

# Factor.R

SHIVANSHI

2019-10-24

```
##Multivariate Project
##TELECOM-CHURN-ANALYSIS
##Author : Priyanshi Bajpai

##Importing Libraries

library(ggplot2)
library(dplyr)

## Warning: package 'dplyr' was built under R version 3.4.4

##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##   filter, lag

## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union

library (stringr)

## Warning: package 'stringr' was built under R version 3.4.4

library(data.table)

## Warning: package 'data.table' was built under R version 3.4.4

##
## Attaching package: 'data.table'

## The following objects are masked from 'package:dplyr':
##
##   between, first, last

library(grid)
library(gridExtra)

##
## Attaching package: 'gridExtra'
```

```

## The following object is masked from 'package:dplyr':
##
##      combine

library(corrplot)

## Warning: package 'corrplot' was built under R version 3.4.4

## corrplot 0.84 loaded

library(psych)

## Warning: package 'psych' was built under R version 3.4.4

##
## Attaching package: 'psych'

## The following objects are masked from 'package:ggplot2':
##
##      %+%, alpha

##Importing Dataset and doing preliminary analysis

#Importing CSV file from drive on my Local computer and viewing it

tablechurn<-read.csv("C:/Users/SHIVANSHI/Desktop/Priyanshi/MVA/Telecom Churn
Analysis Data.csv")
tablechurn <- as.data.frame(tablechurn)
View(tablechurn)

#Checking the Dimension of the dataset

dim(tablechurn)

## [1] 7043    21

#Viewing the first 4 rows of the dataset to get the overview of the dataset

head(tablechurn,4)

##   CustomerID Gender SeniorCitizen Partner Dependents Tenure PhoneService
## 1 7590-VHVEG Female              0      Yes          No        1          No
## 2 5575-GNVDE  Male              0      No           No       34          Yes
## 3 3668-QPYBK  Male              0      No           No        2          Yes
## 4 7795-CFOCW  Male              0      No           No       45          No
##      MultipleLines InternetService OnlineSecurity OnlineBackup
## 1 No phone service          DSL              No          Yes
## 2                   No          DSL              Yes         No
## 3                   No          DSL              Yes         Yes
## 4 No phone service          DSL              Yes         No
##   DeviceProtection TechSupport StreamingTV StreamingMovies      Contract
## 1                   No          No          No          No Month-to-month

```

```

## 2          Yes          No          No          No          One year
## 3          No          No          No          No Month-to-month
## 4          Yes          Yes          No          No          One year
## PaperlessBilling          PaymentMethod MonthlyCharges TotalCharges
## 1          Yes          Electronic check          29.85          29.85
## 2          No          Mailed check          56.95          1889.50
## 3          Yes          Mailed check          53.85          108.15
## 4          No Bank transfer (automatic)          42.30          1840.75
## Churn
## 1 No
## 2 No
## 3 Yes
## 4 No

```

*#Gaining more insight about the kind of data stored in each column*

`summary(tablechurn)`

```

## CustomerID Gender SeniorCitizen Partner Dependents
## 0002-ORFBO: 1 Female:3488 Min. :0.0000 No :3641 No :4933
## 0003-MKNFE: 1 Male :3555 1st Qu.:0.0000 Yes:3402 Yes:2110
## 0004-TLHLJ: 1 Median :0.0000
## 0011-IGKFF: 1 Mean :0.1621
## 0013-EXCHZ: 1 3rd Qu.:0.0000
## 0013-MHZWF: 1 Max. :1.0000
## (Other) :7037
## Tenure PhoneService MultipleLines InternetService
## Min. : 0.00 No : 682 No :3390 DSL :2421
## 1st Qu.: 9.00 Yes:6361 No phone service: 682 Fiber optic:3096
## Median :29.00 Yes :2971 No :1526
## Mean :32.37
## 3rd Qu.:55.00
## Max. :72.00
##
## OnlineSecurity OnlineBackup
## No :3498 No :3088
## No internet service:1526 No internet service:1526
## Yes :2019 Yes :2429
##
##
## DeviceProtection TechSupport
## No :3095 No :3473
## No internet service:1526 No internet service:1526
## Yes :2422 Yes :2044
##
##
##
##

```

```
##           StreamingTV           StreamingMovies
## No           :2810   No           :2785
## No internet service:1526   No internet service:1526
## Yes          :2707   Yes          :2732
##
##
##
##           Contract   PaperlessBilling           PaymentMethod
## Month-to-month:3875   No :2872           Bank transfer (automatic):1544
## One year           :1473   Yes:4171       Credit card (automatic) :1522
## Two year           :1695           Electronic check           :2365
##                               Mailed check           :1612
##
##
##
## MonthlyCharges   TotalCharges   Churn
## Min.   : 18.25   Min.   : 18.8   No :5174
## 1st Qu.: 35.50   1st Qu.: 401.4   Yes:1869
## Median : 70.35   Median :1397.5
## Mean   : 64.76   Mean   :2283.3
## 3rd Qu.: 89.85   3rd Qu.:3794.7
## Max.   :118.75   Max.   :8684.8
##                NA's   :11
```

`glimpse(tablechurn)`

```
## Observations: 7,043
## Variables: 21
## $ CustomerID      <fct> 7590-VHVEG, 5575-GNVDE, 3668-QPYBK, 7795-CFOC...
## $ Gender          <fct> Female, Male, Male, Male, Female, Female, Mal...
## $ SeniorCitizen    <int> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, ...
## $ Partner          <fct> Yes, No, No, No, No, No, No, No, No, Yes, No, Yes...
## $ Dependents       <fct> No, No, No, No, No, No, Yes, No, No, Yes, Yes...
## $ Tenure           <int> 1, 34, 2, 45, 2, 8, 22, 10, 28, 62, 13, 16, 5...
## $ PhoneService     <fct> No, Yes, Yes, No, Yes, Yes, Yes, No, Yes, Yes...
## $ MultipleLines     <fct> No phone service, No, No, No phone service, N...
## $ InternetService   <fct> DSL, DSL, DSL, DSL, Fiber optic, Fiber optic,...
## $ OnlineSecurity    <fct> No, Yes, Yes, Yes, No, No, No, Yes, No, Yes, ...
## $ OnlineBackup      <fct> Yes, No, Yes, No, No, No, Yes, No, No, Yes, N...
## $ DeviceProtection <fct> No, Yes, No, Yes, No, Yes, No, No, Yes, No, N...
## $ TechSupport       <fct> No, No, No, Yes, No, No, No, No, Yes, No, No,...
## $ StreamingTV       <fct> No, No, No, No, No, Yes, Yes, No, Yes, No, No...
## $ StreamingMovies   <fct> No, No, No, No, No, Yes, No, No, Yes, No, No,...
## $ Contract          <fct> Month-to-month, One year, Month-to-month, One...
## $ PaperlessBilling  <fct> Yes, No, Yes, No, Yes, Yes, Yes, No, Yes, No,...
## $ PaymentMethod     <fct> Electronic check, Mailed check, Mailed check,...
## $ MonthlyCharges    <dbl> 29.85, 56.95, 53.85, 42.30, 70.70, 99.65, 89....
## $ TotalCharges      <dbl> 29.85, 1889.50, 108.15, 1840.75, 151.65, 820....
## $ Churn             <fct> No, No, Yes, No, Yes, Yes, No, No, Yes, No, N...
```

*#The above results give us an insight that TotalCharges and MonthlyCharges are numerical values*

*#SeniorCitizen and Tenure are stored as numerical which need to be converted to categorical variables*

*## Performing Data Cleaning and Formatting*

*#Converting SeniorCitizen numerical variable into Categorical Variable*

```
tablechurn$SeniorCitizen<-factor(tablechurn$SeniorCitizen,levels = c(0,1),labels = c('no','yes'))
```

*#Converting tenure values into ranges of 12 months*

```
tablechurn <- mutate(tablechurn,Tenure_Range = Tenure)
cut(tablechurn$Tenure_Range,6,labels = c('0-1 Years','1-2 Years','2-3 Years','4-5 Years','5-6 Years','6-7 Years'))
```

```
##      [1] 0-1 Years 2-3 Years 0-1 Years 4-5 Years 0-1 Years 0-1 Years
##      [7] 1-2 Years 0-1 Years 2-3 Years 6-7 Years 1-2 Years 1-2 Years
##     [13] 5-6 Years 5-6 Years 2-3 Years 6-7 Years 5-6 Years 6-7 Years
##     [19] 0-1 Years 1-2 Years 0-1 Years 0-1 Years 0-1 Years 5-6 Years
##     [25] 5-6 Years 2-3 Years 4-5 Years 0-1 Years 6-7 Years 1-2 Years
##     [31] 6-7 Years 0-1 Years 2-3 Years 0-1 Years 0-1 Years 6-7 Years
##     [37] 0-1 Years 4-5 Years 2-3 Years 0-1 Years 0-1 Years 6-7 Years
##     [43] 1-2 Years 6-7 Years 1-2 Years 5-6 Years 0-1 Years 0-1 Years
##     [49] 5-6 Years 6-7 Years 4-5 Years 1-2 Years 2-3 Years 0-1 Years
##     [55] 5-6 Years 1-2 Years 6-7 Years 6-7 Years 2-3 Years 6-7 Years
##     [61] 4-5 Years 5-6 Years 6-7 Years 1-2 Years 0-1 Years 0-1 Years
##     [67] 4-5 Years 2-3 Years 5-6 Years 0-1 Years 0-1 Years 5-6 Years
##     [73] 6-7 Years 6-7 Years 0-1 Years 5-6 Years 4-5 Years 0-1 Years
##     [79] 2-3 Years 4-5 Years 0-1 Years 0-1 Years 0-1 Years 4-5 Years
##     [85] 5-6 Years 0-1 Years 2-3 Years 4-5 Years 4-5 Years 2-3 Years
##     [91] 2-3 Years 0-1 Years 6-7 Years 6-7 Years 6-7 Years 0-1 Years
##     [97] 6-7 Years 0-1 Years 5-6 Years 2-3 Years 0-1 Years 0-1 Years
##    [103] 4-5 Years 6-7 Years 6-7 Years 0-1 Years 6-7 Years 2-3 Years
##    [109] 4-5 Years 6-7 Years 5-6 Years 5-6 Years 4-5 Years 4-5 Years
##    [115] 6-7 Years 0-1 Years 2-3 Years 0-1 Years 4-5 Years 2-3 Years
##    [121] 5-6 Years 0-1 Years 0-1 Years 0-1 Years 0-1 Years 2-3 Years
##    [127] 2-3 Years 6-7 Years 0-1 Years 6-7 Years 1-2 Years 2-3 Years
##    [133] 6-7 Years 0-1 Years 0-1 Years 4-5 Years 1-2 Years 6-7 Years
##    [139] 5-6 Years 0-1 Years 6-7 Years 0-1 Years 6-7 Years 6-7 Years
##    [145] 6-7 Years 6-7 Years 0-1 Years 0-1 Years 2-3 Years 1-2 Years
##    [151] 0-1 Years 0-1 Years 6-7 Years 6-7 Years 0-1 Years 1-2 Years
##    [157] 1-2 Years 1-2 Years 1-2 Years 0-1 Years 1-2 Years 1-2 Years
##    [163] 0-1 Years 5-6 Years 0-1 Years 6-7 Years 0-1 Years 6-7 Years
##    [169] 5-6 Years 1-2 Years 4-5 Years 0-1 Years 1-2 Years 5-6 Years
##    [175] 2-3 Years 2-3 Years 1-2 Years 0-1 Years 1-2 Years 6-7 Years
##    [181] 0-1 Years 0-1 Years 0-1 Years 2-3 Years 1-2 Years 0-1 Years
##    [187] 1-2 Years 0-1 Years 1-2 Years 4-5 Years 4-5 Years 0-1 Years
```

##	[193]	6-7 Years	6-7 Years	5-6 Years	1-2 Years	1-2 Years	5-6 Years
##	[199]	6-7 Years	0-1 Years	2-3 Years	1-2 Years	6-7 Years	1-2 Years
##	[205]	4-5 Years	2-3 Years	6-7 Years	0-1 Years	1-2 Years	6-7 Years
##	[211]	0-1 Years	0-1 Years	6-7 Years	2-3 Years	1-2 Years	5-6 Years
##	[217]	6-7 Years	6-7 Years	6-7 Years	0-1 Years	0-1 Years	6-7 Years
##	[223]	0-1 Years	0-1 Years	0-1 Years	1-2 Years	2-3 Years	0-1 Years
##	[229]	2-3 Years	4-5 Years	5-6 Years	5-6 Years	0-1 Years	6-7 Years
##	[235]	2-3 Years	0-1 Years	0-1 Years	1-2 Years	0-1 Years	1-2 Years
##	[241]	6-7 Years	6-7 Years	4-5 Years	6-7 Years	1-2 Years	0-1 Years
##	[247]	4-5 Years	1-2 Years	0-1 Years	4-5 Years	5-6 Years	0-1 Years
##	[253]	0-1 Years	2-3 Years	0-1 Years	6-7 Years	6-7 Years	5-6 Years
##	[259]	0-1 Years	2-3 Years	0-1 Years	1-2 Years	5-6 Years	2-3 Years
##	[265]	4-5 Years	6-7 Years	5-6 Years	1-2 Years	5-6 Years	6-7 Years
##	[271]	1-2 Years	5-6 Years	0-1 Years	1-2 Years	0-1 Years	0-1 Years
##	[277]	5-6 Years	1-2 Years	1-2 Years	0-1 Years	0-1 Years	0-1 Years
##	[283]	0-1 Years	6-7 Years	1-2 Years	1-2 Years	1-2 Years	0-1 Years
##	[289]	0-1 Years	0-1 Years	1-2 Years	2-3 Years	1-2 Years	0-1 Years
##	[295]	0-1 Years	0-1 Years	6-7 Years	2-3 Years	4-5 Years	0-1 Years
##	[301]	1-2 Years	0-1 Years	0-1 Years	6-7 Years	4-5 Years	5-6 Years
##	[307]	2-3 Years	2-3 Years	4-5 Years	4-5 Years	0-1 Years	1-2 Years
##	[313]	4-5 Years	0-1 Years	0-1 Years	5-6 Years	6-7 Years	4-5 Years
##	[319]	1-2 Years	2-3 Years	5-6 Years	6-7 Years	0-1 Years	0-1 Years
##	[325]	6-7 Years	5-6 Years	0-1 Years	0-1 Years	2-3 Years	1-2 Years
##	[331]	2-3 Years	0-1 Years	4-5 Years	0-1 Years	0-1 Years	6-7 Years
##	[337]	4-5 Years	6-7 Years	2-3 Years	6-7 Years	2-3 Years	6-7 Years
##	[343]	6-7 Years	6-7 Years	4-5 Years	0-1 Years	0-1 Years	6-7 Years
##	[349]	1-2 Years	6-7 Years	4-5 Years	1-2 Years	0-1 Years	0-1 Years
##	[355]	1-2 Years	0-1 Years	1-2 Years	6-7 Years	2-3 Years	4-5 Years
##	[361]	0-1 Years	4-5 Years	5-6 Years	4-5 Years	1-2 Years	0-1 Years
##	[367]	1-2 Years	0-1 Years	6-7 Years	6-7 Years	2-3 Years	0-1 Years
##	[373]	1-2 Years	5-6 Years	4-5 Years	4-5 Years	0-1 Years	2-3 Years
##	[379]	6-7 Years	1-2 Years	4-5 Years	0-1 Years	6-7 Years	0-1 Years
##	[385]	4-5 Years	0-1 Years	5-6 Years	4-5 Years	4-5 Years	0-1 Years
##	[391]	2-3 Years	2-3 Years	0-1 Years	1-2 Years	4-5 Years	6-7 Years
##	[397]	2-3 Years	2-3 Years	2-3 Years	1-2 Years	2-3 Years	0-1 Years
##	[403]	6-7 Years	6-7 Years	1-2 Years	6-7 Years	5-6 Years	2-3 Years
##	[409]	0-1 Years	0-1 Years	0-1 Years	4-5 Years	2-3 Years	5-6 Years
##	[415]	4-5 Years	1-2 Years	6-7 Years	4-5 Years	1-2 Years	0-1 Years
##	[421]	0-1 Years	0-1 Years	2-3 Years	4-5 Years	0-1 Years	5-6 Years
##	[427]	5-6 Years	0-1 Years	1-2 Years	6-7 Years	6-7 Years	6-7 Years
##	[433]	0-1 Years	0-1 Years	4-5 Years	2-3 Years	2-3 Years	6-7 Years
##	[439]	2-3 Years	0-1 Years	1-2 Years	5-6 Years	5-6 Years	1-2 Years
##	[445]	2-3 Years	5-6 Years	0-1 Years	5-6 Years	0-1 Years	6-7 Years
##	[451]	6-7 Years	1-2 Years	5-6 Years	2-3 Years	6-7 Years	1-2 Years
##	[457]	2-3 Years	2-3 Years	0-1 Years	0-1 Years	0-1 Years	1-2 Years
##	[463]	0-1 Years	0-1 Years	6-7 Years	6-7 Years	6-7 Years	6-7 Years
##	[469]	4-5 Years	1-2 Years	1-2 Years	0-1 Years	0-1 Years	1-2 Years
##	[475]	0-1 Years	1-2 Years	2-3 Years	0-1 Years	0-1 Years	1-2 Years
##	[481]	0-1 Years	4-5 Years	1-2 Years	6-7 Years	0-1 Years	6-7 Years
##	[487]	1-2 Years	6-7 Years	0-1 Years	0-1 Years	6-7 Years	0-1 Years

##	[493]	0-1 Years	6-7 Years	0-1 Years	1-2 Years	2-3 Years	6-7 Years
##	[499]	0-1 Years	0-1 Years	2-3 Years	6-7 Years	6-7 Years	5-6 Years
##	[505]	6-7 Years	1-2 Years	0-1 Years	0-1 Years	0-1 Years	0-1 Years
##	[511]	1-2 Years	6-7 Years	0-1 Years	5-6 Years	2-3 Years	4-5 Years
##	[517]	2-3 Years	0-1 Years	2-3 Years	0-1 Years	6-7 Years	2-3 Years
##	[523]	5-6 Years	1-2 Years	2-3 Years	5-6 Years	6-7 Years	5-6 Years
##	[529]	2-3 Years	5-6 Years	1-2 Years	6-7 Years	0-1 Years	6-7 Years
##	[535]	0-1 Years	0-1 Years	6-7 Years	2-3 Years	6-7 Years	5-6 Years
##	[541]	6-7 Years	0-1 Years	0-1 Years	0-1 Years	1-2 Years	2-3 Years
##	[547]	4-5 Years	6-7 Years	5-6 Years	1-2 Years	6-7 Years	6-7 Years
##	[553]	5-6 Years	1-2 Years	2-3 Years	5-6 Years	0-1 Years	4-5 Years
##	[559]	0-1 Years	0-1 Years	5-6 Years	0-1 Years	0-1 Years	5-6 Years
##	[565]	0-1 Years	6-7 Years	1-2 Years	6-7 Years	2-3 Years	0-1 Years
##	[571]	5-6 Years	4-5 Years	0-1 Years	5-6 Years	2-3 Years	6-7 Years
##	[577]	2-3 Years	0-1 Years	2-3 Years	0-1 Years	0-1 Years	0-1 Years
##	[583]	0-1 Years	0-1 Years	0-1 Years	0-1 Years	5-6 Years	0-1 Years
##	[589]	6-7 Years	6-7 Years	6-7 Years	4-5 Years	6-7 Years	2-3 Years
##	[595]	0-1 Years	0-1 Years	1-2 Years	0-1 Years	5-6 Years	6-7 Years
##	[601]	1-2 Years	0-1 Years	6-7 Years	4-5 Years	2-3 Years	6-7 Years
##	[607]	4-5 Years	5-6 Years	6-7 Years	6-7 Years	0-1 Years	0-1 Years
##	[613]	6-7 Years	4-5 Years	5-6 Years	1-2 Years	0-1 Years	6-7 Years
##	[619]	5-6 Years	0-1 Years	0-1 Years	6-7 Years	4-5 Years	1-2 Years
##	[625]	0-1 Years	2-3 Years	1-2 Years	6-7 Years	6-7 Years	5-6 Years
##	[631]	4-5 Years	4-5 Years	6-7 Years	0-1 Years	4-5 Years	6-7 Years
##	[637]	2-3 Years	6-7 Years	5-6 Years	0-1 Years	6-7 Years	4-5 Years
##	[643]	0-1 Years	5-6 Years	1-2 Years	1-2 Years	0-1 Years	5-6 Years
##	[649]	0-1 Years	1-2 Years	0-1 Years	0-1 Years	2-3 Years	1-2 Years
##	[655]	0-1 Years	0-1 Years	6-7 Years	4-5 Years	0-1 Years	4-5 Years
##	[661]	0-1 Years	0-1 Years	0-1 Years	6-7 Years	5-6 Years	0-1 Years
##	[667]	0-1 Years	5-6 Years	0-1 Years	6-7 Years	5-6 Years	5-6 Years
##	[673]	0-1 Years	1-2 Years	5-6 Years	6-7 Years	4-5 Years	0-1 Years
##	[679]	0-1 Years	4-5 Years	0-1 Years	6-7 Years	0-1 Years	4-5 Years
##	[685]	0-1 Years	0-1 Years	5-6 Years	0-1 Years	5-6 Years	5-6 Years
##	[691]	0-1 Years	2-3 Years	4-5 Years	0-1 Years	1-2 Years	0-1 Years
##	[697]	6-7 Years	0-1 Years	4-5 Years	6-7 Years	6-7 Years	2-3 Years
##	[703]	2-3 Years	0-1 Years	0-1 Years	2-3 Years	6-7 Years	2-3 Years
##	[709]	2-3 Years	2-3 Years	0-1 Years	1-2 Years	5-6 Years	1-2 Years
##	[715]	6-7 Years	4-5 Years	6-7 Years	2-3 Years	2-3 Years	6-7 Years
##	[721]	0-1 Years	6-7 Years	0-1 Years	0-1 Years	2-3 Years	0-1 Years
##	[727]	1-2 Years	0-1 Years	2-3 Years	6-7 Years	4-5 Years	0-1 Years
##	[733]	2-3 Years	6-7 Years	2-3 Years	2-3 Years	2-3 Years	6-7 Years
##	[739]	4-5 Years	6-7 Years	4-5 Years	0-1 Years	0-1 Years	6-7 Years
##	[745]	0-1 Years	6-7 Years	6-7 Years	0-1 Years	4-5 Years	6-7 Years
##	[751]	2-3 Years	6-7 Years	0-1 Years	0-1 Years	0-1 Years	1-2 Years
##	[757]	6-7 Years	0-1 Years	1-2 Years	6-7 Years	0-1 Years	1-2 Years
##	[763]	0-1 Years	6-7 Years	6-7 Years	0-1 Years	1-2 Years	1-2 Years
##	[769]	4-5 Years	1-2 Years	0-1 Years	1-2 Years	0-1 Years	0-1 Years
##	[775]	2-3 Years	6-7 Years	0-1 Years	0-1 Years	5-6 Years	0-1 Years
##	[781]	6-7 Years	0-1 Years	2-3 Years	0-1 Years	6-7 Years	4-5 Years
##	[787]	6-7 Years	2-3 Years	1-2 Years	6-7 Years	5-6 Years	6-7 Years

