 184 -1.4377716962 -9.722153e-01 0.550077737 0.5241555695
## 185 -0.3079837694 -1.722297e-02 1.727783677 -0.4306192891
## 186 0.8985213230 2.282352e-01 -0.408666413 1.3486200796
## 187 -1.3268865556 -5.615007e-01 -0.550528837 -0.0298774463
## 188 0.6325662820 1.083827e-01 -0.456011042 2.7784384055
## 189 0.5440204713 -1.441193e-01 -0.223546844 0.6503620384
## 190 0.7766850169 5.125170e-01 -0.335513498 -0.2486203276
## 191 -1.9189256738 1.017034e+00 -0.427255394 0.4008952873
## 192 1.5002802113 -2.239886e-01 -0.254865450 1.0634786518
## 193 0.5484907216 5.639521e-01 -0.411235949 -0.5397700827
## 194 0.1874828551 1.068728e+00 -0.202641365 1.1368724399
## 195 0.2038683902 -6.251351e-02 -0.437762570 -0.3241973049
## 196 0.7037269882 4.198865e-01 -0.420440607 2.4511498785
## 197 1.2302887758 3.569977e-01 -0.340221303 -0.7848039809
## 198 1.0240279196 -3.418772e-01 -0.366961986 -0.5172281261
## 199 0.6217725967 -5.646975e-01 -0.238033531 4.0809312140
## 200 -0.7641270651 -2.638556e-02 -0.687025725 -0.1441326889
## 201 -1.8910475722 1.181246e+00 -0.079462817 1.8439567254
## 202 -0.9058191220 1.041251e+00 -0.404445757 0.2651906649
## 203 0.6195822647 -5.878068e-03 -0.196064863 0.0605452544
## 204 -1.9919493859 -4.426942e-01 -0.447900336 0.3152601075
## 205 -0.9525068862 9.235043e-01 1.050254018 0.9091217449
## 206 0.1429092390 -1.613405e-01 -0.261143438 -0.2109124349
## 207 1.4708677671 -8.545133e-02 0.553044243 -0.1381800504
## 208 0.8886049105 8.074060e-02 -0.362179990 -0.7081791106
## 209 -0.5156163965 2.894313e-01 -0.497686190 -0.5211945750
## 210 1.0837268904 1.950632e-01 -0.262862920 -0.3493351056
## 211 0.5960221607 7.348978e-01 -0.155891166 -0.9799142161

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## 212 0.8052624222 -2.187703e-01 1.924340958 -0.0934993647
## 213 0.2207847849 -2.597947e+00 0.434191628 -0.4439364367
## 214 1.2467532566 4.543090e-01 -0.321756495 0.8580047020
## 215 0.5051086168 5.762362e-01 -0.242588997 -0.9844168852
## 216 0.7229229903 3.669861e-02 -0.363291272 -1.2298982160
## 217 0.6251906791 4.647917e-02 -0.369023670 -0.3907501909
## 218 -1.5827709666 6.092918e-01 -0.141964051 0.3895061460
## 219 -0.1008595214 -3.455252e-01 0.011805153 2.0416721106
## 220 1.0063639340 7.100189e-01 -0.277036524 1.1008515361
## 221 1.0864515638 -1.335125e+00 -0.024199982 -1.1338230161
## 222 1.2357195497 -8.259251e-01 2.063101941 -0.3371613501
## 223 1.3466970287 3.587931e-01 -0.297517104 0.8768518538
## 224 0.0574027088 -1.117983e+00 4.289593209 -0.3655258148
## 225 -0.4095606371 -6.463937e-01 -0.429381077 3.0144337697
## 226 -0.3027988923 1.036965e+00 -0.053685320 -0.8785040646
## 227 -0.5516405030 -9.673648e-02 -0.406898664 -1.3395991814
## 228 -0.2620689476 -6.549919e-02 -0.470541320 -0.6981266205
## 229 -0.8447866852 4.630819e-01 -0.102789727 0.1258466048
## 230 -0.4398531304 1.261032e+00 0.477937375 0.1453020459
## 231 1.1835520536 -5.272445e-01 -0.360345623 -0.4284905271
## 232 -0.4497435329 3.200964e-01 -0.308817900 -0.7854435263
## 233 0.4713261799 8.077947e-01 -0.145558467 -1.4433801679
## 234 -0.5162277309 -1.403774e-01 -0.415439212 -0.7935181857
## 235 1.0085433650 3.391891e-01 -0.346690035 -1.3185792124
## 236 0.3284110122 6.568963e-02 -0.280623097 -1.4289502974
## 237 0.0242568430 1.056631e-01 -0.518993270 0.5491892705
## 238 -0.9316390178 -4.537727e+00 -0.342028375 -0.3940601290
## 239 0.0869466725 2.348909e-01 -0.516812582 -0.3437271300
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## 241 1.0554303138 9.975540e-01 0.371891341 -0.0465978027
## 242 0.4991033374 -6.600295e-02 -0.441984485 -0.6058034843
## 243 -0.4093478490 -9.219804e-02 -0.649449807 1.5967009520
## 244 1.1444388325 -4.740783e-01 0.378759856 -0.1245074086
## 245 0.9003191061 1.035499e-01 -0.368671270 -0.1944107883
## 246 -1.5985971074 -5.387109e+00 -0.459059174 0.8434444253
## 247 0.1210691704 3.805705e-01 -0.345085270 -1.4919371403
## 248 0.3333636721 5.146048e-01 -0.376628564 0.0728556703
## 249 -0.4468535252 6.534521e-01 -0.235272409 -0.5062643149
## 250 1.2225881127 5.200612e-01 -0.287983695 0.7802114716
## 251 0.2201927244 5.639996e-01 0.958396212 -0.4544808679
## 252 0.9661646972 5.091691e-01 -0.340753969 0.1340464203
## 253 1.1384435317 -4.969977e-01 -0.278182717 -0.5661313528
## 254 -3.0293641206 -4.735090e-01 -0.735922647 -0.2917662725
## 255 -2.6950111050 -1.526664e+00 2.043060260 -0.0217564483
## 256 1.3349400105 -8.052968e-02 0.670483010 1.2927767149
## 257 -1.2643775355 1.331063e+00 -0.352426115 -0.7456298410
## 258 0.1624295554 3.911284e-02 -0.302878771 -0.0531397201
## 259 1.0919253603 3.241319e-01 0.951842244 -0.6496681801
## 260 -1.6752496721 1.232492e+00 -0.293216915 0.0837303279
## 261 0.2178243016 9.153114e-01 -0.156442376 -0.1641436748
## 262 0.0956857076 -6.255736e-02 0.461451035 0.0236282983
## 263 0.7724177810 3.072336e-01 -0.387109788 0.9248552260
## 264 -0.7676691350 3.922493e-01 -0.554003857 -0.8401829809
## 265 0.4901418943 -2.103095e-01 -0.413842687 -0.5931229497