##	[793]	0-1 Years	2-3 Years	0-1 Years	0-1 Years	2-3 Years	1-2 Years
##	[799]	0-1 Years	6-7 Years	6-7 Years	0-1 Years	4-5 Years	4-5 Years
##	[805]	0-1 Years	6-7 Years	1-2 Years	6-7 Years	4-5 Years	0-1 Years
##	[811]	5-6 Years	6-7 Years	4-5 Years	2-3 Years	0-1 Years	2-3 Years
##	[817]	0-1 Years	5-6 Years	1-2 Years	6-7 Years	6-7 Years	4-5 Years
##	[823]	4-5 Years	0-1 Years	6-7 Years	1-2 Years	0-1 Years	1-2 Years
##	[829]	5-6 Years	2-3 Years	5-6 Years	4-5 Years	6-7 Years	4-5 Years
##	[835]	0-1 Years	5-6 Years	6-7 Years	0-1 Years	2-3 Years	4-5 Years
##	[841]	5-6 Years	6-7 Years	0-1 Years	1-2 Years	0-1 Years	1-2 Years
##	[847]	6-7 Years	0-1 Years	6-7 Years	6-7 Years	6-7 Years	5-6 Years
##	[853]	0-1 Years	0-1 Years	6-7 Years	6-7 Years	6-7 Years	0-1 Years
##	[859]	6-7 Years	6-7 Years	2-3 Years	6-7 Years	1-2 Years	0-1 Years
##	[865]	1-2 Years	0-1 Years	6-7 Years	0-1 Years	5-6 Years	0-1 Years
##	[871]	6-7 Years	5-6 Years	6-7 Years	5-6 Years	4-5 Years	0-1 Years
##	[877]	1-2 Years	5-6 Years	5-6 Years	2-3 Years	0-1 Years	2-3 Years
##	[883]	0-1 Years	6-7 Years	5-6 Years	0-1 Years	0-1 Years	2-3 Years
##	[889]	4-5 Years	6-7 Years	2-3 Years	5-6 Years	2-3 Years	0-1 Years
##	[895]	6-7 Years	2-3 Years	6-7 Years	5-6 Years	0-1 Years	5-6 Years
##	[901]	0-1 Years	0-1 Years	1-2 Years	5-6 Years	6-7 Years	0-1 Years
##	[907]	0-1 Years	1-2 Years	0-1 Years	6-7 Years	0-1 Years	1-2 Years
##	[913]	6-7 Years	0-1 Years	6-7 Years	0-1 Years	1-2 Years	6-7 Years
##	[919]	2-3 Years	1-2 Years	5-6 Years	0-1 Years	1-2 Years	6-7 Years
##	[925]	1-2 Years	2-3 Years	0-1 Years	1-2 Years	6-7 Years	2-3 Years
##	[931]	1-2 Years	2-3 Years	6-7 Years	0-1 Years	0-1 Years	0-1 Years
##	[937]	0-1 Years	0-1 Years	6-7 Years	1-2 Years	1-2 Years	1-2 Years
##	[943]	1-2 Years	6-7 Years	5-6 Years	0-1 Years	0-1 Years	2-3 Years
##	[949]	2-3 Years	2-3 Years	0-1 Years	0-1 Years	1-2 Years	1-2 Years
##	[955]	1-2 Years	0-1 Years	6-7 Years	0-1 Years	2-3 Years	2-3 Years
##	[961]	0-1 Years	1-2 Years	0-1 Years	5-6 Years	0-1 Years	0-1 Years
##	[967]	0-1 Years	0-1 Years	6-7 Years	0-1 Years	0-1 Years	5-6 Years
##	[973]	5-6 Years	4-5 Years	5-6 Years	6-7 Years	0-1 Years	0-1 Years
##	[979]	6-7 Years	2-3 Years	1-2 Years	4-5 Years	4-5 Years	0-1 Years
##	[985]	6-7 Years	2-3 Years	0-1 Years	0-1 Years	2-3 Years	2-3 Years
##	[991]	5-6 Years	5-6 Years	1-2 Years	0-1 Years	1-2 Years	2-3 Years
##	[997]	2-3 Years	0-1 Years	6-7 Years	0-1 Years	0-1 Years	2-3 Years
##	[1003]	0-1 Years	4-5 Years	1-2 Years	5-6 Years	1-2 Years	0-1 Years
##	[1009]	2-3 Years	1-2 Years	0-1 Years	6-7 Years	0-1 Years	0-1 Years
##	[1015]	1-2 Years	0-1 Years	6-7 Years	6-7 Years	0-1 Years	1-2 Years
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##	[1063]	2-3 Years	0-1 Years	1-2 Years	1-2 Years	4-5 Years	1-2 Years
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##	[1075]	0-1 Years	5-6 Years	5-6 Years	4-5 Years	5-6 Years	0-1 Years
##	[1081]	2-3 Years	4-5 Years	0-1 Years	0-1 Years	5-6 Years	1-2 Years
##	[1087]	0-1 Years	2-3 Years	1-2 Years	1-2 Years	5-6 Years	2-3 Years



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## [1807] 2-3 Years 0-1 Years 1-2 Years 2-3 Years 6-7 Years 1-2 Years  
## [1813] 1-2 Years 0-1 Years 0-1 Years 6-7 Years 0-1 Years 6-7 Years  
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## [1879] 0-1 Years 0-1 Years 0-1 Years 2-3 Years 2-3 Years 2-3 Years  
## [1885] 2-3 Years 1-2 Years 6-7 Years 1-2 Years 1-2 Years 1-2 Years  
## [1891] 0-1 Years 0-1 Years 0-1 Years 1-2 Years 4-5 Years 6-7 Years  
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## [1957] 6-7 Years 4-5 Years 1-2 Years 0-1 Years 2-3 Years 4-5 Years  
## [1963] 1-2 Years 0-1 Years 6-7 Years 1-2 Years 1-2 Years 6-7 Years  
## [1969] 5-6 Years 5-6 Years 0-1 Years 1-2 Years 1-2 Years 6-7 Years  
## [1975] 0-1 Years 1-2 Years 0-1 Years 2-3 Years 5-6 Years 4-5 Years  
## [1981] 0-1 Years 5-6 Years 1-2 Years 2-3 Years 1-2 Years 0-1 Years  
## [1987] 6-7 Years 2-3 Years 5-6 Years 2-3 Years 1-2 Years 4-5 Years

##	[1993]	1-2 Years	0-1 Years	1-2 Years	0-1 Years	6-7 Years	6-7 Years
##	[1999]	0-1 Years	1-2 Years	0-1 Years	0-1 Years	5-6 Years	5-6 Years
##	[2005]	1-2 Years	5-6 Years	0-1 Years	0-1 Years	0-1 Years	6-7 Years
##	[2011]	0-1 Years	5-6 Years	4-5 Years	2-3 Years	1-2 Years	2-3 Years
##	[2017]	0-1 Years	4-5 Years	0-1 Years	6-7 Years	5-6 Years	6-7 Years
##	[2023]	1-2 Years	0-1 Years	0-1 Years	6-7 Years	6-7 Years	1-2 Years
##	[2029]	1-2 Years	6-7 Years	0-1 Years	0-1 Years	1-2 Years	0-1 Years
##	[2035]	4-5 Years	4-5 Years	0-1 Years	0-1 Years	2-3 Years	1-2 Years
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##	[2053]	4-5 Years	4-5 Years	0-1 Years	4-5 Years	5-6 Years	1-2 Years
##	[2059]	6-7 Years	4-5 Years	6-7 Years	0-1 Years	6-7 Years	5-6 Years
##	[2065]	2-3 Years	2-3 Years	6-7 Years	6-7 Years	4-5 Years	0-1 Years
##	[2071]	5-6 Years	6-7 Years	4-5 Years	1-2 Years	4-5 Years	5-6 Years
##	[2077]	1-2 Years	0-1 Years	1-2 Years	6-7 Years	6-7 Years	1-2 Years
##	[2083]	1-2 Years	0-1 Years	0-1 Years	2-3 Years	1-2 Years	0-1 Years
##	[2089]	2-3 Years	5-6 Years	4-5 Years	5-6 Years	6-7 Years	0-1 Years
##	[2095]	1-2 Years	0-1 Years	0-1 Years	0-1 Years	0-1 Years	4-5 Years
##	[2101]	6-7 Years	4-5 Years	1-2 Years	0-1 Years	0-1 Years	0-1 Years
##	[2107]	5-6 Years	2-3 Years	4-5 Years	2-3 Years	0-1 Years	2-3 Years
##	[2113]	2-3 Years	4-5 Years	4-5 Years	6-7 Years	0-1 Years	6-7 Years
##	[2119]	1-2 Years	4-5 Years	5-6 Years	0-1 Years	0-1 Years	2-3 Years
##	[2125]	0-1 Years	6-7 Years	0-1 Years	4-5 Years	4-5 Years	0-1 Years
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##	[2137]	1-2 Years	0-1 Years	5-6 Years	0-1 Years	2-3 Years	1-2 Years
##	[2143]	1-2 Years	2-3 Years	0-1 Years	0-1 Years	6-7 Years	1-2 Years
##	[2149]	0-1 Years	4-5 Years	1-2 Years	6-7 Years	0-1 Years	2-3 Years
##	[2155]	1-2 Years	2-3 Years	0-1 Years	5-6 Years	5-6 Years	1-2 Years
##	[2161]	6-7 Years	0-1 Years	2-3 Years	2-3 Years	6-7 Years	1-2 Years
##	[2167]	5-6 Years	1-2 Years	0-1 Years	6-7 Years	1-2 Years	0-1 Years
##	[2173]	0-1 Years	0-1 Years	1-2 Years	2-3 Years	6-7 Years	6-7 Years
##	[2179]	5-6 Years	0-1 Years	6-7 Years	5-6 Years	5-6 Years	0-1 Years
##	[2185]	0-1 Years	1-2 Years	4-5 Years	6-7 Years	2-3 Years	6-7 Years
##	[2191]	6-7 Years	0-1 Years	5-6 Years	5-6 Years	0-1 Years	2-3 Years
##	[2197]	1-2 Years	6-7 Years	1-2 Years	5-6 Years	1-2 Years	2-3 Years
##	[2203]	0-1 Years	6-7 Years	6-7 Years	2-3 Years	5-6 Years	0-1 Years
##	[2209]	0-1 Years	0-1 Years	6-7 Years	5-6 Years	0-1 Years	0-1 Years
##	[2215]	1-2 Years	6-7 Years	6-7 Years	6-7 Years	6-7 Years	1-2 Years
##	[2221]	6-7 Years	6-7 Years	4-5 Years	2-3 Years	1-2 Years	2-3 Years
##	[2227]	1-2 Years	5-6 Years	6-7 Years	0-1 Years	4-5 Years	0-1 Years
##	[2233]	2-3 Years	5-6 Years	1-2 Years	4-5 Years	0-1 Years	2-3 Years
##	[2239]	0-1 Years	6-7 Years	6-7 Years	5-6 Years	4-5 Years	6-7 Years
##	[2245]	2-3 Years	6-7 Years	0-1 Years	4-5 Years	2-3 Years	0-1 Years
##	[2251]	1-2 Years	0-1 Years	6-7 Years	6-7 Years	6-7 Years	0-1 Years
##	[2257]	1-2 Years	5-6 Years	5-6 Years	0-1 Years	0-1 Years	5-6 Years
##	[2263]	0-1 Years	0-1 Years	6-7 Years	0-1 Years	5-6 Years	6-7 Years
##	[2269]	4-5 Years	0-1 Years	0-1 Years	4-5 Years	0-1 Years	2-3 Years
##	[2275]	1-2 Years	0-1 Years	4-5 Years	6-7 Years	0-1 Years	6-7 Years
##	[2281]	0-1 Years	1-2 Years	6-7 Years	0-1 Years	0-1 Years	5-6 Years
##	[2287]	0-1 Years	6-7 Years	0-1 Years	6-7 Years	1-2 Years	0-1 Years

## [2293] 5-6 Years 6-7 Years 0-1 Years 0-1 Years 0-1 Years 5-6 Years  
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## [2329] 2-3 Years 5-6 Years 2-3 Years 2-3 Years 4-5 Years 5-6 Years  
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## [6931] 0-1 Years 5-6 Years 0-1 Years 0-1 Years 6-7 Years 6-7 Years
## [6937] 0-1 Years 2-3 Years 6-7 Years 2-3 Years 6-7 Years 6-7 Years
## [6943] 6-7 Years 0-1 Years 0-1 Years 6-7 Years 4-5 Years 6-7 Years
## [6949] 4-5 Years 2-3 Years 0-1 Years 5-6 Years 4-5 Years 1-2 Years
## [6955] 1-2 Years 0-1 Years 6-7 Years 0-1 Years 1-2 Years 4-5 Years
## [6961] 4-5 Years 1-2 Years 2-3 Years 0-1 Years 5-6 Years 6-7 Years
## [6967] 5-6 Years 2-3 Years 1-2 Years 0-1 Years 0-1 Years 1-2 Years
## [6973] 5-6 Years 5-6 Years 5-6 Years 1-2 Years 6-7 Years 1-2 Years
## [6979] 6-7 Years 0-1 Years 1-2 Years 0-1 Years 6-7 Years 1-2 Years
## [6985] 2-3 Years 4-5 Years 2-3 Years 2-3 Years 1-2 Years 1-2 Years
## [6991] 2-3 Years 0-1 Years 6-7 Years 5-6 Years 4-5 Years 5-6 Years
## [6997] 4-5 Years 2-3 Years 1-2 Years 0-1 Years 6-7 Years 0-1 Years
## [7003] 6-7 Years 2-3 Years 4-5 Years 1-2 Years 4-5 Years 6-7 Years
## [7009] 0-1 Years 1-2 Years 0-1 Years 0-1 Years 6-7 Years 4-5 Years
## [7015] 4-5 Years 2-3 Years 0-1 Years 5-6 Years 0-1 Years 4-5 Years
## [7021] 0-1 Years 0-1 Years 6-7 Years 6-7 Years 4-5 Years 1-2 Years
## [7027] 0-1 Years 1-2 Years 6-7 Years 0-1 Years 0-1 Years 5-6 Years
## [7033] 0-1 Years 4-5 Years 6-7 Years 1-2 Years 0-1 Years 6-7 Years
## [7039] 1-2 Years 6-7 Years 0-1 Years 0-1 Years 6-7 Years
## Levels: 0-1 Years 1-2 Years 2-3 Years 4-5 Years 5-6 Years 6-7 Years
```

```
tablechurn$Tenure_Range <- cut(tablechurn$Tenure_Range,6,labels = c('0-1 Year
s','1-2 Years','2-3 Years','4-5 Years','5-6 Years','6-7 Years'))
```

```
#Checking if there are any NULL values in any of the columns
table(is.na(tablechurn))
```

```

##
## FALSE TRUE
## 154935 11

str_detect(tablechurn, 'NA')

## Warning in stri_detect_regex(string, pattern, negate = negate, opts_regex
=
## opts(pattern)): argument is not an atomic vector; coercing
## [1] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
## [12] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE

setDT(tablechurn)
tablechurn[is.na(TotalCharges), NROW(TotalCharges)]

## [1] 11

#There are 11 rows out of 7043 rows that have null values.Hence removing thes
e rows since they are only 0.15% of total so we can afford to drop them

tablechurn <- tablechurn[complete.cases(tablechurn), ]

#Replacing 'No Internet Service' values in OnlineSecurity,OnlineBackup Device
Protection,TechSupport,StreamingTV and StreamingMovies columns with 'No'

tablechurn$OnlineSecurity[tablechurn$OnlineSecurity=='No internet service'] <-
'No'
tablechurn$OnlineBackup[tablechurn$OnlineBackup=='No internet service'] <- 'N
o'
tablechurn$DeviceProtection[tablechurn$DeviceProtection=='No internet service
'] <- 'No'
tablechurn$TechSupport[tablechurn$TechSupport=='No internet service'] <- 'No'
tablechurn$StreamingTV[tablechurn$StreamingTV=='No internet service'] <- 'No'
tablechurn$StreamingMovies[tablechurn$StreamingMovies=='No internet service']
<- 'No'

#Deleting the unused levels from the factor variables

tablechurn$OnlineSecurity <- factor(tablechurn$OnlineSecurity)
tablechurn$OnlineBackup <- factor(tablechurn$OnlineBackup)
tablechurn$DeviceProtection <- factor(tablechurn$DeviceProtection)
tablechurn$TechSupport <- factor(tablechurn$TechSupport)
tablechurn$StreamingTV <- factor(tablechurn$StreamingTV)

library(data.table)

##-----Factor Analysis-----
-----

## Creating new data frame for numerical values for doing Factor Analysis

```

```
tablechurnFA = data.frame(tablechurn$MonthlyCharges,tablechurn$TotalCharges,t
ablechurn$Tenure)
setDT(tablechurnFA)
```

*##Setting column names for our new dataframe*

```
names(tablechurnFA) <- c('MonthlyCharges','TotalCharges','Tenure')
```

*##head(tablechurnFA)*

```
tablechurnFA
```

```
##      MonthlyCharges TotalCharges Tenure
## 1:          29.85         29.85      1
## 2:          56.95        1889.50     34
## 3:          53.85         108.15      2
## 4:          42.30        1840.75     45
## 5:          70.70         151.65      2
## ---
## 7028:         84.80        1990.50     24
## 7029:        103.20        7362.90     72
## 7030:         29.60         346.45     11
## 7031:         74.40         306.60      4
## 7032:        105.65        6844.50     66
```

```
library(psych)
```

*##Since we have 3 columns that we are considering for factor analysis , we are checking*

*#how will the variance be distributed across 3 factors and if we really need 3 factors*

*#for our analysis.*

```
fit.pc <- principal(tablechurnFA, nfactors=3, rotate="varimax")
fit.pc
```

*## Principal Components Analysis*

*## Call: principal(r = tablechurnFA, nfactors = 3, rotate = "varimax")*

*## Standardized loadings (pattern matrix) based upon correlation matrix*

```
##           RC1  RC2  RC3 h2      u2 com
## MonthlyCharges 0.15 0.98 0.09 1 0.0e+00 1.1
## TotalCharges   0.77 0.51 0.39 1 -1.3e-15 2.3
## Tenure          0.99 0.10 0.04 1 -2.0e-15 1.0
##
```

```
##           RC1  RC2  RC3
## SS loadings    1.60 1.24 0.16
## Proportion Var 0.53 0.41 0.05
## Cumulative Var 0.53 0.95 1.00
## Proportion Explained 0.53 0.41 0.05
## Cumulative Proportion 0.53 0.95 1.00
##
```

```

## Mean item complexity = 1.5
## Test of the hypothesis that 3 components are sufficient.
##
## The root mean square of the residuals (RMSR) is 0
## with the empirical chi square 0 with prob < NA
##
## Fit based upon off diagonal values = 1

round(fit.pc$values, 3)

## [1] 2.180 0.761 0.059

fit.pc$loadings

##
## Loadings:
##           RC1   RC2   RC3
## MonthlyCharges 0.151 0.985
## TotalCharges   0.767 0.509 0.391
## Tenure         0.995
##
##           RC1   RC2   RC3
## SS loadings   1.600 1.238 0.162
## Proportion Var 0.533 0.413 0.054
## Cumulative Var 0.533 0.946 1.000

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

## [1] 0.150739
## [1] 0.984762
## [1] 0.08672656

# Communalities
fit.pc$communality

## MonthlyCharges   TotalCharges      Tenure
##           1           1           1

# Rotated factor scores, Notice the columns ordering
fit.pc$scores

##           RC1           RC2           RC3
## [1,] -1.2311067538 -1.1068588544 1.313981e+00
## [2,] 0.1006912229 -0.2527791841 -3.125931e-01
## [3,] -1.2355277231 -0.2006592146 2.299921e-01
## [4,] 0.6167293819 -0.7944116945 -6.740261e-01
## [5,] -1.2692030906 0.4361767857 -4.848300e-01
## [6,] -1.0860264883 1.4689688002 -1.435217e+00
## [7,] -0.4931440465 0.9531244022 -6.517006e-01
## [8,] -0.8441184221 -1.1326139027 8.954768e-01
## [9,] -0.3023273640 1.4328381797 -4.133605e-01

```

```
## [10,] 1.2749111148 -0.4366656911 -5.721077e-01
## [11,] -0.7613759229 -0.3926387040 9.107749e-02
## [12,] -0.5594245132 -1.5408678629 8.971746e-01
## [13,] 0.9249512291 0.9945523412 7.246874e-01
## [14,] 0.5470104933 1.1862868451 4.883715e-01
## [15,] -0.4216029521 1.4973027366 -6.697538e-01
## [16,] 1.2965533840 1.2460438599 2.167117e+00
## [17,] 1.0005407110 -1.5195233901 -1.405028e+00
## [18,] 1.4182909366 1.0566067916 1.596247e+00
## [19,] -0.9015365077 -0.1889436375 3.384503e-02
## [20,] -0.5356255381 0.9981156178 -7.246407e-01
## [21,] -1.2500603518 -0.7347188562 8.772166e-01
## [22,] -0.7327960606 -1.4983282952 1.041247e+00
## [23,] -1.2123465599 -1.4752015057 1.746289e+00
## [24,] 1.0902706049 -0.2997161385 -3.690255e-01
## [25,] 0.7147544860 -0.2594507270 -2.885234e-01
## [26,] -0.0583904122 -0.2789263398 -3.715634e-01
## [27,] 0.4785354110 1.0511500856 4.746937e-01
## [28,] -1.2317836680 -1.0935681402 1.298383e+00
## [29,] 1.5349472715 0.5457201139 8.900128e-01
## [30,] -0.6330804484 0.1158308365 -2.525191e-01
## [31,] 1.4629780341 0.7320657166 1.237021e+00
## [32,] -1.3173793530 1.3773301477 -1.583059e+00
## [33,] -0.2255855023 0.0924375126 -1.394434e-01
## [34,] -1.2124432619 -1.4733028323 1.744061e+00
## [35,] -1.2608909792 -0.5220674286 6.276368e-01
## [36,] 1.4806992725 0.8133800146 1.643455e+00
## [37,] -1.1414176463 0.3823332110 -4.788022e-01
## [38,] 0.5297751070 0.2510828403 6.140810e-02
## [39,] -0.0605202331 1.4408079501 -3.300998e-01
## [40,] -0.9616057458 1.3711107154 -1.230167e+00
## [41,] -0.8886925248 -0.3981730285 2.219064e-01
## [42,] 1.5474312370 -0.0884898086 2.193098e-03
## [43,] -0.5223513490 -1.4816810926 8.505371e-01
## [44,] 1.2182400473 0.3114827607 1.143816e-01
## [45,] -0.8271412830 0.5625331363 -5.800428e-01
## [46,] 0.6294260311 0.5829008424 -1.619800e-01
## [47,] -1.2263640282 -0.3745956697 4.261203e-01
## [48,] -1.2877351861 0.8159882594 -9.519477e-01
## [49,] 0.7583634604 0.3697210512 2.140822e-01
## [50,] 1.5379940012 -0.2118210395 -5.164234e-01
## [51,] 0.3560486621 0.8036906338 9.849758e-03
## [52,] -0.8002212497 1.3863137309 -1.204231e+00
## [53,] -0.3153816425 0.2318494459 -2.824702e-01
## [54,] -1.0424205440 0.7665142350 -8.165608e-01
## [55,] 1.1115952173 0.1639588830 5.858612e-02
## [56,] -0.6739801441 1.2133255238 -8.582730e-01
## [57,] 1.1216328804 0.9014776766 1.171403e+00
## [58,] 1.2064005305 1.1529708868 1.541029e+00
## [59,] 0.2018596849 -1.3588896038 -1.928265e-01
```