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## 266 0.3247150467 7.840522e-01 -0.377917828 -1.4564921167
## 267 0.4351333974 7.385026e-02 0.093313521 -0.2567182504
## 268 1.0476627586 -4.532383e-02 -0.224239320 1.3834017283
## 269 0.8479897824 -7.651775e-03 -0.375840518 1.2116889233
## 270 -0.3518661421 3.297774e-01 -0.514970693 -0.4591941341
## 271 -0.7679864528 -8.382158e+00 -1.410321115 -0.7084438351
## 272 -0.1539248376 3.149948e-02 -0.465191199 -0.3246920088
## 273 -0.4747125079 1.665545e+00 3.161018494 0.1011338862
## 274 0.8345754263 -2.034662e-01 -0.276599965 0.8001069903
## 275 0.5605251880 3.485252e-01 -0.223795028 -0.3850414689
## 276 -0.4022722146 1.394917e+00 0.223749437 -0.1004405954
## 277 -1.7741907551 9.355518e-02 -0.620551725 1.6458956932
## 278 0.1265302909 5.777003e-01 -0.353636367 -1.4398125280
## 279 -2.6275921664 7.242851e-01 -0.146568190 1.8055414774
## 280 1.0300629838 1.327329e-03 -0.347718099 1.5403581874
## 281 -1.2311029366 -2.932787e-01 -0.202761131 1.2268683190
## 282 -1.3693287384 -2.432107e-01 -0.676918456 0.5063910373
## 283 0.9090909016 5.509246e-01 -0.342221730 0.9620398360
## 284 0.6598419574 -1.312444e-03 -0.417205209 -1.1489114242
## 285 -0.3174783509 3.243049e-01 -0.381690727 -1.4946605581
## 286 -0.3824584239 1.454321e-01 0.061068591 0.0798988518
## 287 1.3414852105 -2.686181e-01 -0.455943786 -0.3613748218
## 288 -2.0885264397 -8.725671e-01 0.596514671 -1.3698174377
## 289 0.2317009543 -4.224090e-02 -0.552467102 -0.5025948709
## 290 0.7739685152 -2.102930e+00 0.197688922 2.1902911805
## 291 1.2672936254 9.192571e-02 -0.374232695 0.2229275451
## 292 1.2055203819 9.642929e-01 -0.213469017 -0.3331444586
## 293 -0.1341984986 -1.949524e-01 -0.505727285 1.2977984779
## 294 0.2261233795 -7.943099e-01 -0.431496275 -0.9033557528
## 295 0.0845811222 -5.224052e-01 -0.054235915 0.1684144223
## 296 0.5965414646 7.495297e-02 -0.417377370 0.1740614269
## 297 -1.9369350956 1.628458e-01 -0.764363158 0.8095439534
## 298 -0.0823465901 2.403030e-01 -0.332297954 -0.6410100974
## 299 -0.6671272592 4.729952e-01 0.227981567 0.5281664073
## 300 -0.3126698599 -1.316549e-01 -0.432563374 -0.7365476462
## 301 -0.7000075247 -2.162639e-01 -0.671998950 0.2596689579
## 302 -0.7676029792 5.504510e-01 -0.318360371 -1.3237850705
## 303 -0.3215853625 1.926403e+00 3.286913750 0.3204731700
## 304 -0.4526434046 5.371454e-01 -0.489427038 0.0890833803
## 305 1.2079296376 -8.041583e-02 -0.316717925 -0.1455430079
## 306 -0.3380919559 -7.116729e-02 -0.426280660 -0.4323071399
## 307 -0.1325310204 3.010127e-01 -0.509042448 -1.2701348288
## 308 0.4144745371 3.876211e-01 -0.424203745 1.2257770386
## 309 -2.2080088857 1.219441e+00 -0.392111222 1.9558798836
## 310 0.0814372628 1.674071e-01 -0.239193957 1.1550762702
## 311 -1.7641054469 -2.051870e+00 0.025703334 -0.4032345148
## 312 1.0535485169 -8.059740e-02 -0.203231566 -0.5061960388
## 313 -0.7092207363 1.686930e-01 -0.490213313 -1.3479743970
## 314 0.3809583273 4.136968e-01 1.426037443 -0.5298684654
## 315 0.6902895181 -3.446944e-02 -0.129654820 0.8398936840
## 316 1.6382400229 -8.973077e-01 -0.106789916 -0.5734554387
## 317 -1.1459958189 2.294307e-01 -0.609391306 -1.2759273023
## 318 -2.1793546937 -4.046745e-01 -0.652291628 0.2230227391
## 319 1.5003313973 -1.275931e-01 -0.199551913 2.1396915510

```