```
## [60,] 1.4417610143 1.0346883789 2.110934e+00
## [61,] 0.4780729543 1.0997101002 3.648478e-01
## [62,] 1.0425521878 0.6245963734 7.160810e-01
## [63,] 1.7650631154 -0.9024075047 -1.520320e+00
## [64,] -0.5638234496 -0.2600823299 -5.196865e-02
## [65,] -1.0333751774 1.2658369069 -1.232280e+00
## [66,] -1.2374718364 0.6018930416 -6.586989e-01
## [67,] 0.5620615050 0.3966689750 -7.647803e-02
## [68,] -0.0988468062 0.5229032117 -2.461443e-01
## [69,] 0.9168204238 -1.5301130550 -1.330897e+00
## [70,] -0.9628453554 0.7092517525 -6.112676e-01
## [71,] -1.2682403335 -0.3777682457 4.582790e-01
## [72,] 0.9982532295 -1.5367091458 -1.301725e+00
## [73,] 1.1110923915 1.2684127919 1.603107e+00
## [74,] 1.4194492598 -1.4180458159 -1.905683e+00
## [75,] -1.2143046035 0.1981078230 -2.531844e-01
## [76,] 0.7986204403 1.3272712019 1.056311e+00
## [77,] 0.6010793023 -0.3809815909 -2.248307e-01
## [78,] -0.9870359665 -0.2066394793 1.725956e-01
## [79,] -0.1188951993 0.3961204333 -4.771751e-01
## [80,] 0.6732316087 -1.3483752798 -7.674150e-01
## [81,] -1.3268417640 0.7728278713 -8.921264e-01
## [82,] -0.8500313482 -0.3692518270 2.095668e-01
## [83,] -1.0706555887 0.5714954009 -6.609703e-01
## [84,] 0.2662534698 1.2634518692 1.384864e-01
## [85,] 0.8708789668 -1.5359021722 -1.185312e+00
## [86,] -1.0451601165 1.4454994125 -1.373895e+00
## [87,] 0.1217644230 -0.0906446633 -1.973165e-01
## [88,] 0.8223107491 -1.5273120633 -1.006809e+00
## [89,] 0.7405126319 -1.5412341936 -9.748292e-01
## [90,] -0.0405404142 -1.0416574408 -1.004399e-03
## [91,] -0.1514298811 0.6222026590 -1.900078e-01
## [92,] -1.3178484752 0.5962512395 -6.848860e-01
## [93,] 1.3082370050 0.3759503701 8.164355e-01
## [94,] 1.1560177979 1.2475429646 1.551206e+00
## [95,] 1.4703503075 0.8279933024 1.878763e+00
## [96,] -0.8743519114 0.6724124746 -6.917017e-01
## [97,] 1.6011331815 -0.1630120038 -1.456029e-01
## [98,] -1.0410301601 -1.4475969672 1.480008e+00
## [99,] 0.9964423664 -1.5157307095 -1.306832e+00
## [100,] -0.4013543416 1.2501165978 -5.809608e-01
## [101,] -1.2124432619 -1.4733028323 1.744061e+00
## [102,] -1.2109927315 -1.5017829342 1.777487e+00
## [103,] 0.1355117388 1.0060789765 -8.446909e-02
## [104,] 1.4906083685 -0.7842961865 -1.062204e+00
## [105,] 1.2700490643 1.1533500955 2.020135e+00
## [106,] -1.0466266124 -1.3222700007 1.312240e+00
## [107,] 1.4705588685 0.9694352280 1.517924e+00
## [108,] 0.1022340169 -1.1665813239 -2.103805e-01
## [109,] 0.3449199154 0.9505008000 -6.647533e-02
```

```
## [110,] 1.8732369378 -1.5859859974 -2.646253e+00
## [111,] 0.8171687669 0.9045497744 5.542788e-01
## [112,] 0.8475753109 -0.3274884654 -3.791893e-01
## [113,] 0.3486941400 0.8439535989 1.020071e-01
## [114,] 0.1563998195 0.3839761824 -1.470787e-01
## [115,] 1.3688946349 -0.4864368791 -7.643583e-01
## [116,] -1.2651941337 1.1555673862 -1.321063e+00
## [117,] 0.2692685313 -1.1508634781 -3.342490e-01
## [118,] -1.0086981441 1.4661484091 -1.307645e+00
## [119,] 0.5218852982 -1.5090816596 -6.916433e-01
## [120,] -0.2729542582 0.7866134782 -6.383953e-01
## [121,] 0.8443270028 0.9903903481 7.012903e-01
## [122,] -0.9961123091 -1.4598192793 1.406580e+00
## [123,] -1.2351745547 0.5692621894 -6.371015e-01
## [124,] -1.0183890747 -0.3431333957 2.631070e-01
## [125,] -1.0827841258 -1.4504299233 1.508097e+00
## [126,] -0.0505170722 0.8361648553 -1.504650e-01
## [127,] -0.2587608880 0.5161163724 -3.318743e-01
## [128,] 1.8506706097 -1.4687599126 -2.347615e+00
## [129,] -1.2115729437 -1.4903908934 1.764117e+00
## [130,] 1.6519524005 -0.4726971758 -7.033360e-01
## [131,] -0.8551512188 0.9073652402 -7.101539e-01
## [132,] -0.2845501349 -0.1549936709 -1.209761e-01
## [133,] 1.5158568259 -0.6192394666 -1.064015e+00
## [134,] -1.2419373812 -0.8942074269 1.064402e+00
## [135,] -1.2164447677 -0.5594373773 6.297867e-01
## [136,] 0.5863477051 -1.3547445418 -6.207312e-01
## [137,] -0.4152694398 0.4364327780 -3.239738e-01
## [138,] 1.5215261923 -1.5537054697 -2.094884e+00
## [139,] 1.2175612866 -1.5713062079 -1.596662e+00
## [140,] -1.3096288026 0.4348639954 -4.954727e-01
## [141,] 1.5368206169 0.4555672163 1.067271e+00
## [142,] -1.0215942496 0.4125756544 -4.747488e-01
## [143,] 1.0444247255 0.9913166113 8.220481e-01
## [144,] 1.2365879201 0.4335448240 4.019708e-01
## [145,] 1.8043878030 -1.4581596522 -2.234234e+00
## [146,] 1.2068872652 0.8686493693 1.166031e+00
## [147,] -1.1245646930 -1.4988462950 1.651410e+00
## [148,] -1.2616645955 -0.5068780410 6.098096e-01
## [149,] -0.0920938487 0.0262620228 -2.524206e-01
## [150,] -0.7297038807 0.2991364693 -3.263687e-01
## [151,] -1.0167003175 0.3134710527 -3.543966e-01
## [152,] -1.1147045006 1.3095613492 -1.357453e+00
## [153,] 1.3489757586 1.0487777969 2.361335e+00
## [154,] 1.1477689008 0.5084884930 3.952296e-01
## [155,] -0.9942496332 -1.4979908601 1.453521e+00
## [156,] -0.7988168859 0.7231260592 -6.514906e-01
## [157,] -0.4785750125 0.7790235378 -5.972386e-01
## [158,] -0.3002309199 -1.4998024033 4.402834e-01
## [159,] -0.6736209445 0.1055309111 -2.375655e-01
```

```
## [160,] -0.8343994890 -1.2811706478 1.013247e+00
## [161,] -0.7800522639 -0.1822632039 5.344004e-02
## [162,] -0.5543194538 0.7363970957 -6.522632e-01
## [163,] -1.2666390012 0.3999523584 -4.612173e-01
## [164,] 0.8242338007 0.1772802673 4.269729e-02
## [165,] -0.7798117038 -1.4724254405 1.135444e+00
## [166,] 1.7396510958 -1.5699157922 -2.404916e+00
## [167,] -1.1861096752 0.4320234945 -5.054443e-01
## [168,] 1.5419088685 0.5130348617 7.891454e-01
## [169,] 1.1527341355 -0.7591144915 -8.566916e-01
## [170,] -0.5619495300 -1.4850308673 8.232605e-01
## [171,] 0.3796217951 0.6090759550 -1.208221e-01
## [172,] -1.3367230622 1.7093789789 -1.908846e+00
## [173,] -0.8019853867 0.7598397378 -6.604456e-01
## [174,] 0.7420794114 0.8572405110 4.938004e-01
## [175,] 0.1315463002 -1.5012966898 -1.399187e-01
## [176,] 0.2069859823 -1.3554944000 -3.361012e-01
## [177,] -0.7421054652 0.4792542643 -4.529189e-01
## [178,] -1.0733900527 0.6202495952 -7.115844e-01
## [179,] -0.8174717340 1.6093159581 -1.311070e+00
## [180,] 1.3892825768 -1.5404105547 -1.881855e+00
## [181,] -1.2313001579 -1.1030615075 1.309525e+00
## [182,] -1.2609876812 -0.5201687552 6.254084e-01
## [183,] -1.0509064868 0.9098253232 -9.535609e-01
## [184,] -0.0002108562 0.3603542683 -2.773425e-01
## [185,] -0.8382252662 0.6639579985 -5.435190e-01
## [186,] -1.2213398487 -1.2986248739 1.539049e+00
## [187,] -0.4732023236 -0.3646972331 -1.805016e-02
## [188,] -1.1458601302 -1.0898648935 1.183640e+00
## [189,] -0.6900369028 -1.5078747402 1.017837e+00
## [190,] 0.3466501553 -0.3156344881 -1.605224e-01
## [191,] 0.4179249166 0.1801278029 -4.993511e-02
## [192,] -1.1462647167 1.1703253702 -1.254608e+00
## [193,] 1.7394477656 -1.5769816124 -2.381820e+00
## [194,] 1.4263569108 1.0872793273 2.383702e+00
## [195,] 1.3056466947 -1.5832727425 -1.728861e+00
## [196,] -0.5937223045 1.2403087577 -8.825812e-01
## [197,] -0.2261192228 -1.3663551448 3.100476e-01
## [198,] 0.9141356820 1.3195485590 1.268987e+00
## [199,] 1.4251034507 1.1943229089 2.147714e+00
## [200,] -1.2135069843 -1.4524174242 1.719549e+00
## [201,] -0.3261666883 1.3627124103 -6.870912e-01
## [202,] -0.7955560299 0.6953372520 -6.673859e-01
## [203,] 1.4195200547 1.0101750610 1.680594e+00
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## [770,] -0.7900792329 1.1652493246 -9.154145e-01
## [771,] -1.2118630498 -1.4846948730 1.757431e+00
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## [779,] 1.5722785189 0.0386121516 1.062834e-01
## [780,] -1.0903422361 -0.5551062401 5.338924e-01
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## [782,] -1.2743325615 -0.2581518177 3.178903e-01
## [783,] 1.3852227668 -0.9261572714 -1.165325e+00
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## [789,] 1.1753156055 -0.3092873595 -4.273252e-01
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## [805,] -0.5694568242 -0.2410468556 4.828000e-02
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## [808,] -1.3078881660 0.4006878731 -4.553616e-01
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## [812,] 0.1897328270 -1.1563379333 -3.829605e-01
## [813,] -1.0383335360 -1.4834534730 1.499212e+00
## [814,] -0.3576474453 0.7689887577 -5.210163e-01
## [815,] -1.2996517275 1.0234580222 -1.159966e+00
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## [817,] -0.5941902160 1.7522303743 -1.079898e+00
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## [960,] -1.0017112025  0.0235117446 -1.989512e-02
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## [962,] -1.2617612975 -0.5049793675  6.075812e-01
## [963,] -1.0877403491  1.4923836413 -1.448996e+00
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## [1013,] -0.8170322665 -0.2650296992  1.568702e-01
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## [1040,] -0.7742240966  0.3276324895 -3.042787e-01
## [1041,] -0.0306567069  0.1808693675 -1.026683e-01
## [1042,] -0.9848717570 -0.2179685220  1.441723e-01
## [1043,]  0.3237771677  1.1063527608  9.770090e-02
## [1044,]  0.7831209796  0.1892298896  1.679498e-02
## [1045,] -1.1863020634 -0.3417858216  3.671913e-01
## [1046,]  0.0036934117 -1.5234896248  4.685935e-02
## [1047,] -1.2113795396 -1.4941882403  1.768573e+00
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## [1050,]  0.2670989742  0.5102481995 -1.444582e-01
## [1051,] -1.0799123894 -0.7558675179  7.641342e-01
## [1052,]  0.2158235560  1.0765545012 -2.194656e-01
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## [1056,] -1.3062734930  1.1502729210 -1.304521e+00
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## [1060,] 0.1164965987 -0.5014643162 -1.032438e-01
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## [1063,] -0.4597201738 0.9653395072 -4.844056e-01
## [1064,] 0.7834150884 -1.5568842027 -9.866706e-01
## [1065,] -0.4156427197 0.9312801171 -4.808803e-01
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## [1067,] -0.4786744918 -0.2845348178 -7.561334e-02
## [1068,] -1.2671149559 0.4007982105 -4.508319e-01
## [1069,] -1.2257447748 -0.3815450860 4.273029e-01
## [1070,] -0.4056124016 -0.2060122475 -4.026818e-02
## [1071,] -1.1228237879 1.4192163310 -1.419533e+00
## [1072,] -1.2141838985 -1.4391267100 1.703950e+00
## [1073,] 0.9802568659 0.8659697596 6.705590e-01
## [1074,] 1.2391453732 -1.4207561791 -1.465709e+00
## [1075,] 0.1936312946 1.6473601440 6.302745e-03
## [1076,] 1.0536846797 0.3134827415 1.285717e-01
## [1077,] -1.2247953512 0.3878644253 -4.541773e-01
## [1078,] 0.1341282030 -1.5158004432 -1.713450e-01
## [1079,] 0.4427853789 1.0519815662 3.357637e-01
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## [1083,] -0.9438226727 1.0672363283 -9.341444e-01
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## [1090,] 1.4391993745 0.8437591961 1.581425e+00
## [1091,] 0.3495373052 0.0864091906 -1.699705e-01
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## [1093,] -1.0855973637 0.7944053343 -8.282621e-01
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## [1116,] 1.5954652545 -0.3755671038 -5.391308e-01
## [1117,] -0.5278552636 0.2962547993 -2.420661e-01
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## [1120,] -0.2946484152 -0.0529995784 -1.117916e-01
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## [1193,]  1.3130436067  0.4434717554  5.204542e-01
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## [1202,] -1.3182352833  0.6038459333 -6.937995e-01
## [1203,] -1.2256866284  0.4113956704 -4.898697e-01
## [1204,] -0.9743887743  0.3460244574 -4.718115e-01
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## [1208,] -0.8870996947  0.2126555531 -2.780690e-01
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## [1210,] 1.7370767484 -1.5640595541 -2.351963e+00
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## [1230,] 1.7616243298 -1.4226197187 -2.276017e+00
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## [1232,] 1.0457448717 0.8757896641 1.077596e+00
## [1233,] -1.2399554728 0.6665134002 -7.557679e-01
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## [1237,] -0.1723486791 -1.5100348202 3.341988e-01
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## [1239,] -0.3687913410 -1.2064732794 4.289065e-01
## [1240,] -1.2609876812 -0.5201687552 6.254084e-01
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## [1257,] -1.2281786375 -0.3341235321 3.721356e-01
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## [1259,] -0.8090527374 -0.3469000652 1.528185e-01
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## [1277,] 1.4089134971 1.2620692831 2.403062e+00
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## [1283,] -1.3166880508 0.5734671580 -6.581453e-01
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## [1310,] 0.4439153913 1.3971364220 5.154286e-01
## [1311,] 0.1953886406 0.8143371358 -1.000726e-01
## [1312,] -0.7790910384 -1.4574221093 1.078807e+00
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## [1315,] -1.0137952101 0.2413522258 -2.495668e-01
## [1316,] -1.2109927315 -1.5017829342 1.777487e+00
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## [1325,] -0.3532719354 -0.2908153303 -1.264482e-01
## [1326,] 1.8678050603 -1.6010651162 -2.465592e+00
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## [1328,] -1.2220167630 -1.2853341597 1.523450e+00
## [1329,] 1.7177247112 -1.4552474421 -2.116673e+00
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## [1331,] -1.2221134650 -1.2834354862 1.521222e+00
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## [1333,] -0.7425391071 0.5170586580 -5.364999e-01
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## [1340,] -0.0414690870 -1.4967766085 9.031137e-02
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## [1342,] -0.8151536010 0.9529991926 -7.996107e-01
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## [1368,] -0.4706018075 1.1626794828 -6.941765e-01
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## [1460,] -0.9649993202  0.1792160861 -2.995259e-01
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## [1508,] -0.8082844537  0.8658792377 -7.612871e-01
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## [1510,] 1.4811959812 -1.5742572466 -2.059701e+00
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## [1580,] 1.4113379546 -0.5380354282 -6.738146e-01
## [1581,] 0.3492672244 0.4818553875 -7.985547e-02
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## [1850,] -1.2571196000 -0.5961156936 7.145440e-01
## [1851,] 0.7398310391 -1.5366249566 -9.684937e-01
## [1852,] 0.2624263313 -0.2821124232 -1.839811e-01
## [1853,] 1.3872818176 -0.3707670568 -4.617425e-01
## [1854,] -0.5749438527 0.4021386791 -3.468947e-01
## [1855,] 0.7428349930 0.5693310787 1.207500e-01
## [1856,] 1.8283120690 -1.5867859010 -2.539924e+00
## [1857,] -1.2622448076 -0.4954860002 5.964393e-01
## [1858,] 0.8810892785 -0.5573535199 -6.825932e-01
## [1859,] -1.0068180833 -1.2988321901 1.283519e+00
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## [1860,] -0.2481795225 -0.0847544797 -1.769150e-01
## [1861,]  0.5236041474  1.0393466379  3.962476e-01
## [1862,]  1.1401141886  1.0369128961  1.421887e+00
## [1863,] -1.2535983463  0.9233688513 -1.042486e+00
## [1864,] -1.2585701305 -0.5676355917  6.811182e-01
## [1865,]  1.8491929718 -1.4490235515 -2.358361e+00
## [1866,] -1.2614711914 -0.5106753879  6.142664e-01
## [1867,]  0.67444400306  0.8674537676  9.298068e-02
## [1868,]  0.5249439936 -1.5417659177 -6.899256e-01
## [1869,]  1.62744464679 -0.0470102102 -5.215861e-02
## [1870,]  0.3740191313  0.6888761092 -1.740451e-01
## [1871,]  1.4197760196  1.2597172639  2.123450e+00
## [1872,]  0.4939836143  0.9141637892  4.128006e-01
## [1873,]  1.5384553518  0.4817765319  9.584540e-01
## [1874,] -1.1269764271 -1.4556975557  1.606396e+00
## [1875,] -1.3088551863  0.4196746077 -4.776455e-01
## [1876,] -1.2987327422  1.0173406745 -1.168752e+00
## [1877,] -0.1998148856 -0.6461384978 -3.776457e-02
## [1878,] -0.1242564687 -0.1276489882 -9.687266e-02
## [1879,] -0.0094794894  1.2071995869 -8.260151e-03
## [1880,] -0.1891461633 -0.2701695405 -1.862414e-01
## [1881,] -0.3592225734  0.2665654342 -2.938621e-01
## [1882,]  1.4689232956 -0.3226058061 -5.756269e-01
## [1883,] -0.6964691452  0.4061799043 -3.923477e-01
## [1884,] -0.3605413888 -0.2438148442 -5.345418e-02
## [1885,] -0.6746367842 -1.0905986390  6.412164e-01
## [1886,] -1.2139904944 -1.4429240569  1.708407e+00
## [1887,] -1.2606008731 -0.5277634490  6.343219e-01
## [1888,] -1.1456619254 -0.3203736746  3.217004e-01
## [1889,] -0.6852378169  0.2834928549 -3.793256e-01
## [1890,]  0.6510015387 -0.7495020048 -6.111697e-01
## [1891,]  1.3850531503  0.4540587422  7.541460e-01
## [1892,]  0.2215992681  0.1593332625 -2.199250e-01
## [1893,] -0.0489870169 -0.4652001108 -1.507397e-01
## [1894,] -1.1614382697  0.7276727565 -8.201871e-01
## [1895,] -0.7039473691  1.0568405315 -7.539642e-01
## [1896,] -1.0815462512 -1.4881688560  1.570375e+00
## [1897,] -0.7358422848 -1.4916148843  1.104450e+00
## [1898,]  1.5313321683  0.5508542928  9.721367e-01
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## [1900,]  0.8703947566  0.8308734313  4.168682e-01
## [1901,]  0.5087504826 -1.3635061798 -7.121369e-01
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## [1908,]  0.6535810251 -1.5152290468 -9.082285e-01
## [1909,]  1.2243273275  0.7631980244  9.725537e-01
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## [1910,] -1.2143634341  0.2022787517 -2.621170e-01
## [1911,] -0.3050572845 -0.4152444390 -4.625321e-03
## [1912,]  0.4096067243  0.5944074308  2.044075e-01
## [1913,]  1.5378198180  0.5038506092  9.197004e-01
## [1914,] -0.3155638695 -0.2775427377 -7.441993e-02
## [1915,] -1.2718183087 -0.3075173276  3.758285e-01
## [1916,] -0.3029051779 -1.4942235214  4.965599e-01
## [1917,]  1.4725169343  0.4295309415  6.698453e-01
## [1918,] -0.2838669148 -0.0772477417 -3.342624e-01
## [1919,]  0.3511002061 -1.5330441431 -4.484773e-01
## [1920,] -0.4865418330  0.8089182474 -4.629380e-01
## [1921,]  1.0832552662  0.0878405527 -8.179003e-02
## [1922,]  0.5610759905  1.0562977105  4.452433e-01
## [1923,]  0.4483089322  1.3139796922  6.088664e-01
## [1924,]  0.0890497777 -1.5408649718 -1.757963e-05
## [1925,] -1.3301296331  0.8373827689 -9.678917e-01
## [1926,] -1.1269047935 -1.4663343097  1.631236e+00
## [1927,]  0.6769753049  1.4111632647  8.133921e-01
## [1928,] -1.2124432619 -1.4733028323  1.744061e+00
## [1929,] -0.3876365369 -1.5184555753  6.315424e-01
## [1930,] -1.2447640989  0.7463507138 -8.299555e-01
## [1931,]  0.9589052441 -1.5480328564 -1.315544e+00
## [1932,]  0.7943408963 -0.2429998981 -2.687217e-01
## [1933,] -0.6906835638 -1.5140041430  1.050234e+00
## [1934,] -1.2137970904 -1.4467214038  1.712864e+00
## [1935,] -1.2140871965 -1.4410253834  1.706178e+00
## [1936,]  1.2456771521  0.0257398790  1.110945e-01
## [1937,] -1.1961331095 -0.1783704509  2.150374e-01
## [1938,]  0.7427053558 -1.5676539354 -9.660883e-01
## [1939,] -1.2696908640 -0.3492881438  4.248531e-01
## [1940,] -0.9209571537 -1.2866342571  1.149080e+00
## [1941,]  1.8213286122 -1.5606626997 -2.421996e+00
## [1942,]  0.8348899583  0.6785200051  6.563519e-01
## [1943,]  1.4458537000  0.5418852108  1.088410e+00
## [1944,] -1.2885484441  0.8180648661 -9.357885e-01
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## [1950,] -1.3192990056  0.6247313414 -7.183119e-01
## [1951,]  0.5799479320  0.9179802425  2.967017e-01
## [1952,]  1.4776592598  0.8656202377  1.592114e+00
## [1953,]  0.6152477444 -0.4521726430 -4.183884e-01
## [1954,] -0.4007305028  0.7819702885 -4.977236e-01
## [1955,] -1.0680479610 -0.9504792145  9.412178e-01
## [1956,] -0.0441880692  0.8385645755 -3.228518e-01
## [1957,]  0.4266166393 -0.1832710751 -4.419281e-01
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## [1959,] -1.0203242886  0.3965970179 -4.679851e-01
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## [1960,]	1.4552157763	-0.4816298681	-8.923250e-01
## [1961,]	-0.2997085626	-0.4675769559	-1.373683e-02
## [1962,]	-0.3129472723	-0.2767803217	-1.451126e-01
## [1963,]	1.4656827032	0.2137381329	3.151081e-01
## [1964,]	0.7235807002	1.0421036506	5.155909e-01
## [1965,]	1.2015498932	-0.5073501733	-6.192825e-01
## [1966,]	-1.0851726841	0.7890828957	-8.260527e-01
## [1967,]	-0.3877018161	-1.5338066496	6.718261e-01
## [1968,]	-0.4390041132	0.8299742684	-6.888370e-01
## [1969,]	1.5789743988	0.2583551360	4.547328e-01
## [1970,]	-0.9068439474	0.5305897249	-5.578654e-01
## [1971,]	-0.3421969724	-1.5183939775	5.135396e-01
## [1972,]	-1.3543051407	1.3120511340	-1.524990e+00
## [1973,]	-0.1348086576	0.9215097478	-3.023417e-01
## [1974,]	1.0115360345	0.0303827925	-2.053552e-01
## [1975,]	0.6978673573	-1.5357058484	-9.443183e-01
## [1976,]	-0.9974742284	1.2805942344	-1.136482e+00
## [1977,]	0.9133066971	1.0380759159	9.214156e-01
## [1978,]	-0.6473569338	-1.4981369160	9.480600e-01
## [1979,]	-0.2668697116	0.6149647904	-3.670796e-01
## [1980,]	-0.8220803147	1.0919702766	-9.666913e-01
## [1981,]	-0.7549500399	-1.1524096676	7.544821e-01
## [1982,]	1.3953754665	0.6556962750	1.052762e+00
## [1983,]	-0.3731821242	0.9230719730	-4.998043e-01
## [1984,]	0.8841397997	1.2496689063	1.156463e+00
## [1985,]	0.1742455182	-0.6297656099	-2.223005e-01
## [1986,]	-0.7257331416	0.8493854333	-7.366480e-01
## [1987,]	0.4759515495	0.3946153472	3.902009e-02
## [1988,]	-0.6783944998	0.8070422580	-7.980309e-01
## [1989,]	-1.2617612975	-0.5049793675	6.075812e-01
## [1990,]	-0.2992956541	-1.5210444122	4.690681e-01
## [1991,]	-1.3086617823	0.4158772608	-4.731888e-01
## [1992,]	1.4273349155	-0.1151556579	-3.672312e-03
## [1993,]	1.2705295538	1.0878905967	1.095435e+00
## [1994,]	-1.2175644437	-0.5517100329	6.398033e-01
## [1995,]	-0.4123997072	0.4422321532	-4.139750e-01
## [1996,]	-0.9886270967	0.5708872047	-6.624997e-01
## [1997,]	-1.0394934228	-1.4823391224	1.526900e+00
## [1998,]	0.9838567346	-0.7452743097	-7.586441e-01
## [1999,]	0.8992233081	0.8238303655	7.533351e-01
## [2000,]	-0.4149374654	0.9592434005	-5.696725e-01
## [2001,]	0.5570172876	1.0732031722	5.094531e-01
## [2002,]	-1.0949015044	-0.4659082098	4.296327e-01
## [2003,]	-1.2883900347	0.7946662715	-8.811659e-01
## [2004,]	-1.2195718808	1.0412786509	-1.156576e+00
## [2005,]	1.4933536756	0.1969802125	7.064095e-01
## [2006,]	-1.1548217203	0.6138461115	-7.081264e-01
## [2007,]	0.7750662921	0.5522300815	3.930452e-01
## [2008,]	0.4884573886	1.0526884416	2.100298e-01
## [2009,]	0.0908508406	-1.5120268002	-1.198111e-01