```

## 320 1.6546012221 -1.559378e+00 0.103199092 -1.0653622011
## 321 -0.1654966575 1.484162e-01 0.969506908 -0.3293085487
## 322 -2.8072231119 1.728242e-01 1.014451826 1.6293772172
## 323 0.3064148321 7.601498e-01 0.023292042 0.2112092803
## 324 1.2940002597 3.030267e-01 0.629927745 0.9400146984
## 325 0.9420063940 -8.612299e-02 -0.329161137 -0.1720141723
## 326 0.0255875852 6.225210e-01 -0.378642287 -1.4465161323
## 327 -1.7520041484 1.289109e+00 -0.145815494 -0.3697995969
## 328 -0.2836732535 1.964691e-01 -0.494179289 0.2547709578
## 329 -0.9177255861 -5.868991e-01 -0.019804307 2.4556646452
## 330 -1.2861018261 -1.120402e+00 -0.115765292 -0.3005054893
## 331 1.3604870666 5.750861e-01 -0.171470521 -0.2187875498
## 332 1.3093580448 2.713225e-01 0.490995258 -0.3695460676
## 333 -0.6556751569 -2.043619e-01 -0.427479454 -1.2873464663
## 334 -0.7558946197 3.640339e-01 -0.137077882 -0.1123402917
## 335 1.5119808316 4.402979e-02 -0.251111275 -0.4043213507
## 336 0.1219283884 -1.699924e+00 0.350456220 0.8398065920
## 337 1.1739790226 -1.127897e+00 1.194300234 -1.2910297791
## 338 0.7076168176 -6.397096e-02 0.183964720 1.1699004141
## 339 -0.0006412962 5.492584e-01 0.079938108 -1.3621428365
## 340 0.3267638204 -6.089048e-01 0.271291103 0.1311433096
## 341 -1.6648222244 -1.201301e+00 2.552588641 -0.3917145170
## 342 1.3490550313 8.640813e-02 -0.224604784 0.7053262442
## 343 0.0863061273 -2.312452e-01 0.308585625 -0.8148783236
## 344 -0.1846216688 5.426321e-01 0.001798156 -1.4796230804
## 345 1.1262011590 -8.234422e-01 -0.275718884 0.4037641585
## 346 0.3061257814 1.021434e+00 -0.240292036 -0.5145855245
## 347 -0.1495828420 -3.833291e-01 -0.542595365 -0.4541190662
## 348 -0.3068007261 4.159491e-01 -0.488136934 -0.1819429359
## 349 -0.1467613300 -3.506783e-01 0.510978303 2.0424054816
## 350 -0.0679268208 3.815120e-01 -0.484808836 0.0384898514
## 351 0.9573591556 6.477766e-01 -0.330544318 -0.4458149091
## 352 1.7360567266 -8.239906e-02 1.927283562 0.6409801138
## 353 1.7646318298 -2.776225e-01 -0.143764357 0.1184654631
## 354 -0.1558599829 -2.910258e-01 -0.506374061 1.8424220781
## 355 0.8345236005 -4.282365e-01 -0.213589665 0.1133162657
## 356 -1.1970616683 -6.549312e-02 -0.612329455 1.1942269198
## 357 -0.2354276529 1.289675e-01 -0.300318175 -1.5233072376
## 358 -0.5864535632 3.094011e-01 -0.139967790 0.1772556900
## 359 -0.2220024490 3.008126e-05 -0.534095277 -0.6244969979
## 360 -0.1036126847 4.234922e-01 -0.502530371 0.2121657945
## 361 -0.9594699802 4.969081e-02 -0.362279097 0.7319823403
## 362 -0.4069036550 9.235396e-01 -0.377898974 -1.2149532141
## 363 0.5911364523 -4.914946e-01 -0.418217664 0.2189210524
## 364 -0.1556967435 5.051329e-02 -0.450235247 -0.4120711223
## 365 0.2814681279 -7.929760e-01 -0.382458632 -0.9438229041
## 366 0.3405162322 -3.690467e-02 -0.126418825 1.1156206193
## 367 0.6145820018 1.765007e-01 -0.438828270 0.8509360941
## 368 0.1132425971 4.836985e-01 -0.383028255 -0.6261077100
## 369 1.3485828297 -1.075623e-01 -0.332501133 -1.1099613633
## 370 0.3133571840 -3.284650e-01 -0.320231975 0.8191077802
## 371 0.4005617137 5.114901e-02 -0.536704154 -1.0421927438
## 372 0.3042619045 3.356774e-01 -0.285657013 -0.1535213581
## 373 0.6648127030 2.334346e+00 4.308870672 1.1531782453

```