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## [2010,] -0.7904439073 0.0402753511 -2.325188e-01
## [2011,] -0.1316796516 -0.4729369694 -1.107873e-01
## [2012,] -0.9730368142 0.9670199855 -9.909989e-01
## [2013,] 0.3934650320 -1.5111784352 -5.404411e-01
## [2014,] -1.2609876812 -0.5201687552 6.254084e-01
## [2015,] 1.2602942517 0.9922961784 1.604640e+00
## [2016,] 0.7809679289 0.2439323562 -6.404589e-02
## [2017,] 1.0403506124 1.1659917896 1.566814e+00
## [2018,] -0.7281631952 0.9076531733 -8.191652e-01
## [2019,] -1.1650441902 0.8065145864 -9.234868e-01
## [2020,] -0.9165301804 1.2813098210 -1.112833e+00
## [2021,] 1.3986123927 1.3201578807 2.527885e+00
## [2022,] 1.4200650664 1.0203565256 1.640689e+00
## [2023,] -0.2133170320 -1.5020183928 3.143809e-01
## [2024,] -0.6050612279 -1.5176384124 9.618435e-01
## [2025,] 1.3260092014 0.5896005918 8.890515e-01
## [2026,] -1.2500485017 0.0667618691 -6.019475e-02
## [2027,] -1.0490782884 -1.2965691208 1.312112e+00
## [2028,] -0.7780301255 0.9733174270 -7.499179e-01
## [2029,] -1.2124432619 -1.4733028323 1.744061e+00
## [2030,] 0.3784643448 -0.1886962027 -2.391459e-01
## [2031,] 0.4507685931 -0.0732692312 -2.765990e-01
## [2032,] -1.3170748589 0.5810618518 -6.670588e-01
## [2033,] -1.3099189087 0.4405600157 -5.021579e-01
## [2034,] -0.3363387971 0.9751193387 -5.224636e-01
## [2035,] -0.4657519256 0.6065772183 -5.010413e-01
## [2036,] 1.4887599972 0.5522513316 1.011106e+00
## [2037,] -0.9516804019 -1.5123987940 1.447318e+00
## [2038,] -0.1778772651 0.0294491261 -1.586723e-01
## [2039,] -0.6846316039 0.3090140732 -4.593790e-01
## [2040,] -0.9502764051 -1.5063341177 1.395177e+00
## [2041,] 1.3196907562 1.1910824424 1.697036e+00
## [2042,] -1.2211464447 -1.3024222208 1.543506e+00
## [2043,] -1.2399000882 0.6861712512 -8.066118e-01
## [2044,] -0.5552315970 1.2362498950 -8.075814e-01
## [2045,] 1.4318905002 0.4146582040 6.985465e-01
## [2046,] 1.6934835630 -0.7409855883 -1.120937e+00
## [2047,] 1.7413011788 -1.5870063163 -2.405351e+00
## [2048,] 0.5061965348 1.2012332448 4.470846e-01
## [2049,] 0.5367271251 0.5192135666 2.815562e-01
## [2050,] -1.2270374649 -0.3699637914 4.321845e-01
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## [2054,] 1.5476618171 0.4249834154 8.591486e-01
## [2055,] 0.1029450180 0.9485666698 -1.604902e-01
## [2056,] 1.4923500634 0.5535490160 9.134804e-01
## [2057,] -1.0141906766 -0.4181633606 3.412565e-01
## [2058,] 1.5840247486 -1.4091543279 -1.947766e+00
## [2059,] 0.7307516672 0.2696186495 1.148237e-01
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## [2060,] 0.0468967698 -1.5361371961 1.956547e-02
## [2061,] 0.0058532192 0.7148720442 -2.508926e-01
## [2062,] 1.5031482877 -1.4053480453 -1.984552e+00
## [2063,] 1.1838018632 0.9822673610 1.487378e+00
## [2064,] 0.4791451958 1.1135222992 3.019624e-01
## [2065,] -1.3582699239 1.3898967459 -1.616354e+00
## [2066,] 0.7159385719 -0.2496622881 -3.442395e-01
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## [2071,] 0.8387571687 1.0291063146 7.504238e-01
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## [2075,] 1.3683052240 1.0114180617 1.947122e+00
## [2076,] 1.5624052554 0.3553885763 6.464668e-01
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## [2082,] -0.6762066118 0.6960913203 -5.767878e-01
## [2083,] -1.1100743140 -0.9714053075 1.021924e+00
## [2084,] 0.1891686237 -0.3004986101 -3.652703e-01
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## [2109,] 0.4138589727 0.9265585207 3.346750e-01
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## [2110,] 0.3256868705 -0.1441144745 -4.042755e-02
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## [2118,] -0.8655099512 0.5625965406 -6.482123e-01
## [2119,] -0.0984362736 0.5782209258 -3.959146e-01
## [2120,] -1.0478653878 -1.2975363028 1.282661e+00
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## [2122,] -1.2593437467 -0.5524462040 6.632910e-01
## [2123,] 0.4006518962 -0.7833532663 -4.048664e-01
## [2124,] 0.3305958951 0.2960488479 -1.987919e-01
## [2125,] -1.3190088995 0.6190353210 -7.116267e-01
## [2126,] 0.6603841762 0.8717765757 4.515779e-01
## [2127,] 0.4652113684 -0.5962398563 -4.188523e-01
## [2128,] -0.2557671953 -1.5197867563 3.982936e-01
## [2129,] -1.3098222066 0.4386613423 -4.999295e-01
## [2130,] -1.2123465599 -1.4752015057 1.746289e+00
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## [2132,] -0.7850346841 1.0773984528 -8.272950e-01
## [2133,] -0.7479146905 -1.2975805414 9.342835e-01
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## [2157,] -1.2792298172 0.6293886523 -7.067007e-01
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## [2159,] -0.2444807932 1.1986189758 -2.688773e-01
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## [2160,] 1.4004830022 0.8861998062 1.415927e+00
## [2161,] -0.6922383832 -1.4901477962 1.031166e+00
## [2162,] 0.9891309124 0.7779141218 6.585347e-01
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## [2165,] 1.1667773918 0.3402103796 3.183716e-01
## [2166,] -0.4545529026 -0.0684282726 -1.760622e-01
## [2167,] -1.2489130828 0.0655795946 -8.706888e-02
## [2168,] -1.2583767264 -0.5714329386 6.855749e-01
## [2169,] -1.2162239487 1.0050630814 -1.153588e+00
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## [2173,] 1.4633159388 0.8843148830 1.922160e+00
## [2174,] 1.0426190825 -1.5569651945 -1.340459e+00
## [2175,] -1.0376091559 -1.5031137869 1.529566e+00
## [2176,] 1.4670259415 0.7064617967 1.194948e+00
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## [2180,] -1.3041233192 1.1128994467 -1.267142e+00
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## [2182,] 0.7431510889 -1.5339097267 -1.062583e+00
## [2183,] 1.3519881103 1.2864677437 2.761516e+00
## [2184,] -0.0323258318 -1.1293766562 3.460095e-03
## [2185,] 1.7165701036 -1.4367814579 -2.132718e+00
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## [2187,] -1.3499535493 1.2266108283 -1.424712e+00
## [2188,] 0.8992955266 0.5296896445 4.139023e-01
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## [2193,] 1.4055027353 -0.2273862030 -2.243772e-01
## [2194,] -0.6269605124 0.0136283058 -1.566092e-01
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## [2210,] -0.8101884470  0.9256073429 -8.613007e-01
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## [2230,] -0.3714464468 -0.1050521982 -1.154404e-01
## [2231,]  0.3157491632  0.4195349979 -1.187909e-01
## [2232,] -1.1469615111  0.4427924928 -4.849790e-01
## [2233,] -0.1615405171 -0.6096226025 -5.901772e-02
## [2234,] -1.3587534341  1.3993901132 -1.627496e+00
## [2235,]  1.5731048810 -1.1039518089 -1.350994e+00
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## [2239,]  1.2366086898  0.9052602810  1.369353e+00
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## [2260,] 1.3450446092 1.3325933992 1.751610e+00
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## [2310,] 1.5162383235 0.6238106334 1.185584e+00
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## [2312,] -1.0829140523 -1.4572919716 1.528753e+00
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## [2315,] -0.9444051612 1.1046275180 -1.012775e+00
## [2316,] 1.1701372732 0.5918678174 6.743262e-01
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## [2320,] -0.7629793200 0.7940526133 -6.951454e-01
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## [2329,] 1.0285734513 -0.1195287596 -2.765475e-01
## [2330,] -0.7279730942 0.8561699655 -6.948162e-01
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## [2338,] -0.2236992174 1.4769685411 -4.379125e-01
## [2339,] -1.1775417573 -0.4973380001 5.277341e-01
## [2340,] -0.7020374559 -0.7939190060 6.160684e-01
## [2341,] -1.0821911421 -1.4834577331 1.575489e+00
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## [2366,] 1.3014938013 1.2294189517 2.079027e+00
## [2367,] -1.2230804853 -1.2644487516 1.498938e+00
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## [2391,] -0.1344151320 0.9226021914 -3.154301e-01
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## [2394,] -1.1890361435 -1.0944783906 1.253582e+00
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## [2588,] -0.7339277333 -1.5166397220 1.116998e+00
## [2589,] 1.4321658130 -1.5539467978 -1.898501e+00
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## [2655,] 1.1045250631 0.5253579360 4.129805e-01
## [2656,] -0.7688393180 -0.3201711400 1.051861e-01
## [2657,] 1.4809888569 -0.7308168259 -9.437158e-01
## [2658,] -1.2260928421 -0.3738428459 4.171008e-01
## [2659,] 0.9167512209 1.2314560215 1.421561e+00
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## [2660,] 1.1074998751 0.7802806497 7.708530e-01
## [2661,] -0.0603617908 1.0082107603 -3.239427e-01
## [2662,] 1.3378867636 0.2632183276 3.203187e-01
## [2663,] 1.4049849580 1.2598319839 2.511944e+00
## [2664,] -1.2115729437 -1.4903908934 1.764117e+00
## [2665,] -0.6306984349 1.1987283360 -8.827282e-01
## [2666,] 0.6530968464 0.8667165004 6.558381e-01
## [2667,] 1.0943531268 1.0749670102 1.452579e+00
## [2668,] -0.0849037836 -1.5129438329 1.960799e-01
## [2669,] -0.5313312457 1.3780601148 -7.155539e-01
## [2670,] -1.0824337823 -1.4841313123 1.583560e+00
## [2671,] 0.5662579001 -1.5054806271 -7.904936e-01
## [2672,] 0.0008109076 -1.5076532309 8.283876e-02
## [2673,] -1.1842516464 0.4003403803 -4.746823e-01
## [2674,] 0.0459378740 -1.5322977639 3.512388e-02
## [2675,] -1.1943675511 0.5716334614 -6.391405e-01
## [2676,] 1.5136713731 0.4003598732 7.379207e-01
## [2677,] 0.6644574084 -0.8660136343 -6.721346e-01
## [2678,] -1.1445900471 -0.3412364414 3.459414e-01
## [2679,] -1.0835713311 0.7306817707 -7.214180e-01
## [2680,] 1.3325551605 0.9970795986 1.846306e+00
## [2681,] 1.4759211054 0.8326224581 1.720705e+00
## [2682,] -0.5887839395 0.6519452910 -6.107192e-01
## [2683,] -0.2590769018 0.9547775040 -3.491246e-01
## [2684,] -1.1624338989 0.7162403590 -7.652944e-01
## [2685,] 1.4069841980 1.3390641169 2.260332e+00
## [2686,] -1.0400090158 0.7645402487 -8.749883e-01
## [2687,] -1.0350632044 -0.0253449236 -9.702147e-02
## [2688,] -0.3820227509 -0.4417563967 -6.804111e-02
## [2689,] 1.8713240620 -1.5956304651 -2.571743e+00
## [2690,] -0.9080281336 -1.5042960707 1.356092e+00
## [2691,] 0.7496670121 0.4170943847 3.236480e-01
## [2692,] 1.6041814926 -1.0007322939 -1.350640e+00
## [2693,] 1.4952586168 0.4576014095 1.078087e+00
## [2694,] -1.1688507564 -1.4892043588 1.714714e+00
## [2695,] -0.0269476554 1.1005823606 -3.577759e-01
## [2696,] 0.2509204381 -1.3791151476 -3.550431e-01
## [2697,] 1.3964401859 -1.5833872808 -1.962018e+00
## [2698,] -1.2584734285 -0.5695342652 6.833466e-01
## [2699,] -1.2702710762 -0.3378961030 4.114828e-01
## [2700,] 0.8763798521 -0.2544146581 -2.433758e-01
## [2701,] 1.8400456057 -1.4072362292 -2.222908e+00
## [2702,] -1.2800007939 0.6532538568 -7.463942e-01
## [2703,] -1.2837947800 1.4875118685 -1.666119e+00
## [2704,] -0.8870362391 1.4624864260 -1.266736e+00
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## [2706,] -0.2148485846 -1.4954344351 3.380962e-01
## [2707,] -0.2562637549 0.9235787152 -3.446847e-01
## [2708,] -0.9282971824 -1.1401420635 9.739676e-01
## [2709,] -1.2129267721 -1.4638094650 1.732919e+00
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## [2710,] 0.7831800301 0.8604268705 4.819960e-01
## [2711,] 0.5065985071 -1.3521431751 -6.841206e-01
## [2712,] -0.4968375259 -0.6076261380 1.370022e-01
## [2713,] 1.5155779271 0.5959718772 1.272884e+00
## [2714,] 1.3339464177 -0.8123946872 -1.179873e+00
## [2715,] 0.9541837548 0.1164427282 9.402560e-03
## [2716,] -0.6832452907 -0.3498894632 8.307258e-02
## [2717,] -0.9578842480 0.6970185258 -7.109357e-01
## [2718,] 0.1362311798 -1.5576391832 -1.215066e-01
## [2719,] -0.3444086164 -1.4855253914 4.890940e-01
## [2720,] 1.4349225001 -1.5614639756 -1.952075e+00
## [2721,] -1.1774423636 -1.3115126420 1.494113e+00
## [2722,] -0.0866354263 -1.4960797220 1.992269e-01
## [2723,] -1.1949829359 1.3236962649 -1.435908e+00
## [2724,] -0.2907199076 -0.0659322229 -1.825606e-01
## [2725,] -1.2983421563 1.0054222230 -1.149075e+00
## [2726,] 0.5360505883 1.2837219091 5.316578e-01
## [2727,] 1.0862291609 1.1759405148 1.412432e+00
## [2728,] -1.0832208021 -1.4711462559 1.571623e+00
## [2729,] -1.2803280873 -0.1404340631 1.797300e-01
## [2730,] -0.7780928641 -1.4828237262 1.116389e+00
## [2731,] 0.7870622588 0.1546614760 4.777507e-05
## [2732,] 1.0497698915 0.6251289192 5.250259e-01
## [2733,] 1.1327817007 1.0273932153 1.638538e+00
## [2734,] 0.4083739873 0.2966440987 -9.162317e-02
## [2735,] 1.0274075896 0.9484105764 1.377140e+00
## [2736,] -1.2592470447 -0.5543448775 6.655194e-01
## [2737,] -1.1854616109 1.1182457710 -1.170005e+00
## [2738,] 1.3887650819 -0.0614726386 -2.012674e-01
## [2739,] 1.2357095723 1.2252780866 1.665507e+00
## [2740,] 0.2831912447 1.1024280954 9.783144e-02
## [2741,] -1.3397998361 1.0272501150 -1.190731e+00
## [2742,] 0.0847243300 -1.4900260475 -1.405033e-02
## [2743,] -0.9517203124 -1.5146767095 1.454090e+00
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## [2745,] 0.0271066585 0.4206315385 -7.029278e-02
## [2746,] -1.1246028648 -1.5054536285 1.669013e+00
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## [2759,] 1.2490088823 0.3271629817 3.427585e-01
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## [2766,] -0.7030168617  1.1287715734 -9.591412e-01
## [2767,] -0.7957198260  0.0841414834 -2.040501e-01
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## [2769,] -0.2396879806 -1.1873103495  2.168723e-01
## [2770,] -1.0588404557 -0.3618544230  2.968753e-01
## [2771,]  0.8801676691 -0.2677378655 -3.094655e-01
## [2772,] -0.6989385086  0.4708398853 -4.898914e-01
## [2773,] -0.8209082759 -1.4907704232  1.185226e+00
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## [2775,] -1.0122182343  0.9323203217 -9.504670e-01
## [2776,] -0.3290019757  0.4020825764 -3.521515e-01
## [2777,] -1.0030135947 -0.5735078354  4.377526e-01
## [2778,]  0.1662717072  0.6753824448 -6.215653e-02
## [2779,]  0.3378081764  0.9199227038  1.972806e-01
## [2780,] -1.2426345245  1.4540227029 -1.587347e+00
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## [2782,] -0.1942322184 -0.2517818068 -9.875162e-02
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## [2785,] -0.4094695496  0.9354143612 -6.535288e-01
## [2786,]  0.5589604320  1.3556016464  8.254132e-01
## [2787,]  0.9855791927  0.1577007707  1.570478e-01
## [2788,] -0.6769631047 -0.4494744585  1.681415e-01
## [2789,] -1.2061029223  0.7752719153 -8.422951e-01
## [2790,] -0.1479068616 -0.2514283348 -2.407708e-01
## [2791,] -0.9862371910  0.5363463583 -6.385383e-01
## [2792,]  0.8417167444  0.6714659803  4.946325e-01
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## [2795,]  1.1369810488 -1.5731789647 -1.626967e+00
## [2796,] -0.3899559787 -1.4967218522  6.379054e-01
## [2797,]  1.0493077201  1.0998379563  1.497581e+00
## [2798,] -0.1381335302  1.4059962203 -3.556351e-01
## [2799,]  0.6144788569 -1.5388730923 -8.975557e-01
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## [2802,]  0.9841707532  0.5413183471  3.068027e-01
## [2803,] -0.9505140979 -1.5091610853  1.408528e+00
## [2804,] -1.3205105199  1.4379858125 -1.653147e+00
## [2805,]  0.2951835021 -0.9579510212 -4.235644e-01
## [2806,]  1.1834156872  1.0137021551  1.418552e+00
## [2807,]  0.4383167344 -1.5365871127 -5.790008e-01
## [2808,]  1.2223302050  1.0064855628  1.490345e+00
## [2809,]  1.6746498412 -1.4270733263 -2.131765e+00
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## [2810,] 1.3085657730 -0.6661401829 -8.801909e-01
## [2811,] -1.2629108877 1.0968921024 -1.233663e+00
## [2812,] 1.4251809809 1.0775135298 2.439147e+00
## [2813,] 0.5202377918 -1.5136552061 -6.368481e-01
## [2814,] -0.2227148885 1.0921736161 -5.735617e-01
## [2815,] -1.1542506557 -0.1600109502 1.445617e-01
## [2816,] 1.0269384340 -1.4206241757 -1.270835e+00
## [2817,] -1.3172682630 0.5848591987 -6.715156e-01
## [2818,] 0.3081249250 0.4655505866 -3.399690e-02
## [2819,] 0.4356844573 -1.5135547111 -5.676778e-01
## [2820,] 1.4807497105 -1.5863317243 -2.017635e+00
## [2821,] -0.6197573914 -1.2658740608 7.156023e-01
## [2822,] -0.7499444246 -0.6274604345 3.805639e-01
## [2823,] -1.2703677782 -0.3359974295 4.092544e-01
## [2824,] -1.2129267721 -1.4638094650 1.732919e+00
## [2825,] -1.0187348379 0.3576669529 -4.119564e-01
## [2826,] 1.1704215790 -0.2556925890 -4.333366e-01
## [2827,] -0.9160254594 1.3867328197 -1.390963e+00
## [2828,] 0.2977313239 0.1618604143 -7.434394e-02
## [2829,] 1.4206932820 -0.3022412170 -4.355957e-01
## [2830,] 0.5660475521 -1.5255686631 -7.344956e-01
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## [2832,] 0.5611970660 1.0089571298 5.609986e-01
## [2833,] -1.2130234741 -1.4619107915 1.730691e+00
## [2834,] 0.5241292972 -1.5310248149 -6.954971e-01
## [2835,] 0.5270001365 -1.5533949579 -7.147546e-01
## [2836,] -0.4395235819 0.7765212658 -5.408881e-01
## [2837,] -1.1357300156 -1.2914582398 1.423851e+00
## [2838,] -1.1403421440 -0.4226303457 4.387784e-01
## [2839,] 1.0001162371 -1.5553757045 -1.303796e+00
## [2840,] -1.2434904753 1.5166602176 -1.722218e+00
## [2841,] -0.9503930687 1.2440376448 -1.205635e+00
## [2842,] -1.2514436476 0.1148998219 -1.444645e-01
## [2843,] -0.3004564664 0.5762920497 -4.636214e-01
## [2844,] -0.3223375788 -0.2400016569 9.309155e-03
## [2845,] -0.7355553559 -1.4843169906 1.078573e+00
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## [2849,] 1.0907728288 0.2946947063 2.774432e-01
## [2850,] -0.6482040256 0.3187319786 -3.647624e-01
## [2851,] 0.5672458165 -1.5612504331 -6.763456e-01
## [2852,] -1.2703677782 -0.3359974295 4.092544e-01
## [2853,] 0.6168752712 -0.1056366667 -2.552705e-01
## [2854,] -0.8246960930 -1.4774472158 1.251316e+00
## [2855,] 1.4523122033 0.4861321261 1.058722e+00
## [2856,] 1.2735538721 0.9120808320 1.457644e+00
## [2857,] -1.3318702696 0.8715588912 -1.008003e+00
## [2858,] -1.0578069587 0.3557775434 -4.567295e-01
## [2859,] -1.2596338528 -0.5467501836 6.566058e-01
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## [2860,] -1.1706643633 0.1650018313 -2.405622e-01
## [2861,] 1.2046351257 1.1827440069 1.512631e+00
## [2862,] -0.8887190222 0.8774135991 -8.291046e-01
## [2863,] -0.2167599904 -1.4985734552 3.962239e-01
## [2864,] -0.3179979262 0.8071550064 -5.825616e-01
## [2865,] -1.1433670073 1.1827037773 -1.361874e+00
## [2866,] 0.8545769106 1.2503391751 8.553095e-01
## [2867,] -0.8120363753 0.9118089275 -7.780610e-01
## [2868,] 0.5544374772 -1.4407741097 -6.423618e-01
## [2869,] -0.3879450999 1.1226399152 -6.131517e-01
## [2870,] 1.5250707686 -1.5763724128 -2.131105e+00
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## [2872,] -0.4306479608 -1.5161107985 6.796760e-01
## [2873,] 1.0464396623 0.9145595113 9.619291e-01
## [2874,] -0.4851411876 0.8843215345 -6.891962e-01
## [2875,] 1.3926292586 0.9445810125 1.475686e+00
## [2876,] -0.8809776751 0.6973615247 -5.802253e-01
## [2877,] -0.0461538931 0.0103757487 -3.435090e-01
## [2878,] -0.8833472041 0.1602260762 -2.449800e-01
## [2879,] 1.6712055073 -1.3846240050 -2.147880e+00
## [2880,] 1.5209859856 0.5026287569 1.365247e+00
## [2881,] 1.2049920135 1.3588842165 2.137247e+00
## [2882,] 0.9820036034 1.1088147981 1.091055e+00
## [2883,] -1.2605041711 -0.5296621225 6.365503e-01
## [2884,] -1.3106925249 0.4557494034 -5.199850e-01
## [2885,] 1.1328803002 -0.6105200677 -7.081607e-01
## [2886,] 0.5917802430 0.1172600025 -1.556510e-01
## [2887,] -1.3275186782 0.7861185855 -9.077252e-01
## [2888,] -1.2129267721 -1.4638094650 1.732919e+00
## [2889,] -0.4078271283 -0.1146399161 -2.116168e-01
## [2890,] 0.6721378203 -0.2235032497 -3.351891e-01
## [2891,] 0.3513562499 -1.5301662325 -4.624378e-01
## [2892,] -0.6909718997 -1.4974675968 1.016267e+00
## [2893,] 0.5881147057 -1.3173324393 -7.611704e-01
## [2894,] -1.0865806293 0.1397593601 -2.342228e-01
## [2895,] 1.6606289650 -0.5569667873 -7.196814e-01
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## [2899,] -0.7718996225 -0.9264050026 6.321904e-01
## [2900,] -0.3187263345 0.2854109888 -3.291224e-01
## [2901,] -0.5101717247 0.5985109200 -3.897320e-01
## [2902,] -1.0568408985 -0.4104816271 3.664873e-01
## [2903,] -0.5761168611 0.9619467311 -6.459868e-01
## [2904,] -0.6810670374 1.3648546765 -1.052694e+00
## [2905,] 0.4788016529 -0.3638590837 -2.833732e-01
## [2906,] 0.2429547872 -1.3470500687 -2.262261e-01
## [2907,] -1.3155276264 0.5506830764 -6.314046e-01
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## [2909,] 0.8243741440 -0.1340083155 -2.554441e-01
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## [2910,] -0.0076389550  0.0323896192 -3.346508e-01