```

## 374 -1.0666535812 6.728443e-01 -0.185682663 0.1973270407
## 375 -0.4758248211 4.543032e-01 0.550997119 -0.7800236463
## 376 -0.4577197079 1.364951e-02 -0.349949539 -1.4470194026
## 377 0.0668558809 1.969561e-01 0.118825367 -1.3816610219
## 378 -0.6139760121 1.498481e+00 -0.111264639 -1.3777844313
## 379 0.1205523383 4.718528e-01 -0.387398338 -0.9547289742
## 380 -1.4964884861 5.544770e-01 0.838260601 1.3246607698
## 381 -0.4804278847 3.100635e-01 0.893562728 -0.0428429876
## 382 0.4494575736 -9.478369e-02 -0.531313469 0.2063822289
## 383 -0.8294844045 4.152518e-01 0.882142269 0.0050491321
## 384 0.2412381437 -5.365219e-01 -0.148441028 0.0810567708
## 385 0.9416785158 -2.122663e-01 1.668980095 -0.3532822801
## 386 -0.9178016525 1.248509e+00 -0.349935652 -0.2639628142
## 387 0.9849575477 1.794907e-01 -0.359188711 0.4593114082
## 388 0.1466471313 -2.248426e-02 -0.474912592 -0.1255847252
## 389 0.1699172662 3.514940e-01 -0.149278381 -0.1656327043
## 390 -1.2173061438 -5.153463e-02 0.376573618 -0.6232360302
## 391 1.6764267129 -1.037768e-01 -0.213664573 0.8190484798
## 392 1.2142346054 9.071873e-02 -0.386141517 -1.1315044625
## 393 -0.1401778724 6.142003e-01 -0.485763287 -0.4017632418
## 394 0.1106614492 -2.303989e-02 -0.613379290 -0.1027028963
## 395 0.3281696813 -4.473070e-01 -0.377596224 0.0976519365
## 396 0.4453192719 8.950584e-01 -0.287360844 -1.5022133311
## 397 -0.9611821313 -4.663808e-01 -0.502609684 -1.1332551361
## 398 1.2150761760 1.916807e-01 -0.271614361 -0.4828058571
## 399 0.1531723012 1.885628e-01 -0.507838718 0.5242423691
## 400 -0.3692023639 -1.256613e-01 -0.430887611 -0.2401005505
## 401 -0.3147217875 9.099113e-03 0.170335020 -0.4337436837
## 402 -1.2642700583 -2.092692e+00 0.781211992 0.4887402061
## 403 0.4441980758 4.062258e-02 -0.424910893 0.0009224949
## 404 0.7694931058 3.714842e-01 -0.405273022 -0.4366363129
## 405 -0.3711313732 4.312985e-01 -0.495469995 -1.3808737438
## 406 -1.0197061806 -4.246052e-01 -0.513240889 1.7635622053
## 407 -2.6980876989 -1.477529e+00 0.258961036 -1.5159948391
## 408 -0.0147295182 -5.093158e-02 -0.473842585 0.3664507868
## 409 1.1868009995 -2.064276e+00 0.203264423 -0.1449411573
## 410 -0.1790159221 -4.633585e-01 -0.348805579 0.4845506693
## 411 0.9041720609 6.270935e-01 -0.357723281 0.1028746368
## 412 0.4376204769 -3.798474e-02 -0.391110916 2.5360916995
## 413 0.3791768074 -1.274253e-01 6.823412171 -0.8721954667
## 414 0.2677944670 -7.925023e-01 -0.297468701 -1.0896706970
## 415 0.9439340743 -1.263386e-01 0.936609020 -0.5769332910
## 416 1.6591613153 -5.826509e-01 1.308874498 0.6007972128
## 417 0.0239428097 1.799615e-01 -0.511169141 -1.1937509940
## 418 0.6190871646 6.138186e-02 -0.401838570 -0.6909247515
## 419 0.2191166154 5.190544e-01 -0.474862372 -0.1481162644
## 420 -0.7114110408 3.319101e-01 -0.255315997 -0.8694766622
## 421 0.2398854456 4.435845e-01 -0.435493210 0.8495454135
## 422 0.0069851374 6.689104e-02 -0.383830419 -0.4853945042
## 423 1.2883449794 -1.747334e-01 1.003723733 2.2995946282
## 424 1.8388272428 -3.360607e-01 -0.228869724 1.4685317508
## 425 -1.2112244727 -6.003445e-02 -0.618021090 -0.6540560856
## 426 -0.1407943999 -3.174921e+00 0.307717586 -1.1283023296
## 427 -1.5017508183 -9.324366e-02 -0.426844834 1.9430611190

```

```

## 428 -0.0489816153 9.264315e-02 -0.418180676 -0.1148318824
## 429 -2.1363342452 -2.841941e-01 -0.588097149 -1.2850345185
## 430 -1.9508989151 5.293451e-01 -0.387713830 0.2248257852
## 431 0.1053530322 1.325633e-03 -0.428637625 -0.7194863226
## 432 -1.0149486563 1.281644e+00 0.040184796 0.5570998604
## 433 0.3369264829 -6.627683e-01 -0.418429092 -0.9526834121
## 434 0.5045401106 -1.089130e-02 -0.511855236 0.1561821853
## 435 -0.4224999946 -2.131159e+00 0.048392726 -0.0079884357
## 436 -1.0433253989 -1.939063e+00 0.394111626 0.8458990514
## 437 -0.3735734598 2.705798e-01 -0.530911898 -1.2693001796
## 438 -0.1372243866 -7.110066e-01 4.343741048 -1.6533010802
## 439 1.1911618946 -4.365533e-01 -0.144369769 1.4420061200
## 440 0.4020770438 7.613466e-01 1.218686320 -0.5027107351
## 441 0.2936587440 2.032541e-01 -0.371153229 -0.3348624291
## 442 -1.7502691355 -1.197433e+00 -0.028863217 -1.0183126016
## 443 -2.1076200316 -2.457903e+00 0.249256884 -1.6605040937
## 444 0.8831416924 4.475486e-02 -0.287191547 -0.2923920363
## 445 0.3303773873 2.759184e-01 -0.430542780 0.2405085221
## 446 -1.3587869717 -2.095112e+00 0.185109972 -1.3863146829
## 447 1.0904406075 -1.195207e-01 -0.222695015 -1.3086678067
## 448 -0.8317496918 4.800698e-01 0.724366753 1.2759327211
## 449 0.5110910855 5.265504e-02 -0.431575216 0.0176587104
## 450 0.7973337501 6.045708e-01 -0.355667353 0.6007893928
## 451 -0.9344236535 1.392796e+00 0.639009376 1.0030055741
## 452 -2.1434626873 5.788521e-01 -0.241624010 0.2789667406
## 453 1.4731043229 -4.524433e-01 -0.235837321 0.9476764271
## 454 0.0164800872 1.287321e+00 -0.157636286 -0.8736243773
## 455 1.1322226479 -2.350286e-01 -0.246229542 0.4797821472
## 456 -1.9067538306 1.273524e+00 -0.068325913 1.6340346582
## 457 -0.5013795974 2.194522e+00 6.616074499 0.3650802308
## 458 0.6763070780 2.243738e-01 -0.517064238 0.1044750841
## 459 0.4588575782 -2.474039e-01 -0.449014207 0.1474755475
## 460 0.2049256113 8.654227e-01 -0.276226750 -1.3377943443
## 461 -0.3970067430 1.858779e-01 -0.567309977 -1.1888692665
## 462 1.4992534243 -7.698704e-02 -0.256059094 -0.3535071636
## 463 -0.4398158658 1.393868e+00 -0.250873710 0.2270454075
## 464 -1.8227884597 -1.517424e-01 0.359742173 1.7888798901
## 465 -0.4706682022 1.499292e-01 -0.553132047 -1.2085305378
## 466 -0.8538589720 2.171052e+00 3.798395053 -0.1596733452
## 467 -0.3206341491 -5.775678e-01 -0.513039801 -0.4528993817
## 468 -0.3237366663 2.788563e-01 -0.524258850 -0.7622646182
## 469 -1.1407862603 1.571719e+00 -0.317082689 -0.1253225881
## 470 1.1719335684 3.379683e-01 -0.330009606 0.2195613255
## 471 -1.0714316767 -5.039092e-02 -0.569542028 -0.7030278420
## 472 1.7639970078 -3.705675e+00 6.977618318 0.6045247743
## 473 0.9920518797 5.719067e-01 0.386568311 -0.1408674224
## 474 0.3688028525 -1.736433e-01 -0.495899265 1.7042987075
## 475 1.0575252942 5.517138e-01 -0.344717913 -1.3934867842
## 476 -1.0667081613 3.561821e-02 -0.377042262 -0.6668240348
## 477 -2.7913523918 3.613024e-01 -0.428163123 -0.2718663691
## 478 -0.1262131172 9.856333e-02 -0.470387658 0.1148942160
## 479 -1.2159699295 6.361939e-01 -0.467549996 -0.3206448751
## 480 -1.0209416501 1.266492e+00 1.910220271 0.1857800033
## 481 1.0843083814 -7.084683e-02 -0.384044849 -1.0959588304

```