## [2911,]  1.6537442018 -0.2709023630 -1.808902e-01
## [2912,]  0.8640232058 -0.7452051672 -8.385857e-01
## [2913,]  1.6978010285 -1.5621799184 -2.400854e+00
## [2914,] -0.9611216724 -0.6244699646  5.411908e-01
## [2915,]  0.7564454648 -0.5749721739 -5.916579e-01
## [2916,]  1.5534264937  0.3738056058  8.362026e-01
## [2917,] -1.0343098111  1.3109190160 -1.320977e+00
## [2918,] -0.2606846721  1.0088265697 -4.426565e-01
## [2919,]  0.8094385799  0.7036067336  1.857834e-01
## [2920,] -0.9060479023  0.5154626009 -5.407843e-01
## [2921,]  0.5876720649  1.1492461897  5.891733e-01
## [2922,]  1.2796145508  1.3182126802  2.431038e+00
## [2923,] -1.3085650803  0.4139785873 -4.709604e-01
## [2924,]  1.3361207118  0.6909652917  1.445133e+00
## [2925,]  0.4108425946 -0.8460826000 -5.151283e-01
## [2926,]  0.0733701874 -1.3156689995 -1.536593e-01
## [2927,] -0.0994036599  1.4112697727 -3.103683e-01
## [2928,]  0.7422935053  1.4270131490  1.209743e+00
## [2929,]  1.6754097535 -1.4488021235 -2.097148e+00
## [2930,] -0.7318695199 -1.5130931582  1.053988e+00
## [2931,]  1.5117882759  0.4233049069  7.297710e-01
## [2932,]  0.1889550784  1.2425170650  6.980962e-02
## [2933,]  1.1921931106  0.6808808984  9.474835e-01
## [2934,]  0.7348354212  0.9628239871  4.189420e-01
## [2935,] -0.8877100839  0.8455404966 -7.755470e-01
## [2936,]  0.9060664554 -0.4385594552 -5.610446e-01
## [2937,]  1.4899963229  0.7546712436  1.546581e+00
## [2938,]  0.7413302681 -1.5389644013 -1.002023e+00
## [2939,]  0.4645363216 -1.3753358630 -5.967778e-01
## [2940,] -0.8082258070 -0.3576072061  1.579831e-01
## [2941,] -0.9898012564  0.5719619329 -6.343371e-01
## [2942,]  0.7163745358  0.4182467756  1.193149e-01
## [2943,]  0.5942792732  0.7410524106  3.645139e-01
## [2944,]  0.2323973474  1.1178423588  3.176915e-01
## [2945,]  1.0102546620 -0.2631813092 -5.106575e-01
## [2946,] -1.0812598914 -1.4743711751  1.528183e+00
## [2947,] -0.5068035272  0.0773036397 -2.453205e-01
## [2948,] -0.1265985871 -1.5004426958  1.840894e-01
## [2949,] -0.6251132226  1.5562510126 -8.512408e-01
## [2950,] -1.0705649721  0.5847496901 -6.966520e-01
## [2951,] -1.1117157315  1.2680144833 -1.331631e+00
## [2952,]  0.6442540798  1.0090370309  5.307058e-01
## [2953,] -1.2059942551  0.7842420693 -8.676879e-01
## [2954,] -1.2111861355 -1.4979855872  1.773030e+00
## [2955,] -0.3285730948  1.3061883115 -4.818284e-01
## [2956,] -0.5211380821  1.3803512947 -9.892373e-01
## [2957,] -0.8152763932 -0.2558210769  8.758150e-02
## [2958,] -1.1475221469 -1.0684732532  1.173582e+00
## [2959,]  0.1996972456 -1.3367200353 -1.916854e-01
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## [2960,] -0.3219357082 -0.1478669094 -2.327321e-01
## [2961,]  0.7126786478  0.3754800011  3.239079e-01
## [2962,] -0.7138263156 -0.5384181022  2.840212e-01
## [2963,]  0.9078994919  1.4062585071  1.215057e+00
## [2964,] -1.2670530633  1.1742452656 -1.319127e+00
## [2965,]  1.1499292072  1.1547915008  1.944272e+00
## [2966,] -1.1430706377  0.4015827838 -4.837158e-01
## [2967,]  1.0080506830  0.6679020199  4.376219e-01
## [2968,]  1.6593771962 -0.1924183876 -5.261355e-01
## [2969,]  1.0776136563  0.9226959814  1.198609e+00
## [2970,] -0.2670592449  1.0843167500 -4.647616e-01
## [2971,] -1.2078107570  0.0492665925 -4.992820e-02
## [2972,] -0.4411274068 -1.3544954126  5.490876e-01
## [2973,] -1.2110894335 -1.4998842607  1.775259e+00
## [2974,] -0.4051925945  0.8172600269 -4.690991e-01
## [2975,]  1.0773151107 -0.4913265045 -6.236211e-01
## [2976,]  1.8412622840 -1.4125271688 -2.241596e+00
## [2977,]  1.6473417949 -1.5566722264 -2.164901e+00
## [2978,]  0.9981781186 -1.5174135560 -1.348228e+00
## [2979,]  1.4878231670  0.5214780616  1.113044e+00
## [2980,] -0.1452370881 -1.3029648841  1.778613e-01
## [2981,] -0.0441552108  1.6613874096 -2.379051e-01
## [2982,]  0.9265530101  0.0076192270 -6.744702e-02
## [2983,]  0.1759642976 -1.5192408610 -1.858323e-01
## [2984,]  1.4366077983  1.1135690967  2.048207e+00
## [2985,] -1.2105092213 -1.5112763015  1.788629e+00
## [2986,] -0.8518347636 -0.9741636353  7.002123e-01
## [2987,]  0.1103040612  0.8411354632 -8.401374e-02
## [2988,] -0.7694756860 -0.9846897236  7.149110e-01
## [2989,] -1.2128300701 -1.4657081384  1.735147e+00
## [2990,]  1.3547247547 -0.9757596342 -1.315595e+00
## [2991,] -1.2222101670 -1.2815368128  1.518993e+00
## [2992,] -0.5836870536 -0.0465013545 -6.645231e-02
## [2993,]  1.4121126767  0.5569622728  8.608833e-01
## [2994,] -1.2765914546  0.5912032879 -6.801136e-01
## [2995,] -0.4335120826 -1.4850535180  6.769314e-01
## [2996,] -0.8901559432  0.8669232793 -7.649795e-01
## [2997,] -0.8657291246 -1.4761117062  1.249983e+00
## [2998,] -0.2688133781  0.6464101707 -3.949933e-01
## [2999,] -0.2633432489  0.5662420951 -3.373623e-01
## [3000,] -1.3457953620  1.1449678695 -1.328891e+00
## [3001,] -0.2137274387 -1.4966563319  3.116968e-01
## [3002,] -0.7828194815  0.5096479639 -5.356425e-01
## [3003,] -0.0365670383  0.3660044181 -4.124463e-01
## [3004,] -0.7777806293 -1.4927925612  1.133227e+00
## [3005,] -1.2217266569 -1.2910301801  1.530135e+00
## [3006,]  0.1811221223  0.5020627060 -1.705311e-02
## [3007,] -0.8656750041 -1.5041340558  1.318964e+00
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## [3009,] -0.1547334917  0.2558439477 -2.592674e-01
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## [3010,] 0.3940318347 0.7418776522 2.432909e-01
## [3011,] 1.0151000366 0.5336056339 5.897343e-01
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## [3013,] -0.5825812559 -0.0044234117 -2.012343e-01
## [3014,] 1.6287966929 -1.4087789490 -2.049008e+00
## [3015,] -0.3985541341 -0.2557661170 -1.007936e-01
## [3016,] 0.1314633637 -1.0381501803 -2.248122e-01
## [3017,] -1.0386702702 -1.4887225057 1.521301e+00
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## [3019,] 1.5372180777 0.5281856211 8.743782e-01
## [3020,] -0.8658229183 -1.4763720814 1.253103e+00
## [3021,] 1.6258417173 -1.3649711486 -2.081399e+00
## [3022,] -0.7272577079 0.8538216631 -7.077203e-01
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## [3026,] -1.3272285721 0.7804225651 -9.010400e-01
## [3027,] 0.7179349191 0.1239030171 -2.587242e-01
## [3028,] -0.5178837408 -1.5256240066 8.435077e-01
## [3029,] 1.2709098826 1.1904137205 1.904391e+00
## [3030,] -1.3368020732 0.9683912377 -1.121651e+00
## [3031,] -0.3174681329 0.2173887719 -1.912960e-01
## [3032,] 1.5156309723 -0.6718773817 -9.258319e-01
## [3033,] 0.1297656587 -1.5149083143 -5.891695e-02
## [3034,] 1.2545467565 1.0413545617 1.632460e+00
## [3035,] 1.6542752723 -0.2412554987 -2.693338e-01
## [3036,] 1.4021070370 1.0940302592 1.927618e+00
## [3037,] -1.2698842681 -0.3454907968 4.203963e-01
## [3038,] 0.7024441059 -1.1983196878 -8.357328e-01
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## [3041,] 0.6540189308 -0.0440870760 -3.096974e-01
## [3042,] 1.0178542266 1.0150763023 1.460760e+00
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## [3044,] -1.2166932245 -0.5557928592 6.271609e-01
## [3045,] -1.1247467325 -1.4928502771 1.641130e+00
## [3046,] -1.1755868450 0.9679545020 -1.051973e+00
## [3047,] 1.4924904222 0.5344345567 9.578140e-01
## [3048,] 0.2311593185 -0.3381838087 -2.977852e-01
## [3049,] 1.1857713247 1.0289099927 1.318426e+00
## [3050,] 1.2472481251 1.0644357030 1.766315e+00
## [3051,] 0.6563474764 0.2545511444 -4.466806e-02
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## [3053,] -0.1662017470 -1.5168090259 1.896463e-01
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## [3055,] 1.5027616854 -1.4389281045 -1.890024e+00
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## [3058,] -0.2551556101 -1.0070355341 1.705185e-01
## [3059,] 0.0733825875 1.1742314999 4.960025e-02
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## [3060,] -0.4800334433 0.2249132347 -2.432941e-01
## [3061,] -1.2619547016 -0.5011820206 6.031244e-01
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## [3063,] -1.1348029653 0.9160835227 -9.171265e-01
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## [3065,] -0.8220290901 -1.4700435043 1.162613e+00
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## [3068,] 1.1323392072 0.2970069121 2.555925e-01
## [3069,] 0.8462115877 -0.2966002603 -4.209469e-01
## [3070,] 0.1300794852 -0.1845863097 -1.798600e-01
## [3071,] 1.4165180878 1.0083428427 1.764104e+00
## [3072,] -1.0746872434 -0.1371225977 1.487945e-01
## [3073,] 0.5773282867 -0.4270238659 -5.613896e-01
## [3074,] -1.2987779318 0.9977111252 -1.118248e+00
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## [3076,] -1.1767395116 -1.3182299847 1.492516e+00
## [3077,] -1.2003362698 0.6937598785 -7.890816e-01
## [3078,] 0.7996180477 -0.2543557736 -3.789011e-01
## [3079,] 1.3282607416 -1.4406991126 -1.604941e+00
## [3080,] -0.8645176939 -1.4835843357 1.236915e+00
## [3081,] -1.2975920479 1.7374373473 -1.931367e+00
## [3082,] -0.7139793747 1.2327007643 -9.321021e-01
## [3083,] -1.0597898590 0.9956879503 -9.357818e-01
## [3084,] 0.5058824527 0.4534790039 1.809285e-01
## [3085,] 1.4023510206 0.3265414432 6.198446e-01
## [3086,] -1.2768468143 -0.2087863077 2.599521e-01
## [3087,] -1.0827800793 -1.4655885464 1.546075e+00
## [3088,] -1.2219200609 -1.2872328332 1.525679e+00
## [3089,] -0.1445362632 -0.3135864499 -1.732017e-01
## [3090,] 0.3049578485 -0.2229428936 -3.740480e-01
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## [3092,] 1.6293273049 -0.3209602748 -4.898577e-01
## [3093,] -1.1695372651 -1.4672717897 1.677655e+00
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## [3095,] -0.5185810135 -1.4972199519 7.904735e-01
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## [3097,] 1.0109278926 0.3425398688 1.029003e-01
## [3098,] -1.1117193589 -0.2070310269 2.212900e-01
## [3099,] -1.2109927315 -1.5017829342 1.777487e+00
## [3100,] -0.9875558819 0.5110143939 -5.402329e-01
## [3101,] -0.2116275328 -0.4838898894 -1.349007e-01
## [3102,] 0.9144458033 -1.5692119358 -1.170249e+00
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## [3104,] 0.2979469324 1.3250413419 2.272177e-01
## [3105,] 1.1501754369 -1.3614013181 -1.429318e+00
## [3106,] -1.2103158173 -1.5150736484 1.793086e+00
## [3107,] 1.4691405357 0.9329910419 1.646767e+00
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## [3109,] 0.0516922045 1.0342219995 -1.050403e-01
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## [3110,] -1.1548249919  0.5813301944 -6.263479e-01
## [3111,] -0.8459068505  0.8680143227 -8.542772e-01
## [3112,]  0.3961430618  0.7455713847  1.785172e-01
## [3113,]  1.3679916768  1.0907311679  1.756099e+00
## [3114,]  0.6566793307 -1.5499704677 -9.023835e-01
## [3115,] -0.0727744382  0.7660964236 -4.659215e-01
## [3116,]  1.7156173562 -1.4177551009 -2.155476e+00
## [3117,] -0.6644345519 -0.0791781458 -1.496902e-02
## [3118,]  1.7031265467 -1.5669001587 -2.528976e+00
## [3119,] -0.6918140756  0.3020779657 -2.531617e-01
## [3120,]  1.3962984513  0.3270762369  7.775927e-01
## [3121,] -1.0799340712 -1.5227015791  1.614758e+00
## [3122,] -0.1834754994 -0.8521658705  5.037551e-02
## [3123,] -0.0283414020 -1.1443211808 -6.372413e-02
## [3124,] -1.0400372334 -1.4751802740  1.523209e+00
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## [3126,] -0.3672479725  0.4219906225 -4.734029e-01
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## [3128,] -1.3170748589  0.5810618518 -6.670588e-01
## [3129,]  1.6322467642 -0.6397037718 -8.423184e-01
## [3130,]  0.3089719035 -1.5542532526 -3.643801e-01
## [3131,]  0.1216510732  1.1648093226 -1.189338e-01
## [3132,] -0.6452108152  0.3118713991 -4.262025e-01
## [3133,]  0.2068399885  1.4499788176  1.550108e-01
## [3134,] -1.2609876812 -0.5201687552  6.254084e-01
## [3135,] -1.1887620806 -1.1110545591  1.288024e+00
## [3136,] -0.7889543854  0.5576308845 -4.949383e-01
## [3137,] -1.3165649569  1.3622539666 -1.566589e+00
## [3138,] -1.2116696457 -1.4884922199  1.761888e+00
## [3139,] -0.8186081116  0.4388572577 -4.936153e-01
## [3140,] -0.9926930751 -1.5261766248  1.483421e+00
## [3141,] -1.1994671841  0.6441615606 -6.873154e-01
## [3142,] -1.2032157118  1.4872142560 -1.630330e+00
## [3143,] -0.8151478970  1.4597342185 -9.963453e-01
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## [3146,] -0.5325234446 -1.2975412660  6.552799e-01
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## [3148,] -0.3505303172  1.1546024423 -6.003708e-01
## [3149,] -0.3546855267 -0.2882381517 -9.576685e-02
## [3150,] -1.1914371064  0.4974178495 -5.297088e-01
## [3151,]  0.0051137205 -1.5173796659 -5.824015e-03
## [3152,] -0.1672055636 -1.5434340085  2.829238e-01
## [3153,] -0.9223710174 -0.5692948994  4.605394e-01
## [3154,] -0.5514297209 -0.4358876879  6.395356e-02
## [3155,] -1.2782225583  1.3361121689 -1.432210e+00
## [3156,]  1.6180747177 -0.7653434232 -1.230681e+00
## [3157,] -0.6485209616 -1.5273737736  1.052111e+00
## [3158,] -0.5662298115  0.2702964133 -2.447043e-01
## [3159,]  0.1957071182  0.8650650567 -2.358919e-01
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## [3160,] -0.1672393363 1.2952450095 -3.888696e-01
## [3161,] -0.2128090224 -1.4962738924 2.865954e-01
## [3162,] -0.7181263315 -0.4441661318 1.602496e-01
## [3163,] 1.2770188012 0.1145252932 1.407465e-01
## [3164,] 0.9141714086 -1.5721407893 -1.155678e+00
## [3165,] 0.8091604878 0.0339688064 -2.775770e-01
## [3166,] -0.2790354861 1.2981221504 -6.871283e-01
## [3167,] -0.3463925252 -1.4758629487 5.169652e-01
## [3168,] -0.3937505878 1.1585345745 -5.507358e-01
## [3169,] -0.5151640244 -1.5224082048 7.639407e-01
## [3170,] 1.1517463620 -0.7748593259 -7.911709e-01
## [3171,] -0.6745153542 0.7289589123 -7.038185e-01
## [3172,] 0.9366146062 -1.3650277738 -1.189415e+00
## [3173,] 1.7291483206 -0.7073798370 -1.066286e+00
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## [3175,] -0.0838980224 -1.5318230213 2.170753e-01
## [3176,] -1.1254137520 -1.4838663395 1.636092e+00
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## [3178,] 0.4168670881 0.9435776638 2.128481e-01
## [3179,] -1.1577853651 -0.8607480411 9.214644e-01
## [3180,] 1.5232634770 0.3338016935 6.530123e-01
## [3181,] -1.2218233589 -1.2891315066 1.527907e+00
## [3182,] 1.2608459986 -1.5425526130 -1.730110e+00
## [3183,] -0.0106246441 0.8641698178 -1.928661e-01
## [3184,] -0.9731893051 -0.3762443132 2.347493e-01
## [3185,] -0.6030481412 -1.5033815103 8.731107e-01
## [3186,] 1.4487180745 -0.5061691266 -6.598809e-01
## [3187,] -0.7581742570 -1.1548588619 8.453839e-01
## [3188,] 1.2681309262 -1.5721731638 -1.847176e+00
## [3189,] -1.1232367709 -1.5168311512 1.661690e+00
## [3190,] 0.4827739117 -0.3484976828 -4.263778e-01
## [3191,] -0.9988609312 0.7613570086 -8.720374e-01
## [3192,] -1.1261969941 -1.4752050407 1.634919e+00
## [3193,] -0.4376362624 0.2577043733 -3.635573e-01
## [3194,] 0.1797376747 1.3621263638 1.158403e-02
## [3195,] 1.6661470342 -1.4095021489 -1.952415e+00
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## [3197,] 0.6781217269 0.3839578529 1.344064e-01
## [3198,] -1.2802313853 -0.1423327366 1.819584e-01
## [3199,] 1.5329404131 0.4447956086 1.196324e+00
## [3200,] 0.4773428592 -1.5218226560 -5.653658e-01
## [3201,] 1.4040760878 1.3678321612 2.264495e+00
## [3202,] -0.9946422580 -1.4860780689 1.433912e+00
## [3203,] -1.0374905940 -1.4984504095 1.514734e+00
## [3204,] 0.6314538353 0.1056492656 -9.276995e-02
## [3205,] -1.3548853529 1.3234431748 -1.538360e+00
## [3206,] 1.3214074938 -0.1328277623 -4.045627e-01
## [3207,] -0.5177494046 -1.4992456156 7.737039e-01
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## [3212,] -1.2709479904 -0.3246053888 3.958840e-01
## [3213,] -1.1696135772 -1.4653165130 1.674749e+00
## [3214,] 1.4152972051 0.2389546188 4.996065e-01
## [3215,] -0.2266169745 -1.3417314560 2.612668e-01
## [3216,] 1.5065737487 0.1491619162 4.790582e-01
## [3217,] -1.1452289747 -1.1162853698 1.233429e+00
## [3218,] -1.2187013010 -0.5418632622 6.449466e-01
## [3219,] -1.1452237271 -1.1141036798 1.227809e+00
## [3220,] -1.0706958310 0.5497124633 -6.051854e-01
## [3221,] -0.8167460048 0.4071854642 -4.629889e-01
## [3222,] -0.9531527293 -1.4601408554 1.354726e+00
## [3223,] -0.8192886109 -0.1564359216 -5.665141e-02
## [3224,] 0.6988962215 1.1881236184 7.975632e-01
## [3225,] -0.9080667464 1.2397909971 -1.230982e+00
## [3226,] 1.4798575324 -1.5758057140 -2.020629e+00
## [3227,] -0.7668349299 0.8440287045 -7.193600e-01
## [3228,] 0.1933268110 -0.3821415689 -2.694495e-01
## [3229,] -1.1021753010 -1.1120114925 1.167556e+00
## [3230,] -0.2122897112 -1.5186706086 3.292146e-01
## [3231,] 1.2865450416 -0.8222366006 -9.857317e-01
## [3232,] -0.6506143344 -0.2185166765 -2.816083e-02
## [3233,] 1.5668355299 -1.5648409985 -2.181332e+00
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## [3237,] -1.2122498579 -1.4771001792 1.748518e+00
## [3238,] -1.0396107836 -1.4696621868 1.498136e+00
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## [3240,] -0.9018363027 -0.2201155935 1.200412e-01
## [3241,] -0.4368950825 0.7578126218 -5.629748e-01
## [3242,] -1.1958583831 -0.1559365754 1.514537e-01
## [3243,] 1.4275126082 1.1728382403 2.138367e+00
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## [3268,] -1.3313867594  0.8620655239 -9.968608e-01
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## [3360,] -0.4293971887 -1.5148057252 6.435206e-01
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## [3407,] -1.2471360762 0.0120003362 8.343698e-04
## [3408,] -0.2086286842 0.8343817476 -2.961443e-01
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## [3410,] 1.3997111566 0.3430514163 6.477540e-01
## [3411,] -0.8534591681 0.3359953376 -3.956569e-01
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## [3461,] 1.8450099218 -1.4172934262 -2.328128e+00
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## [3463,] -1.2114762416 -1.4922895669 1.766345e+00
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## [3465,] -0.9778124458 -0.3262317972 2.306177e-01
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## [3468,] 0.2542518767 1.3319896954 2.817545e-01
## [3469,] 1.2617655673 0.4445392859 7.890844e-01
## [3470,] -1.1688993605 -1.4698351847 1.667328e+00
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## [3472,] -0.6170644425 0.4481317731 -4.318382e-01
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## [3512,]  1.3625646038  1.1450133012  1.762371e+00
## [3513,] -1.2109927315 -1.5017829342  1.777487e+00
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## [3610,] -0.3788527880 1.5050683030 -7.364212e-01
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## [3640,] -0.8621883889 -1.5247947792 1.279226e+00
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## [3642,] -1.0192241962 0.3563084738 -3.956806e-01
## [3643,] 0.6807183445 0.7266826987 2.816267e-01
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## [3728,] -0.2131225395 -0.9774223035 6.781010e-02
## [3729,] 1.4438731738 1.0665572899 1.975349e+00
## [3730,] -1.2937603961 0.9466263438 -1.121789e+00
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## [3732,] -1.1025261543 -0.3375431151 3.075437e-01
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## [3734,] -0.2272799475 -1.3479061415 2.942062e-01
## [3735,] -1.2703532885 0.4741591126 -5.500234e-01
## [3736,] 1.4516198944 0.9493666805 2.066155e+00
## [3737,] 0.2187704856 1.3704080143 4.133058e-02
## [3738,] -1.1431343005 -0.3827047971 4.118617e-01
## [3739,] -0.2933558693 0.4313023065 -2.859901e-01
## [3740,] -1.1138350831 1.2794680532 -1.304700e+00
## [3741,] -1.3067277417 0.3779037915 -4.286209e-01
## [3742,] -1.1606696916 -0.0348003878 -1.291444e-03
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## [3744,] -1.3148712487 1.3127777130 -1.486804e+00
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## [3763,] 0.8927991363 0.2909963504 1.078198e-01
## [3764,] 0.4572843497 -1.3261197249 -5.298098e-01
## [3765,] 1.2192341618 -1.5536595026 -1.684969e+00
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## [3767,] -1.3571094996 1.3671126644 -1.589613e+00
## [3768,] -1.2221134650 -1.2834354862 1.521222e+00
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## [3770,] 0.2379657115 1.0726209447 2.849408e-01
## [3771,] 0.4792631288 -0.3235698051 -3.967254e-01
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## [3782,] 0.9289416668 0.7867506071 1.141877e+00
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## [3997,] 0.3936727090 -1.5149361599 -5.364590e-01
## [3998,] 1.6412633025 -0.1321800738 -2.013542e-01
## [3999,] -1.2198893183 -1.3271049758 1.572475e+00
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## [4001,] 1.1064547121 -1.3718612016 -1.330371e+00
## [4002,] 0.8126165825 -0.3808054735 -4.028767e-01
## [4003,] 1.1869997943 0.5216542738 4.074988e-01
## [4004,] -1.2128300701 -1.4657081384 1.735147e+00
## [4005,] -0.2563646202 -1.5214452329 4.181637e-01
## [4006,] -1.2711413945 -0.3208080419 3.914272e-01
## [4007,] -1.2368372942 -0.1826234154 2.191013e-01
## [4008,] 0.6385649729 1.2659138121 1.111400e+00
## [4009,] 0.1936819591 -0.3464817057 -3.683759e-01
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## [4010,] -1.2610843833 -0.5182700817 6.231800e-01
## [4011,] -0.1588667665 -0.1539932707 -1.974846e-01
## [4012,] -1.0590545222 0.3566484997 -4.261255e-01
## [4013,] -0.8467343682 1.4417842052 -1.197528e+00
## [4014,] 1.6572068068 -0.2114462134 -4.212816e-01
## [4015,] -1.2130234741 -1.4619107915 1.730691e+00
## [4016,] -0.8178257131 -1.5320569139 1.207929e+00
## [4017,] 0.5671034187 -1.5421416342 -7.206114e-01
## [4018,] -0.9632858467 -1.3018982918 1.223508e+00
## [4019,] -1.1954875273 0.5750257275 -6.182246e-01
## [4020,] 1.4205330865 1.2704874028 2.076491e+00
## [4021,] -0.3993576981 -1.3451173866 5.041403e-01
## [4022,] 1.0734342736 1.1815966978 1.734535e+00
## [4023,] 1.0685017923 -0.7602900336 -7.927526e-01
## [4024,] -1.1047861965 -0.3264801079 3.391543e-01
## [4025,] 1.4309234489 1.1324630627 2.150151e+00
## [4026,] 1.3966769921 0.4061434859 5.689952e-01
## [4027,] 1.4679404695 -0.3405040289 -5.048261e-01
## [4028,] -0.9634911567 -0.5747025712 4.784377e-01
## [4029,] 0.7159256557 0.8370349638 1.554856e-01
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## [4031,] 1.2800829354 -1.3876827584 -1.548316e+00