```

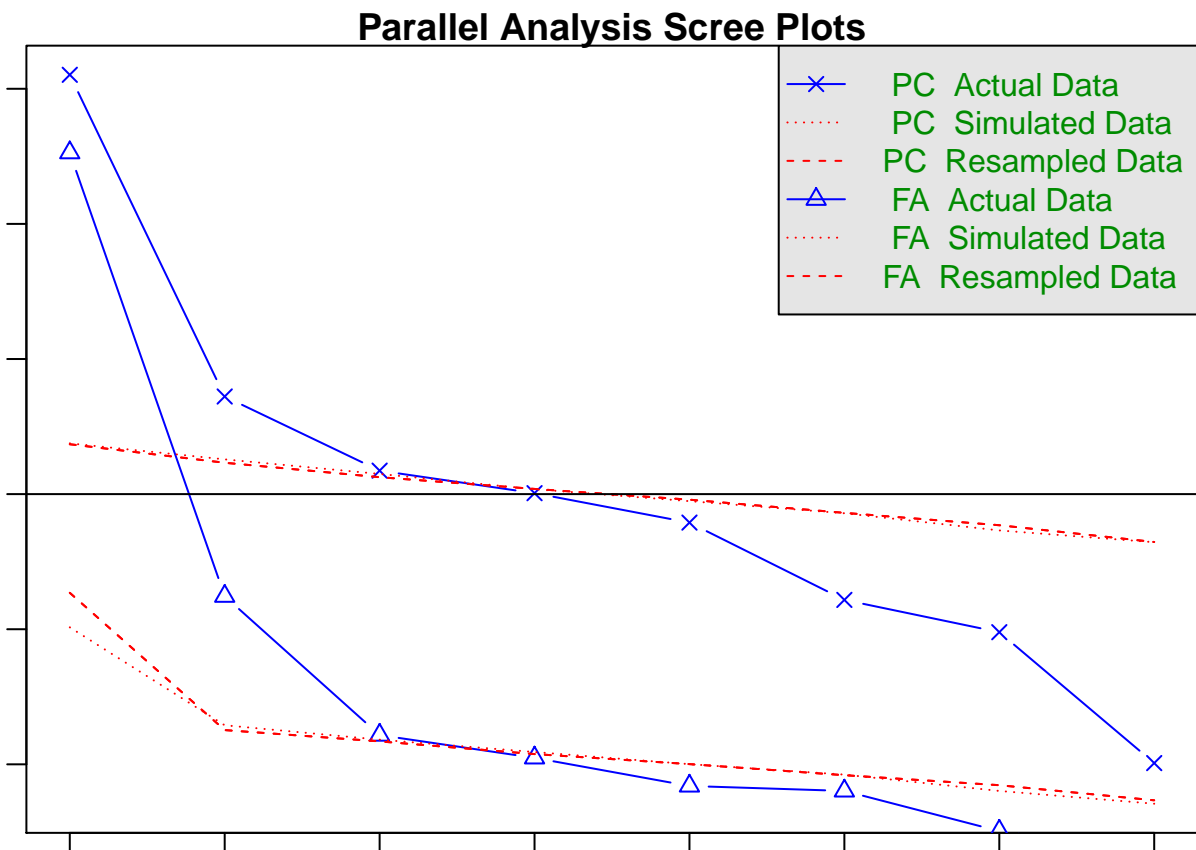
## 482  0.5125151049  7.015641e-01 -0.351340592 -0.6844995721
## 483  1.0237567071  6.586952e-01 -0.325057737  1.2571972720
## 484 -3.2004462754 -5.626270e-01 -0.746186859  1.7871899264
## 485  1.6853734437 -5.623053e-01 -0.209488007  0.6479057693
## 486  1.3365928908 -1.505591e-01 -0.364009250  1.2074389793
## 487 -0.0589980965  2.232973e-01 -0.529128987 -0.1768028152
## 488 -0.3387597976 -2.237158e-01 -0.401280941 -0.4105246674
## 489  0.5052322693  7.884719e-01 -0.361449733 -0.7042002406
## 490  1.1207842001  1.526398e-01  0.040989034 -0.0299623662
## 491  0.6819220113  1.727942e-01 -0.388665940 -0.4004765372
## 492 -0.0763147141  4.097768e-01 -0.427983629 -0.9072146132
## 493  0.9579549275 -1.947385e-01 -0.191272175  0.1845394502
## 494 -0.6588313477 -1.192212e-01 -0.555011491  3.8150946329
## 495  0.7125164355 -6.041199e-01 -0.370247297  0.3841965984
## 496  0.1383483892  1.798694e+00  0.745529986  0.5909029739
## 497 -0.2751250275  3.960136e-01 -0.510194471 -1.3294848103
## 498  0.9494509444  3.373425e-01 -0.306326567 -0.1939213031
## 499 -0.7718779014 -2.676280e-01  0.368932320  0.3246206554
## 500 -0.8313102032  5.330190e-01 -0.600949327 -0.4935326278

```

```

# Other FA Utilities
fa.parallel(num[-1]) # Factor recommendation

```



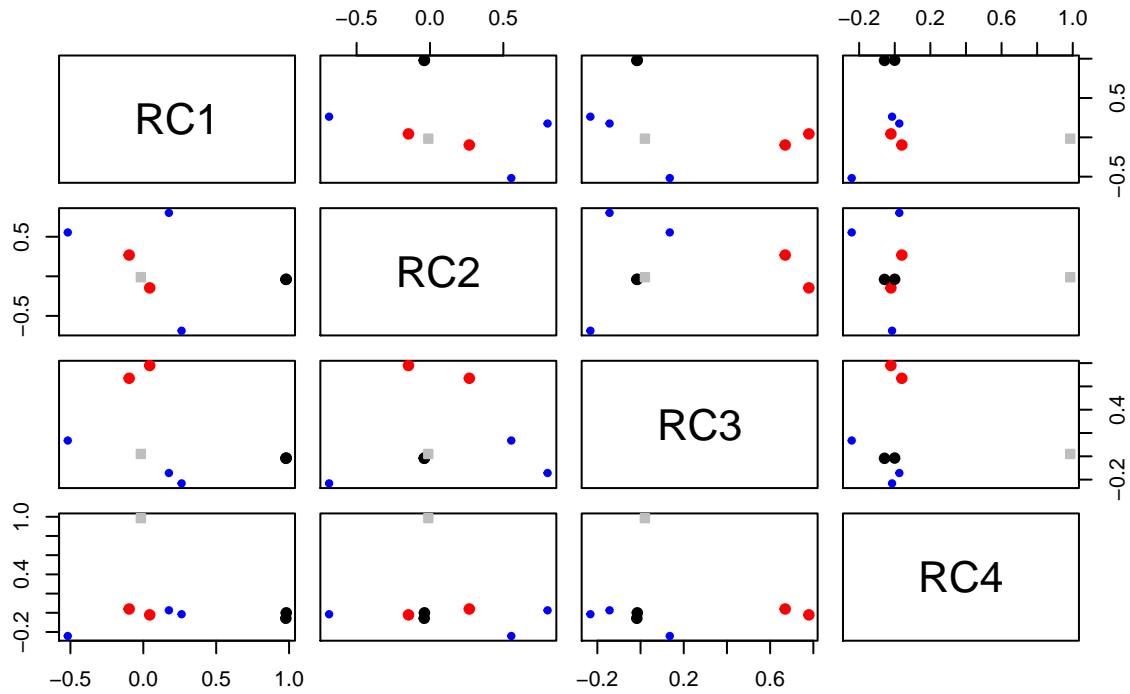
```

## Parallel analysis suggests that the number of factors = 2 and the number of components = 2

```

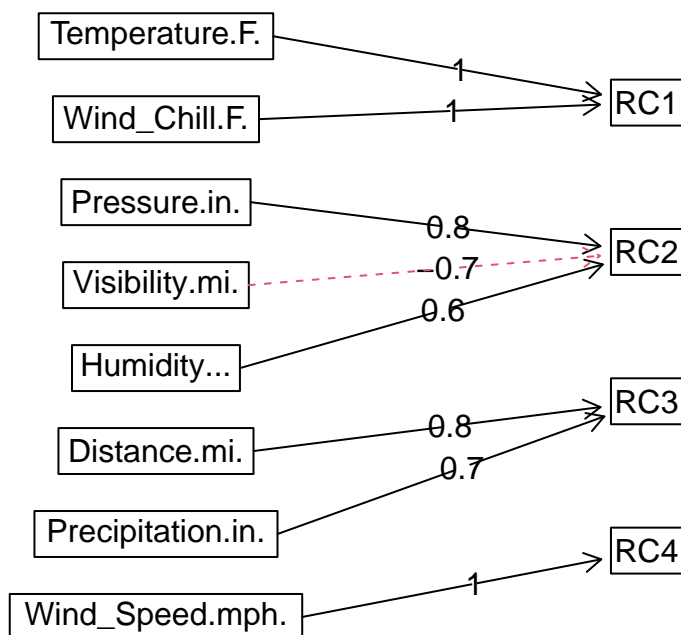
```
fa.plot(fit.pc) # Correlation within factors
```

Principal Component Analysis