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## [4034,] 1.2441829342 -1.0820907839 -1.372450e+00
## [4035,] 0.5830821518 -0.2098959539 -1.816093e-01
## [4036,] -1.1044497312 -0.3103762097 2.898511e-01
## [4037,] 1.1110562125 -0.1838895555 -1.298461e-01
## [4038,] 1.4752732582 0.3873387980 7.033984e-01
## [4039,] -0.7703353736 0.3731017043 -5.207299e-01
## [4040,] 0.5454902614 -0.5301899750 -5.418645e-01
## [4041,] 1.1901868988 0.7511608526 8.236463e-01
## [4042,] 1.0856915955 -0.3189290267 -2.003962e-01
## [4043,] 0.4324294590 1.0839125257 5.277459e-01
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## [4045,] 1.5004423532 0.7728342481 1.226375e+00
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## [4059,] -1.2115729437 -1.4903908934 1.764117e+00
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## [4060,] 0.9863137838 -0.1389354213 -1.935258e-01
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## [4062,] -0.6466517740 -1.5156834639 9.736086e-01
## [4063,] 1.3283237113 0.8621943806 1.219883e+00
## [4064,] 0.9086257545 0.1723975280 -1.021635e-02
## [4065,] -0.6109623464 -0.8192572280 4.388803e-01
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## [4069,] 0.9340444938 -0.7141321929 -6.041013e-01
## [4070,] 1.4058474356 0.8252424154 1.428071e+00
## [4071,] -0.8349173742 1.2687120521 -1.073313e+00
## [4072,] -0.4357194975 0.1763404992 -2.095219e-01
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## [4075,] -1.3079848681 0.4025865465 -4.575900e-01
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## [4077,] 1.3196038703 0.8661603282 1.439120e+00
## [4078,] -1.3243275112 0.7234623613 -8.341882e-01
## [4079,] -0.0160762426 -0.8094300164 -1.509599e-01
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## [4115,] -0.3071731652 1.1402146868 -6.273352e-01
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## [4159,] -1.1401375256 1.0551402461 -1.126272e+00
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## [4160,] 0.1356923795 -1.5222938356 -1.961454e-01
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## [4163,] -0.8055498190 1.4647076603 -1.261126e+00
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## [4183,] 1.4941506836 0.0803884463 -9.814609e-02
## [4184,] -0.9632388364 1.2950621507 -9.961776e-01
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## [4192,] 0.9865298403 -1.4543962799 -1.200378e+00
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## [4194,] 1.3826839827 -0.3380212694 -4.231586e-01
## [4195,] 1.8688668066 -1.5916162971 -2.517239e+00
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## [4202,] 1.5439571720 -0.3404642248 -3.499638e-01
## [4203,] 0.5197775297 -0.3956929700 -2.039144e-01
## [4204,] 1.1941106813 -0.1469756400 -2.526134e-01
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## [4209,] 1.4409699479 1.0628320584 2.061019e+00
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## [4212,] -0.9617769918 -1.2977096477 1.173325e+00
## [4213,] 0.6083842076 0.2409822709 1.736058e-01
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## [4233,] 1.1094495024 -1.0345323787 -1.180059e+00
## [4234,] -1.0734190286 1.2590828110 -1.239289e+00
## [4235,] -0.4187221487 -0.0516986873 -8.337415e-02
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## [4256,] -1.2587335393 0.2788681765 -3.648019e-01
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## [4270,] -1.2277484730 -0.3632690900 4.340537e-01
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## [4273,] -0.1827164865 -1.3112684415 1.073383e-01
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## [4277,] -1.1850841246 0.4045307529 -4.633284e-01
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## [4509,] 1.5362380025 0.4322786310 1.141095e+00
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## [4538,] -1.2587635345 -0.5638382448 6.766614e-01
## [4539,] -0.8844333590 0.8849765343 -9.607542e-01
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## [4810,] -1.2118630498 -1.4846948730 1.757431e+00
## [4811,] 1.2552265785 0.3119167310 2.176309e-01
## [4812,] 1.0452560696 -1.5561461752 -1.411830e+00
## [4813,] 0.9865224242 0.4698302798 4.245948e-01
## [4814,] 1.0351627349 -0.4627586285 -6.639502e-01
## [4815,] 1.4586788884 0.9689627425 1.831376e+00
## [4816,] -1.2777171325 -0.1916982466 2.398966e-01
## [4817,] 1.4905529051 0.7258766262 1.604295e+00
## [4818,] -0.4755687618 0.7396923239 -5.774426e-01
## [4819,] -1.0974711214 1.6907513339 -1.691599e+00
## [4820,] -0.7170837791 0.7108622497 -6.159724e-01
## [4821,] 0.3636772357 -0.8184282404 -4.213962e-01
## [4822,] -0.7936414249 -0.5750079101 3.208277e-01
## [4823,] 0.8577036695 0.1766203252 2.411304e-01
## [4824,] -0.5269419640 -0.7731605289 2.676533e-01
## [4825,] -0.0261166758 0.2259795186 -3.353371e-01
## [4826,] 0.5247392249 -1.5401672417 -6.885597e-01
## [4827,] 1.6317569791 -1.4200651720 -2.098464e+00
## [4828,] 1.1808832893 1.0218419691 1.464666e+00
## [4829,] -0.3356134833 0.5592656643 -5.732730e-01
## [4830,] -1.3083716762 0.4101812404 -4.665036e-01
## [4831,] 1.2373112256 1.1712120399 1.759243e+00
## [4832,] -1.0699726519 0.5127118364 -5.312342e-01
## [4833,] 0.5589495785 -1.0948989231 -5.534048e-01
## [4834,] -0.4287465556 1.1267854114 -6.276312e-01
## [4835,] -0.9431174909 -0.2108004876 1.051833e-01
## [4836,] 1.7385509404 -1.5599671356 -2.400994e+00
## [4837,] 0.3489587258 -1.5173177585 -4.316993e-01
## [4838,] -0.4416331269 -0.8145061637 2.822483e-01
## [4839,] -1.0589595903 0.3439093005 -3.966150e-01
## [4840,] 0.1579578790 0.3774658090 -1.716757e-01
## [4841,] -1.1941650939 1.2847913042 -1.359661e+00
## [4842,] 0.4131972040 -0.4801912332 -4.197500e-01
## [4843,] 0.7642332779 1.0223750066 5.731346e-01
## [4844,] -1.2265881322 0.4197286701 -4.871094e-01
## [4845,] 1.7391853675 -1.5538716947 -2.432984e+00
## [4846,] 0.7411015326 0.8371888999 5.698813e-01
## [4847,] -0.5427765177 -0.5483947416 1.191656e-01
## [4848,] 1.1455093328 1.0367201852 1.280560e+00
## [4849,] -0.1417898381 0.9216338003 -1.191531e-01
## [4850,] -0.4011537193 -1.3305991153 5.148732e-01
## [4851,] 1.0464528778 -0.3126124268 -2.614069e-01
## [4852,] 1.0771186711 1.1614850264 1.688219e+00
## [4853,] -0.7436975335 -0.7509817557 5.266978e-01
## [4854,] 0.6791395966 -0.2647454519 -4.156143e-01
## [4855,] -1.2691177217 0.4472493850 -5.148926e-01
## [4856,] 1.2173170022 -1.5221405380 -1.713764e+00
## [4857,] 1.3827941039 1.2376248833 2.074493e+00
## [4858,] -1.0147694503 -0.4154358161 3.496169e-01
## [4859,] -0.6731046046 0.0549533562 -1.240671e-01
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## [4860,] -0.0492121810  1.2338161180 -1.072881e-01
## [4861,]  0.0764037432  1.1587800086  9.009362e-03
## [4862,] -0.7136524855  0.7008835629 -6.810936e-01
## [4863,]  0.6588037525 -0.0849822695 -3.327217e-01
## [4864,]  1.0288551797  0.1929315115  7.556055e-03
## [4865,]  1.5574794113  0.3763881850  7.231833e-01
## [4866,] -0.9505645037 -1.5158023807  1.426538e+00
## [4867,]  0.1716970415  0.6254297294 -7.926077e-02
## [4868,]  0.4603498339  1.6634181640  4.909767e-01
## [4869,] -1.0172402779  1.6223062428 -1.475445e+00
## [4870,] -0.1267517398  0.3699761040 -2.049815e-01
## [4871,] -0.0356424553 -0.1749891721 -1.540935e-01
## [4872,]  0.5525131537  0.0671526611 -7.415718e-02
## [4873,]  0.9104864735 -1.5303593869 -1.163790e+00
## [4874,] -0.2088519767  0.4679056383 -4.460751e-01
## [4875,]  1.4132866155 -0.2642901295 -3.362594e-01
## [4876,] -0.9286140957 -1.1388547057  9.790634e-01
## [4877,]  0.2584470821  0.9777795210 -1.513318e-02
## [4878,]  1.4270060686  1.1735991875  2.149770e+00
## [4879,] -0.9528504522 -1.4961428013  1.437232e+00
## [4880,]  0.3918309292 -1.5135476505 -4.915363e-01
## [4881,]  0.3429393882  1.3303631147  1.077515e-01
## [4882,]  0.4286509662  1.5237972827  5.984326e-01
## [4883,]  0.7554360656  0.7946315130  3.000190e-01
## [4884,] -1.1751415344  0.2327565438 -2.931059e-01
## [4885,] -0.5642445140  0.7933624851 -5.345023e-01
## [4886,] -1.2167537938 -0.5472925126  6.073968e-01
## [4887,]  0.9989605206  0.0539849438  6.589422e-02
## [4888,]  0.4167758555  0.6294790944 -7.214655e-02
## [4889,] -0.2982553296 -0.4570413535 -7.840454e-02
## [4890,] -0.6307594517 -1.1295478197  6.622870e-01
## [4891,] -1.1351617056 -1.2833792205  1.388615e+00
## [4892,] -1.2134752746  0.9260086218 -1.027222e+00
## [4893,]  0.1266255226  0.7000720007 -1.586170e-01
## [4894,] -1.3178484752  0.5962512395 -6.848860e-01
## [4895,] -0.3195479360 -0.2279232473 -9.436219e-02
## [4896,] -1.1870175369  1.1702716361 -1.259816e+00
## [4897,] -0.1109275595  1.4746323289 -1.666541e-01
## [4898,]  1.2617754477 -1.5594765246 -1.712021e+00
## [4899,]  1.5004063633  0.6947179345  1.423580e+00
## [4900,]  1.8080067154 -1.4524476449 -2.343708e+00
## [4901,] -0.3092242823  1.4722043497 -3.309782e-01
## [4902,]  0.7027490979  0.5147835757  2.349215e-01
## [4903,] -0.1560546031  0.7523943117 -3.955389e-01
## [4904,]  1.5545551950  0.3639361937  8.313305e-01
## [4905,]  0.0720307510  0.8934745214 -2.860264e-01
## [4906,] -0.7857328079  0.5514042619 -5.639737e-01
## [4907,]  1.6029555992  0.0540376577  3.377120e-01
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## [4909,] -1.2859625262  0.7732325459 -8.911231e-01
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## [4910,] -0.6037481164 -1.5139931599 9.181701e-01
## [4911,] 0.9558111907 -1.5696248116 -1.179970e+00
## [4912,] 1.6932075085 -0.9862493162 -1.574014e+00
## [4913,] 1.8266267541 -1.5632918153 -2.554652e+00
## [4914,] 0.1637522684 1.1772746913 -1.803508e-01
## [4915,] 1.2175286135 -0.3160156946 -4.434592e-01
## [4916,] 0.8837632048 -0.5824374239 -6.898568e-01
## [4917,] -1.2425175934 -0.8828153861 1.051031e+00
## [4918,] 1.1258576266 1.1750401162 1.449591e+00
## [4919,] 1.2565212136 -0.3143470379 -3.960413e-01
## [4920,] 0.0466587452 -1.5584691856 8.192854e-02
## [4921,] -1.1352402032 -0.5059876500 5.140998e-01
## [4922,] 1.1912939621 0.4165504569 5.586881e-01
## [4923,] -1.2595371508 -0.5486488571 6.588342e-01
## [4924,] -0.8130813702 1.5391531424 -1.250195e+00
## [4925,] -0.2667112707 0.6067361396 -3.505706e-01
## [4926,] -1.1581635948 -0.0841885391 5.691800e-02
## [4927,] 1.4397674627 1.1700171482 1.823336e+00
## [4928,] 0.6772264707 -1.3892963120 -7.696104e-01
## [4929,] 0.4093171544 1.0028022592 2.625028e-01
## [4930,] 0.1231496245 0.4069171712 -4.072646e-01
## [4931,] -0.6980460800 1.0060419640 -7.814538e-01
## [4932,] -1.2099290092 -1.5226683422 1.801999e+00
## [4933,] -0.7026113042 0.4671454184 -3.840701e-01
## [4934,] -1.1248128496 -1.4908666987 1.637884e+00
## [4935,] -1.1463114948 -0.3243440288 3.487493e-01
## [4936,] 1.5181305565 0.3672291834 7.039482e-01
## [4937,] -0.8320320437 -1.3309437016 1.076068e+00
## [4938,] -0.3876507783 -1.5033252539 5.939036e-01
## [4939,] -1.2079985223 0.8090178525 -8.772521e-01
## [4940,] -0.3568926245 1.2452965283 -6.609964e-01
## [4941,] -1.1550918590 -0.1493434317 1.398718e-01
## [4942,] -1.1055671308 -0.3286480143 3.651277e-01
## [4943,] -1.2291628949 1.2118617278 -1.333047e+00
## [4944,] -0.1912363881 0.7309649241 -4.934774e-01
## [4945,] -1.3269648192 1.5544299928 -1.776049e+00
## [4946,] 0.0051827145 -1.5366922366 4.088313e-02
## [4947,] -1.3490832310 1.2095227672 -1.404657e+00
## [4948,] -1.3075980599 0.3949918527 -4.486765e-01
## [4949,] -1.0730190541 1.2796972576 -1.301594e+00
## [4950,] -0.6917361904 -1.4800851985 9.926851e-01
## [4951,] 0.9831669206 0.7916975444 7.806688e-01
## [4952,] -1.2123465599 -1.4752015057 1.746289e+00
## [4953,] 0.6153221887 0.9074371047 4.699084e-01
## [4954,] -0.5370867463 -0.6214517144 1.531574e-01
## [4955,] -0.6567327557 0.4770941436 -5.384520e-01
## [4956,] 0.5773033753 0.2092660757 -6.281659e-03
## [4957,] -0.2848457442 0.4310884232 -5.091412e-01
## [4958,] -1.0555476708 -0.4437326527 4.160343e-01
## [4959,] -0.5095696960 -0.4175904509 -5.776183e-03
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## [4960,] -1.2117137069  0.1662920582 -2.413525e-01
## [4961,]  1.5392737469 -0.5697904075 -7.272338e-01
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## [4963,] -0.9603660716 -1.3241325869  1.202623e+00
## [4964,] -0.4746864682 -1.5231186151  7.783037e-01
## [4965,]  1.7975135824 -1.4295660840 -2.125384e+00
## [4966,] -0.8718626824  1.2012117261 -1.009150e+00
## [4967,] -1.1591543674 -0.8472114698  9.234395e-01
## [4968,]  1.4695565217  0.9493156930  1.594819e+00
## [4969,]  1.4416266455 -0.4348360915 -6.526990e-01
## [4970,] -0.2150696337 -1.4787110980  3.018910e-01
## [4971,] -1.2586668325 -0.5657369182  6.788898e-01
## [4972,]  1.1553887160 -1.4119427079 -1.439370e+00
## [4973,] -0.3158057151 -1.3068223506  3.648260e-01
## [4974,] -0.7237898963 -0.3753706529  1.362754e-01
## [4975,]  1.0203940371  1.0698036135  1.256505e+00
## [4976,]  0.4096499895 -0.8905686460 -3.720146e-01
## [4977,]  0.4228756246 -0.2153275114 -2.630574e-01
## [4978,]  1.5614302534  0.3180079729  7.660092e-01
## [4979,] -0.8767479656  0.6917663962 -6.773460e-01
## [4980,]  1.8044830981 -1.4362238857 -2.291850e+00
## [4981,] -0.1232098751 -1.5365450587  1.857202e-01
## [4982,] -0.9727681936 -1.1223450609  1.021644e+00
## [4983,] -1.0500976627 -0.5347921971  5.015578e-01
## [4984,]  0.89444498979  1.1742682973  1.074898e+00
## [4985,]  0.9178787082 -1.2198312765 -1.061732e+00
## [4986,]  1.6510491106 -0.1982005221 -2.927050e-01
## [4987,] -0.6746328592  1.2375190274 -9.018999e-01
## [4988,] -1.0728466369  0.5632458373 -5.826525e-01
## [4989,]  0.5775259573  0.2293880737 -6.268647e-02
## [4990,] -1.2176151182 -0.5475164629  6.305994e-01
## [4991,]  1.0261425600  1.2392400044  1.756245e+00
## [4992,] -0.5598147673 -1.5094443894  8.284845e-01
## [4993,] -1.0587921519 -0.3855586754  3.551599e-01
## [4994,] -0.5243947738 -0.2463674971 -4.627765e-02
## [4995,]  1.6290070090 -0.8346825534 -1.343829e+00
## [4996,] -0.9060546198  0.5067754633 -5.187823e-01
## [4997,]  1.1178819067  1.2677566684  1.426293e+00
## [4998,]  0.1397747197  1.3165886371  9.988798e-02
## [4999,] -0.6965790582 -0.2070334047  7.464067e-02
## [5000,] -0.1734106627 -1.4934788301  3.205180e-01
## [5001,] -0.9942915827 -1.5002744360  1.460361e+00
## [5002,]  1.1571778600  1.3348936817  2.377785e+00
## [5003,]  1.0944080687  0.5926261199  5.099018e-01
## [5004,]  0.3350322690  0.9295536476  2.460486e-01
## [5005,] -0.7342346889 -1.4893192533  1.056427e+00
## [5006,] -0.2976866695 -0.9860202667  1.591181e-01
## [5007,]  1.6687932361 -0.6058174669 -8.115473e-01
## [5008,]  0.0745214710  0.0234791879 -3.187897e-01
## [5009,] -1.0385217240 -1.4926443799  1.527250e+00
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## [5010,] 0.4711710462 -1.0083983293 -6.165306e-01
## [5011,] 1.8719940529 -1.5764335639 -2.637583e+00
## [5012,] -0.8315617922 1.2693587985 -1.163140e+00
## [5013,] 0.5244071693 -1.5367547973 -6.884050e-01
## [5014,] -0.4295575044 0.6936642738 -5.946774e-01
## [5015,] 1.3970320462 1.1102815857 2.020185e+00
## [5016,] -1.3093386965 0.4291679750 -4.887875e-01
## [5017,] 1.8441850304 -1.4065806250 -2.333360e+00
## [5018,] -1.0998821531 0.3802254336 -4.887364e-01
## [5019,] -0.2567723874 -1.5074073552 3.936133e-01
## [5020,] -0.9721851786 0.9303759594 -9.213202e-01
## [5021,] 1.4465761667 1.1520773150 1.689441e+00
## [5022,] -1.0178254747 -0.3589057973 2.879192e-01
## [5023,] -1.1547037942 1.2985967023 -1.355055e+00
## [5024,] -1.0488400098 1.5306372578 -1.491068e+00
## [5025,] -0.8989727090 1.0461570688 -9.835356e-01
## [5026,] -1.2108960295 -1.5036816076 1.779715e+00
## [5027,] 0.7912693682 -1.2125666009 -9.816494e-01
## [5028,] -0.5494998893 0.5937435999 -4.205446e-01
## [5029,] -0.7278885946 0.8694072738 -7.302946e-01
## [5030,] -1.2861905932 0.7769336672 -8.944271e-01
## [5031,] -0.8195748374 -1.5174084549 1.217102e+00
## [5032,] -1.2878229573 0.7702350340 -8.346908e-01
## [5033,] -0.5911391691 1.2583152611 -9.957182e-01
## [5034,] -0.3895003824 -1.4824543639 5.900846e-01
## [5035,] -0.4291245327 -1.5075474538 6.181182e-01
## [5036,] -0.6168133014 1.0400659139 -8.490772e-01
## [5037,] -0.5319158531 1.5173001721 -1.050012e+00
## [5038,] 0.0625731906 0.5208678000 -1.778322e-01
## [5039,] -1.2606975752 -0.5258647756 6.320935e-01
## [5040,] 0.2567620218 0.2738960786 -3.554735e-01
## [5041,] 0.7604266837 0.9706324177 8.031882e-01
## [5042,] -1.2124432619 -1.4733028323 1.744061e+00
## [5043,] 1.2148184431 1.0723174917 1.522397e+00
## [5044,] 0.8224418243 1.1701867581 8.248236e-01
## [5045,] -0.5386977252 -0.5695786783 6.517683e-02
## [5046,] -0.7132933854 0.6758749718 -6.277013e-01
## [5047,] 1.5357659354 -0.5166816909 -7.684607e-01
## [5048,] 1.0260230205 -1.3776558326 -1.354727e+00
## [5049,] 1.5648477317 0.3881744607 4.998955e-01
## [5050,] -0.9928477809 0.5743402656 -5.602345e-01
## [5051,] -0.0463350134 -0.5271859531 -6.471510e-02
## [5052,] 0.0388262043 1.1610396208 -8.547271e-02
## [5053,] -0.5132080477 -0.9517468374 3.553355e-01
## [5054,] 0.9002002550 0.2465284946 2.500205e-02
## [5055,] 0.3117069640 -0.3212316734 -3.045089e-01
## [5056,] -0.5206375927 0.7059859404 -3.846558e-01
## [5057,] -1.2087991903 -0.7094155996 8.056262e-01
## [5058,] 0.1596402596 -1.3565133279 -1.655898e-01
## [5059,] 0.5273832112 -0.4005847488 -3.915395e-01
```

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## [5060,] -0.0952386880  0.0955482218 -3.438323e-01
## [5061,]  1.8208873518 -1.5445506782 -2.450877e+00
## [5062,] -1.1971894545  0.5941394523 -6.215105e-01
## [5063,]  0.0449777218  0.6930685221 -1.479706e-01
## [5064,] -1.3191056016  0.6209339945 -7.138551e-01
## [5065,] -0.4875968655  1.5120838795 -1.125301e+00
## [5066,] -0.3806403451 -0.4530886368 -7.590665e-02
## [5067,]  0.8743268411 -1.5566704419 -1.223761e+00
## [5068,]  0.3067465328  0.8709227989  6.031209e-02
## [5069,] -0.0636489164  1.0099211740 -2.418379e-01
## [5070,] -0.9515731732 -1.4947641438  1.400195e+00
## [5071,]  1.2819316998  0.8854942180  1.304228e+00
## [5072,] -0.7947914257  1.2540228302 -1.014588e+00
## [5073,]  1.3084560307  0.6513954963  1.195183e+00
## [5074,]  0.8415098112  0.0432009175 -7.454305e-02
## [5075,] -0.3409321962 -1.5062144165  4.496952e-01
## [5076,]  0.2996355061  0.1931519717 -2.030118e-01
## [5077,] -0.3026901828 -1.4806239519  4.567414e-01
## [5078,]  0.3688058408 -0.8258622417 -5.375244e-01
## [5079,]  0.6953137001 -1.5254579287 -9.029422e-01
## [5080,] -1.1693997832 -1.4690572566  1.678527e+00
## [5081,]  1.2131381416 -1.5770836762 -1.465884e+00
## [5082,] -0.9862710753 -0.2153517211  1.743789e-01
## [5083,] -1.1148542479  1.2961429103 -1.319804e+00
## [5084,] -1.0185790921 -1.0974320295  1.086662e+00
## [5085,] -0.9529782767 -1.4726593018  1.381592e+00
## [5086,]  0.6930272738 -0.0358733494 -2.791370e-01
## [5087,]  1.2476333839  0.5830117861  8.126521e-01
## [5088,]  1.0282674769 -0.7502358875 -8.369843e-01
## [5089,]  1.5014823985  0.4272021961  9.908693e-01
## [5090,]  0.0078131648  1.0926705418 -1.750559e-01
## [5091,] -1.2404314275  0.6673592523 -7.453825e-01
## [5092,] -0.7783532861 -1.4900480356  1.141384e+00
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## [5102,]  1.4085488795 -0.1322450859 -5.434764e-01
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## [5107,]  0.6672775385  0.5185552305  8.128492e-02
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## [5110,] 1.4131394133 -0.3145425827 -2.061366e-01
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## [5113,] -1.0158136206 -0.3771591520 2.808971e-01
## [5114,] -0.1498340916 0.2651106422 -4.113296e-01
## [5115,] -0.1727735527 -0.4674361914 -1.209849e-01
## [5116,] -0.7437861015 0.5114298272 -4.895809e-01
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## [5120,] 1.2021880178 1.4486207126 1.985498e+00
## [5121,] 0.4779522904 1.0647011750 4.559755e-01
## [5122,] -0.8398678737 0.7742555354 -7.774532e-01
## [5123,] -0.9307875678 -1.0993787861 9.370142e-01
## [5124,] 0.3677597384 0.9680080983 3.657252e-01
## [5125,] 1.6046535902 -0.1814117926 -1.919094e-01
## [5126,] -0.4531640860 1.4772559383 -8.663346e-01
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## [5130,] 0.7331389786 1.5272928960 1.198428e+00
## [5131,] 1.4082757029 1.0331383295 1.918459e+00
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## [5140,] -0.0697496398 -1.1591971156 -1.446524e-02
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## [5143,] -1.1689794818 -1.4787260941 1.691772e+00
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## [5160,] 1.0010105150 0.0271689789 7.938224e-02
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## [5260,] 1.4158093880 0.4350300355 1.070056e+00
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## [5353,] -1.0828231985 -1.4700424916 1.558399e+00
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## [6157,] -1.1864866201 0.4201414680 -4.656840e-01
## [6158,] -0.1766102965 1.3905896833 -3.820968e-01
## [6159,] 0.5210979721 0.7662207781 7.179040e-02
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## [6160,] -1.3266483600  0.7690305244 -8.876696e-01
## [6161,] -1.2602140650 -0.5353581429  6.432355e-01
## [6162,] -1.2108960295 -1.5036816076  1.779715e+00
## [6163,]  1.0046806706  0.5913659324  7.184909e-01
## [6164,] -0.9351004887  0.3636838057 -4.723405e-01
## [6165,]  0.0277892452  0.8989059065 -2.133150e-01
## [6166,] -1.1017121807 -1.1215614631  1.179376e+00
## [6167,] -0.0980749930  0.9060718935 -1.525695e-01
## [6168,]  0.3988098918  0.3849512539 -6.209287e-02
## [6169,] -1.1515129515 -0.1914191712  1.515108e-01
## [6170,]  1.0918476021 -1.5832263785 -1.491922e+00
## [6171,] -0.9520999117  1.2804747017 -1.252315e+00
## [6172,]  1.2425061843  0.9909798865  9.989765e-01
## [6173,]  1.0355873347  0.9169398321  1.241202e+00
## [6174,]  1.5325029619  0.4717538162  1.140093e+00
## [6175,]  0.5303744140 -0.3922810448 -4.910253e-01
## [6176,]  0.3983368313 -0.3329046053 -3.991865e-01
## [6177,]  0.5827954570  1.1747167246  6.533630e-01
## [6178,]  0.4352861983  1.4295266027  6.608701e-01
## [6179,] -0.9088014496 -1.4847716048  1.327366e+00
## [6180,] -0.4743791179 -1.5005941744  7.136349e-01
## [6181,]  1.5217193112  0.5826809034  1.144850e+00
## [6182,] -1.3290659107  0.8164973609 -9.433794e-01
## [6183,]  0.4351301957 -0.3546780972 -2.350660e-01
## [6184,] -0.6160198460  0.4748699622 -5.264721e-01
## [6185,] -0.8930116439  1.5910956493 -1.432789e+00
## [6186,]  1.3965394157  0.3624191215  6.824639e-01
## [6187,] -1.1898982987  0.4778512983 -5.209976e-01
## [6188,]  1.3215499861  1.1767396413  1.684201e+00
## [6189,] -0.6002352052 -0.3651096934  9.245309e-02
## [6190,] -0.1863211260 -1.3169408265  2.163374e-01
## [6191,]  0.3566399071  0.7749922420  6.641036e-02
## [6192,]  1.3040466857 -1.5790459449 -1.697424e+00
## [6193,] -1.1646046685  0.7947319829 -9.054372e-01
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## [6209,]  1.1660416471  0.3576720225  2.938402e-01
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## [6210,] 1.5988385239 -0.4138794583 -5.315416e-01
## [6211,] -1.2230804853 -1.2644487516 1.498938e+00
## [6212,] -0.8983968846 -0.2452415827 9.276233e-02
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## [6215,] -1.0594198337 0.3361302787 -3.649736e-01
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## [6217,] 1.4568535150 1.0159063657 1.761416e+00
## [6218,] 1.5398549392 -1.3840198092 -1.926441e+00
## [6219,] -1.2196266091 -0.4945881424 5.504949e-01
## [6220,] 1.5685618137 -0.2140358439 -2.378034e-01
## [6221,] 1.5498236244 0.3789737466 9.179196e-01
## [6222,] -1.2121531559 -1.4789988526 1.750746e+00
## [6223,] -1.3211363442 0.6608061371 -7.606513e-01
## [6224,] -1.2077677881 1.5330898054 -1.625936e+00
## [6225,] -1.1264902774 -1.4565151062 1.595671e+00
## [6226,] 1.2385911304 -1.3876208230 -1.534390e+00
## [6227,] -0.3566777790 -0.7939865518 1.507053e-01
## [6228,] -0.0824667543 1.2524107078 -3.564390e-01
## [6229,] -1.3086617823 0.4158772608 -4.731888e-01
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## [6232,] -1.3538216305 1.3025577667 -1.513848e+00
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## [6237,] 1.0477865363 0.3361174511 2.267371e-01
## [6238,] 0.9028875064 -0.0988650892 -2.543998e-01
## [6239,] 1.0521660086 0.6361148851 4.344430e-01
## [6240,] 1.1729766746 -0.2746050049 -4.529820e-01
## [6241,] -1.2348704445 0.5744406568 -6.581054e-01
## [6242,] 1.3648356633 0.8244698194 1.431476e+00
## [6243,] -1.2106059234 -1.5093776280 1.786400e+00
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## [6245,] 1.0686826621 -0.7684564208 -7.769896e-01
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## [6260,] -0.3028101831 -1.4766228331 4.498432e-01
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## [6267,] 1.2192588648 -0.0168712420 -1.639756e-01
## [6268,] -0.6066585659 -1.4895658542 9.333003e-01
## [6269,] -1.1690470374 -1.4680780195 1.666795e+00
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## [6271,] -0.4120430212 -0.6135585013 7.614456e-02
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## [6273,] -0.9960799854 -1.4640637923 1.416394e+00
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## [6275,] -1.2841078841 1.4996454125 -1.688373e+00
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## [6278,] -0.9085346417 -1.4883651798 1.329381e+00
## [6279,] -0.3189820479 0.7264066393 -3.538228e-01
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## [6289,] 1.1027326773 1.3210551581 1.690584e+00
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## [6295,] 1.4001913158 1.1168847277 1.920554e+00
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## [6304,] 0.7400862556 1.1872239542 7.936742e-01
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## [6310,] -0.7365308009 -1.4545180318 1.029346e+00
## [6311,] 1.0668818369 -1.3924777050 -1.314932e+00
## [6312,] -0.0943448971 0.0200130186 -1.775519e-01
## [6313,] 0.0447765173 -1.5376888609 7.919464e-02
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## [6315,] 0.1734482504 1.3424995371 2.262116e-01
## [6316,] -0.9897016146 0.5830741546 -6.648744e-01
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## [6318,] 1.3288180498 -0.8309654951 -9.984166e-01
## [6319,] -0.2537390868 0.9804311131 -5.538807e-01
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## [6321,] 0.4184411748 1.2249516183 5.410829e-01
## [6322,] -0.4548181342 0.9832820185 -6.583342e-01
## [6323,] 0.7108104418 -0.8634162087 -8.205190e-01
## [6324,] 1.2969321781 1.0221021199 1.643259e+00
## [6325,] 0.9716700810 1.1256380775 1.320405e+00
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## [6327,] -0.7680812425 0.3208469631 -4.486956e-01
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## [6329,] 0.8007601978 1.0388700554 6.481132e-01
## [6330,] -1.2125399640 -1.4714041588 1.741833e+00
## [6331,] -1.2698842681 -0.3454907968 4.203963e-01
## [6332,] -0.4692492286 1.2357822130 -9.133914e-01
## [6333,] -0.8882538498 1.4396021870 -1.177237e+00
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## [6337,] -1.2410514037 -0.0989685766 1.196957e-01
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## [6339,] -0.7295169569 0.2606471756 -2.345820e-01
## [6340,] -0.2728884545 0.2085619233 -2.643656e-01
## [6341,] 0.2626934750 -1.5393065933 -2.620343e-01
## [6342,] -1.1259916564 -1.4833035039 1.649868e+00
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## [6357,] -1.1297120295 1.5691298268 -1.615117e+00
## [6358,] 1.3039999610 -0.0727956834 -9.782991e-02
## [6359,] 1.6451079115 -0.7188581736 -9.815069e-01
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## [6360,] -1.3145415009  1.3201944737 -1.514105e+00
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## [6363,] -0.2267043194 -1.3224698282  2.151700e-01
## [6364,] -1.0816127001 -1.5056902996  1.616142e+00
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## [6373,] -1.2111861355 -1.4979855872  1.773030e+00
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## [6385,] -0.3388786560  1.0374164991 -6.122180e-01
## [6386,] -0.9932269039 -0.0699600945 -8.067295e-03
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## [6388,]  0.0652849871  0.9224246903 -1.814482e-01
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## [6392,]  1.6785109037 -0.3776858736 -5.636010e-01
## [6393,] -1.1955802107 -0.1573314795  1.476465e-01
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## [6399,] -0.6987400591 -0.1935283324  9.751256e-02
## [6400,]  1.3316129714  1.0508092229  1.736082e+00
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## [6402,]  1.1967146808  0.3882561518  4.872909e-01
## [6403,] -1.2676593356  0.4144568462 -4.708387e-01
## [6404,]  1.4473441405  1.0848613279  1.838128e+00
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## [6407,]  1.1571701150 -0.7446329047 -1.009675e+00
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## [6410,] -0.0984978381  0.5282062064 -2.686401e-01
## [6411,]  1.4362524439  0.4050959187  6.079171e-01
## [6412,] -0.0597042215  0.5119854980 -1.710469e-01
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## [6420,] -1.1004944830  0.3546872344 -4.084794e-01
## [6421,]  1.4234510599 -0.0609237331 -3.783683e-02
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## [6423,] -0.5162717982 -1.5341519204  8.225632e-01
## [6424,]  0.1274079611 -0.1248217797 -2.597907e-01
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## [6426,] -1.2710446924 -0.3227067153  3.936556e-01
## [6427,]  0.8821588490 -0.5673870815 -6.854987e-01
## [6428,]  1.4984980866  0.2264311685  4.971965e-01
## [6429,] -0.4438042415 -1.3272524600  5.510033e-01
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## [6432,] -0.1307334698  1.2726734110 -2.151870e-01
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## [6435,] -0.8627426633 -1.5068293669  1.248659e+00
## [6436,] -0.1030106989  0.5221796836 -1.348787e-01
## [6437,] -1.2273736228  1.1734863752 -1.283664e+00
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## [6439,]  1.0896793279  0.2829906130  3.355910e-01
## [6440,]  0.8948502525  1.0973632943  1.257590e+00
## [6441,] -1.2111861355 -1.4979855872  1.773030e+00
## [6442,] -0.0840153832 -1.5191460856  1.883108e-01
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## [6465,] -1.3559490752 1.3443285828 -1.562872e+00
## [6466,] -0.9944121836 -1.5049434737 1.475262e+00
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## [6468,] 0.8617250544 -0.1412313026 -1.425352e-01
## [6469,] 1.4351475790 1.1051812222 2.107663e+00
## [6470,] 0.9544550030 1.2858920464 1.370283e+00
## [6471,] -1.2797478752 -0.1518261039 1.931004e-01
## [6472,] -0.7733302245 -0.2741257807 1.075457e-01
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## [6474,] -1.3695840615 1.6120415408 -1.877076e+00
## [6475,] -0.8809163976 1.3147740641 -1.056485e+00
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## [6477,] 1.2783519394 0.0835521832 1.835214e-01
## [6478,] -1.1394664874 0.3119004280 -3.531340e-01
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## [6489,] 0.6674759839 1.1272926299 6.997446e-01
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## [6538,] -0.3054007047 -0.4140306654 1.352002e-03
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## [6610,] -0.3222404072  0.8343859039 -5.394626e-01
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## [6617,] -0.9045500355  1.1238604380 -1.032157e+00
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## [6624,]  0.0741830780 -0.0793149548 -5.163639e-02
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## [6629,]  1.5762119428 -0.5608221285 -6.441554e-01
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## [6640,] -0.3878974965 -1.5040101538  6.021093e-01
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## [6692,] -0.2838276889 1.2913201624 -5.440761e-01
## [6693,] -0.6491717277 0.8552716237 -6.107918e-01
## [6694,] -1.2183220168 -0.5256404971 5.942193e-01
## [6695,] 0.9347281704 1.1513334436 1.150336e+00
## [6696,] -0.3919813674 -0.4130567511 1.216163e-01
## [6697,] -1.2118630498 -1.4846948730 1.757431e+00
## [6698,] 1.8378956377 -1.4110375079 -2.156846e+00
## [6699,] -0.7840152638 0.4781558320 -4.250909e-01
## [6700,] 0.5984055786 1.0208429416 6.296418e-01
## [6701,] 0.6492465949 0.1182016295 -5.919887e-01
## [6702,] 0.5631381559 0.9991758201 5.345516e-01
## [6703,] -0.2348570763 0.7814621718 -5.503070e-01
## [6704,] 1.3419546342 0.7418344612 1.163986e+00
## [6705,] -0.8871515924 1.4599990782 -1.257455e+00
## [6706,] -0.9405352783 1.0546910491 -9.890349e-01
## [6707,] -1.2345433677 0.5580116568 -6.254266e-01
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## [6709,] -1.2354765630 0.5944292698 -6.923927e-01
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## [6710,] 1.8407860605 -1.4008464512 -2.258425e+00
## [6711,] 1.4740640723 0.3536423349 8.198404e-01
## [6712,] 0.6394443014 0.3853312563 7.106128e-02
## [6713,] 1.2505638596 1.0931444214 1.607034e+00
## [6714,] 0.7413468803 -1.5345840404 -1.013465e+00
## [6715,] 1.2962350637 -0.0120007136 -4.647024e-02
## [6716,] 0.3484424973 -1.5534247877 -3.274154e-01
## [6717,] -1.2694282492 0.4377188584 -4.827860e-01
## [6718,] -0.7501662486 -0.5630625573 2.246021e-01
## [6719,] 1.4070507583 1.2699009763 2.432347e+00
## [6720,] 1.4486117146 0.0432098176 1.157220e-01
## [6721,] -0.6051987098 -1.5158529455 9.609714e-01
## [6722,] -0.2127254867 -1.5263817064 3.600422e-01
## [6723,] -0.4182150281 0.9371420156 -4.279946e-01
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## [6737,] -1.1573011637 -0.1121341070 1.044591e-01
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## [6739,] -1.3377690935 0.9873779723 -1.143935e+00
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## [6741,] 0.5571268762 -1.0241095393 -6.833454e-01
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## [6760,] -1.2023466225  0.7336886244 -8.365560e-01
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## [6766,]  1.1755408896  0.3190286462  1.412400e-01
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## [6810,] 0.9944281534 0.7622797714 5.585764e-01
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## [6818,] -0.9081950937 -1.5307650270 1.426981e+00
## [6819,] -0.9061085718 -1.5011344092 1.297693e+00
## [6820,] 0.2636227183 -1.5150557519 -3.473869e-01
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## [6822,] 1.0392577467 -1.5229539562 -1.337556e+00
## [6823,] -0.6916041758 1.5176414166 -1.159585e+00
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## [6826,] -1.1329073023 0.9126774729 -9.583966e-01
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## [6828,] -0.8833673787 1.3946549318 -1.192753e+00
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## [6840,] 1.3973390647 -0.1698653668 -1.543099e-01
## [6841,] 0.1352667593 1.0010646586 -6.543190e-02
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## [6844,] -1.1683640062 -1.4813517528 1.682191e+00
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## [6848,] -0.3775997528 0.9086413291 -3.474316e-01
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## [6851,] -0.8252130144 1.1157806063 -9.441692e-01
## [6852,] -1.2241492628 1.1044209290 -1.194897e+00
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## [6856,] -1.3579798178 1.3842007255 -1.609669e+00
## [6857,] 1.6532440478 -1.5641256716 -2.301316e+00
## [6858,] -0.8616411618 1.1125624881 -1.055101e+00
## [6859,] 0.5747586494 -0.3973162069 -5.684839e-01
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## [6860,]	0.6557686397	0.2269388014	3.991954e-02
## [6861,]	0.6972984103	0.8438372560	6.280123e-01
## [6862,]	1.2009736797	0.3198957839	5.470909e-01
## [6863,]	1.3678669984	0.5168725061	1.048071e+00
## [6864,]	-0.0013241752	-0.5066432936	-2.229053e-01
## [6865,]	1.5257660652	-1.5744422404	-2.154230e+00
## [6866,]	1.0562849969	1.0433578865	1.456083e+00
## [6867,]	-1.3081782721	0.4063838934	-4.620468e-01
## [6868,]	-1.1451498137	1.1084067174	-1.128350e+00
## [6869,]	-0.5262581812	0.8507500048	-6.006221e-01
## [6870,]	1.8449612862	-1.4130941958	-2.337399e+00
## [6871,]	0.0877354782	-0.9901176391	-2.726318e-01
## [6872,]	1.4398351771	0.8108502533	1.647393e+00
## [6873,]	-0.0643096460	1.3869459349	-9.517291e-02
## [6874,]	-1.1555708443	-0.9109456196	9.893715e-01
## [6875,]	-0.8622253223	0.4806956696	-5.287820e-01
## [6876,]	-1.0876138371	1.5382444129	-1.567541e+00
## [6877,]	0.2502653522	-1.3744323263	-3.495893e-01
## [6878,]	-1.2475058181	0.8080875016	-9.129962e-01
## [6879,]	-1.2650330532	1.1560145522	-1.326421e+00
## [6880,]	0.8729497281	-0.2422656020	-1.837382e-01
## [6881,]	-1.1010288807	-1.1456700618	1.221986e+00
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## [6883,]	-1.0730560804	-0.1477642776	1.326554e-01
## [6884,]	-1.2990982317	1.7570944638	-1.941163e+00
## [6885,]	0.9838305909	-0.7106729283	-8.448890e-01
## [6886,]	-1.2583767264	-0.5714329386	6.855749e-01
## [6887,]	1.1681070526	0.3178961055	3.394836e-01
## [6888,]	-0.5196190952	1.3542283529	-9.635329e-01
## [6889,]	-1.2606008731	-0.5277634490	6.343219e-01
## [6890,]	0.6591196372	0.8335922054	5.807502e-01
## [6891,]	-0.1049536690	0.1834365126	-3.092836e-01
## [6892,]	0.9649096502	-0.0336528922	1.045709e-01
## [6893,]	0.0995691433	0.1446360732	-2.050304e-01
## [6894,]	1.4166716447	-0.8197372070	-1.182797e+00
## [6895,]	-0.0288574430	-0.6650400085	-1.777699e-01
## [6896,]	-0.1633763661	-1.5479738527	1.936793e-01
## [6897,]	0.3450781847	0.1498797678	-2.122253e-01
## [6898,]	-0.9428255516	-0.1753160947	8.359146e-03
## [6899,]	-1.2769435163	-0.2068876342	2.577237e-01
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## [6901,]	1.2199932678	-1.5428837034	-1.731995e+00
## [6902,]	-1.0138520368	0.9342861847	-9.124616e-01
## [6903,]	1.3214706397	1.1201741917	1.828401e+00
## [6904,]	0.3084387383	1.2241396930	2.049448e-01
## [6905,]	1.5013165122	0.7817623169	1.180967e+00
## [6906,]	0.6572187946	-1.5463057713	-9.257704e-01
## [6907,]	1.5596208602	0.3454918567	7.445189e-01
## [6908,]	-0.0921333371	1.3621045775	-3.779465e-01
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## [6910,] -0.0819729127 -1.5221445916 1.421579e-01
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## [6955,] 1.0604846751 0.7390039422 1.033820e+00
## [6956,] 0.8213827526 -0.8025099853 -6.503403e-01
## [6957,] -0.3713327260 0.9433758359 -5.994268e-01
## [6958,] -0.4548408451 0.4223217221 -3.249177e-01
## [6959,] -1.2130234741 -1.4619107915 1.730691e+00
```

```
## [6960,] -1.1923294588 0.5642885565 -6.742584e-01
## [6961,] -0.6855344397 1.3676228375 -9.422232e-01
## [6962,] 0.7844813189 1.3508669584 1.368676e+00
## [6963,] 0.7489390902 0.8394421860 3.582101e-01
## [6964,] 0.6482327244 1.0135805473 4.147121e-01
## [6965,] -0.3419304084 0.0566816483 -2.210770e-01
## [6966,] 1.2124319673 0.0768673670 -2.200384e-01
## [6967,] -0.3003126736 -0.4627526263 -9.978365e-03
## [6968,] 1.4952532737 0.2651001239 4.853350e-01
## [6969,] -1.2201794244 -1.3214089554 1.565790e+00
## [6970,] -0.6117817213 -0.8171976023 4.552429e-01
## [6971,] -1.0104274886 0.1965231030 -2.254592e-01
## [6972,] 1.6112149595 0.0682974976 8.478865e-02
## [6973,] -0.4411441067 0.7200116851 -3.563187e-01
## [6974,] 0.0734199297 -1.3480377480 -7.364397e-02
## [6975,] 0.2798843826 -0.8465563299 -3.012939e-01
## [6976,] -0.1837963557 1.0546284569 -4.256766e-01
## [6977,] -0.0273103602 1.4979385517 -2.700249e-01
## [6978,] -0.3997019312 0.2412653750 -2.428294e-01
## [6979,] -0.5420557775 0.4930499143 -3.632314e-01
## [6980,] 0.0595104158 0.9779092765 -1.690625e-01
## [6981,] -1.0767243792 1.3214220567 -1.309028e+00
## [6982,] 1.4408838830 0.8527697069 1.514510e+00
## [6983,] 0.6481300642 0.6669434194 2.117673e-01
## [6984,] 0.5966683930 -1.3802719397 -8.278755e-01
## [6985,] 0.9284596256 0.6579396576 4.016408e-01
## [6986,] 0.3578646642 0.0228413936 -2.291481e-01
## [6987,] -0.2533521974 0.4466133523 -2.994232e-01
## [6988,] -0.8365199730 0.7228700221 -7.363524e-01
## [6989,] -1.1564283596 -0.9003233837 9.852241e-01
## [6990,] 1.6508174088 -1.5448566549 -2.285943e+00
## [6991,] -1.1847341092 -0.3526029717 3.531545e-01
## [6992,] 1.1352378810 1.0667185093 1.475177e+00
## [6993,] -0.1774983245 -0.9699345680 1.891461e-01
## [6994,] 0.1318316565 1.0001971593 2.703920e-02
## [6995,] -0.2571150012 -1.5386981781 4.812335e-01
## [6996,] 0.1883601502 1.3210490456 -1.118554e-01
## [6997,] 1.6550185095 -0.2977045443 -1.470479e-01
## [6998,] -1.2374939965 0.5909959125 -6.307386e-01
## [6999,] -0.4322810931 0.6492623984 -4.115332e-01
## [7000,] -1.3173649650 0.5867578722 -6.737440e-01
## [7001,] -1.1661957745 0.0322096242 -2.439356e-02
## [7002,] 1.1525846077 0.4720132827 3.602887e-01
## [7003,] 0.2208120566 0.9300357345 1.752366e-02
## [7004,] 0.2774863953 0.7835815033 -2.768055e-02
## [7005,] 0.0070404822 0.7116665690 -2.740464e-01
## [7006,] -1.2699809701 -0.3435921234 4.181679e-01
## [7007,] 0.9564200748 -1.5202578328 -1.320003e+00
## [7008,] -1.3100156107 0.4424586892 -5.043862e-01
## [7009,] 0.4347843605 -1.5290561514 -5.050731e-01
```

```
## [7010,] -0.7331587641 -1.5253406432 1.118646e+00
## [7011,] -0.8299583468 -0.0343569905 -8.290716e-02
## [7012,] 1.4592061183 0.9725934769 1.808396e+00
## [7013,] 1.1074846538 1.0290700287 1.222728e+00
## [7014,] 0.4192389276 0.6211468292 -1.159545e-01
## [7015,] -0.6702397929 1.2063719161 -9.391179e-01
## [7016,] -0.9198235087 -0.5947297438 4.574803e-01
## [7017,] -0.8197105748 0.4596351195 -5.168391e-01
## [7018,] 1.4909360454 -0.2228767265 -3.282598e-01
## [7019,] -1.0471118020 -0.5741800144 5.220320e-01
## [7020,] -1.1687257773 -1.4801889222 1.688778e+00
## [7021,] 0.9651576169 -0.2774619154 -3.659341e-01
## [7022,] -1.3198792178 0.6361233821 -7.316822e-01
## [7023,] 0.2237684250 0.1458508315 -2.430682e-01
## [7024,] 1.2687760682 0.9659982413 1.447767e+00
## [7025,] -0.5875588994 0.6055022397 -5.262364e-01
## [7026,] -0.8321997062 -0.0037380183 -1.009198e-01
## [7027,] 1.8676339423 -1.5256908652 -2.650463e+00
## [7028,] -0.3982583738 0.7866658993 -5.745006e-01
## [7029,] 1.4699167915 0.9264774711 1.642728e+00
## [7030,] -0.8014408239 -1.1423867609 8.747801e-01
## [7031,] -1.1941062912 0.5615231181 -6.206066e-01
## [7032,] 1.2211564715 1.0725751442 1.355154e+00
```