```
fa.diagram(fit.pc) # Visualizing the relationship
```

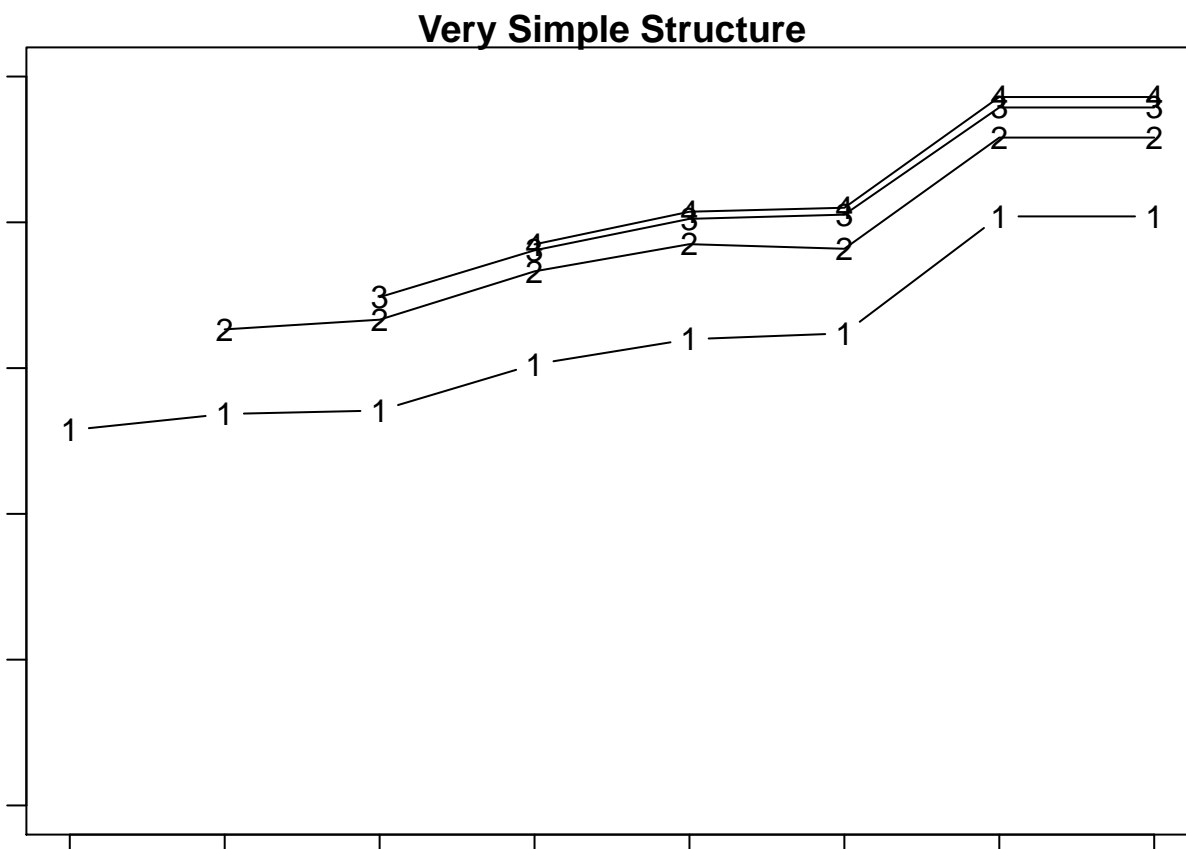

Components Analysis



```
vss(num[-1]) # Factor recommendation for a simple structure
```

```
## Warning in fa.stats(r = r, f = f, phi = phi, n.obs = n.obs, np.obs = np.obs, :  
## The estimated weights for the factor scores are probably incorrect. Try a  
## different factor score estimation method.
```

```
## Warning in fac(r = r, nfactors = nfactors, n.obs = n.obs, rotate = rotate, : An  
## ultra-Heywood case was detected. Examine the results carefully
```



```
##
## Very Simple Structure
## Call: vss(x = num[-1])
## VSS complexity 1 achieves a maximum of 0.81 with 7 factors
## VSS complexity 2 achieves a maximum of 0.92 with 7 factors
##
## The Velicer MAP achieves a minimum of NA with 1 factors
## BIC achieves a minimum of NA with 4 factors
## Sample Size adjusted BIC achieves a minimum of NA with 4 factors
##
## Statistics by number of factors
##   vss1 vss2 map dof  chisq    prob sqresid  fit RMSEA  BIC SABIC complex
## 1 0.51 0.00 0.12 20 1226.70 1.5e-247  5.80 0.51  0.35 1102 1166  1.0
## 2 0.54 0.65 0.13 13 217.15 4.0e-39   4.15 0.65  0.18 136 178  1.2
## 3 0.54 0.67 0.18 7 153.99 5.9e-30   3.62 0.70  0.20 110 133  1.4
## 4 0.61 0.73 0.28 2 49.90 1.5e-11   2.75 0.77  0.22 37 44  1.4
## 5 0.64 0.77 0.49 -2 8.79 NA 2.21 0.82 NA NA NA  1.4
## 6 0.65 0.76 0.95 -5 7.39 NA 2.09 0.83 NA NA NA  1.5
## 7 0.81 0.92 1.00 -7 0.57 NA 0.22 0.98 NA NA NA  1.1
## 8 0.81 0.92 NA -8 0.57 NA 0.22 0.98 NA NA NA  1.1
##   eChisq SRMR eCRMS eBIC
## 1 2.9e+02 1.0e-01 0.121 168
## 2 4.2e+01 3.9e-02 0.057 -39
## 3 1.8e+01 2.6e-02 0.051 -25
## 4 5.3e-01 4.4e-03 0.016 -12
## 5 1.1e-03 2.0e-04 NA NA
```

##	6	8.2e-04	1.7e-04	NA	NA
##	7	5.2e-05	4.3e-05	NA	NA
##	8	5.2e-05	4.3e-05	NA	NA