*# Play with FA utilities*

**fa.parallel**(tablechurnFA) *# See factor recommendation*

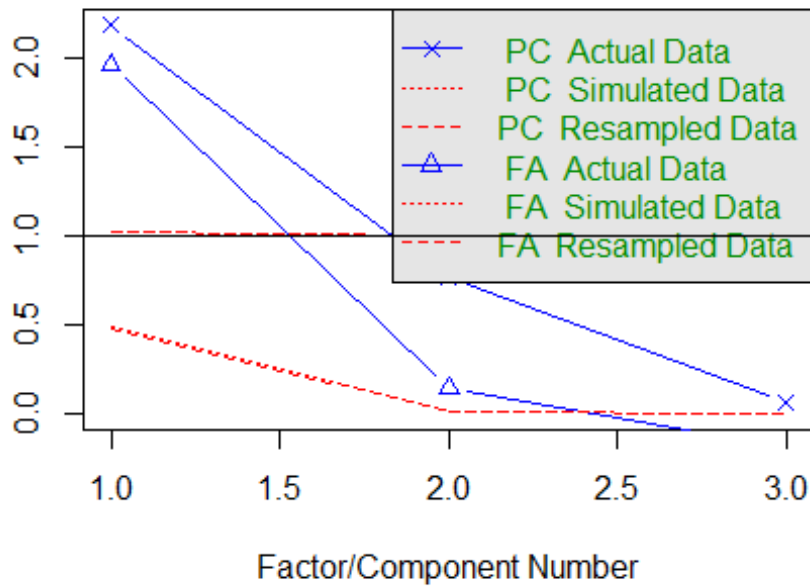
```
## Warning in fac(r = r, nfactors = nfactors, n.obs = n.obs, rotate =
## rotate, : A loading greater than abs(1) was detected. Examine the loadings
## carefully.
```

```
## 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 extraction method.
```

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

eigenvalues of principal components and factor analysis

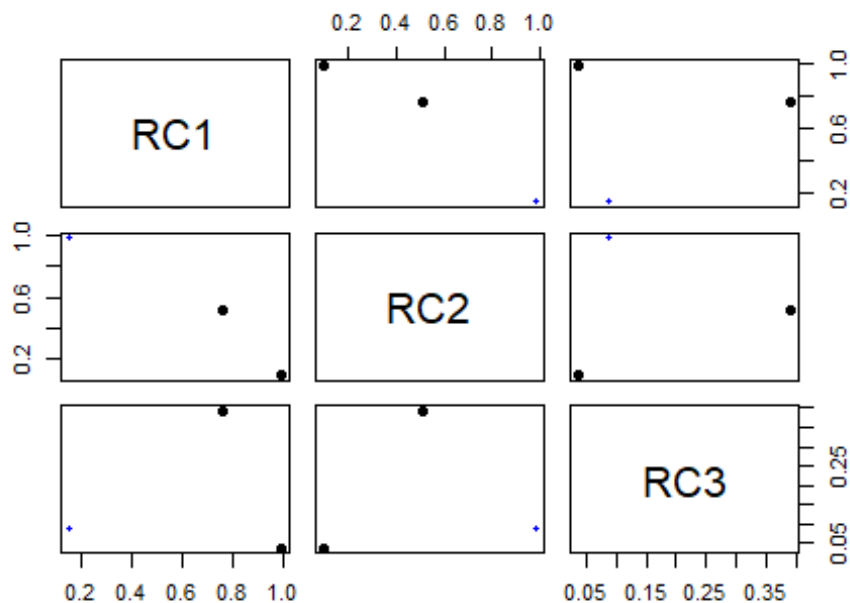
## Parallel Analysis Scree Plots



## Parallel analysis suggests that the number of factors = 2 and the number of components = 1

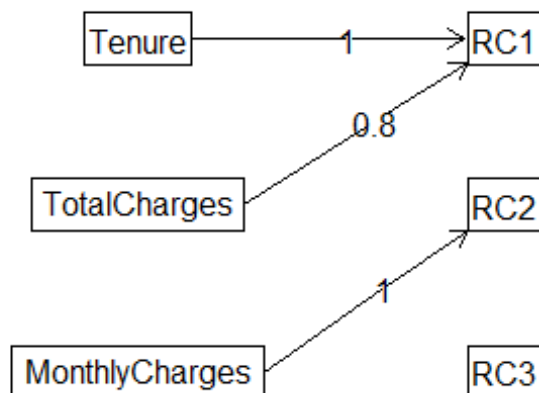
`fa.plot(fit.pc)` # See Correlations within Factors

## Principal Component Analysis

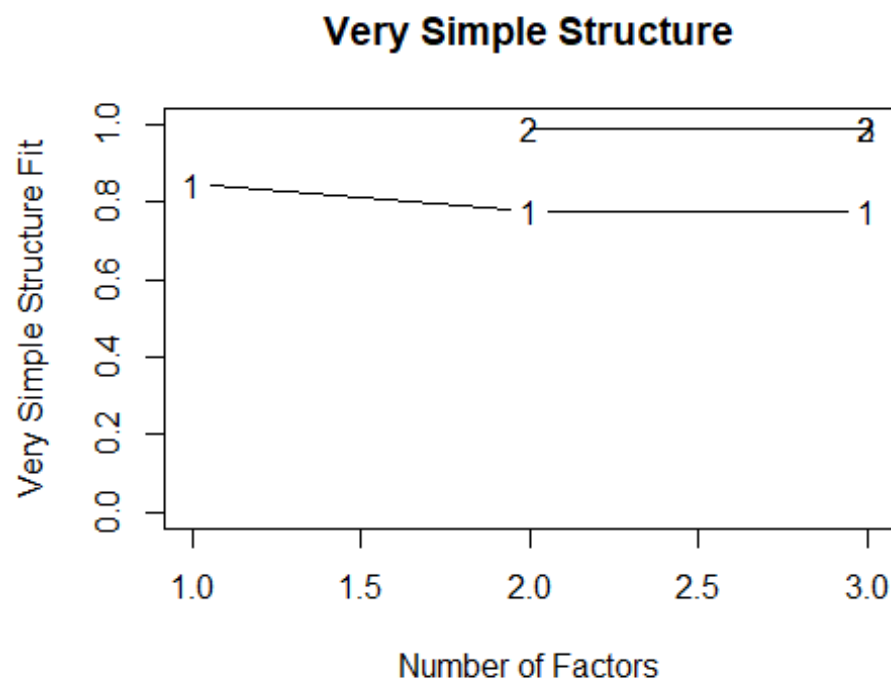


```
fa.diagram(fit.pc) # Visualize the relationship
```

## Components Analysis



```
vss(tablechurnFA) # See Factor recommendations for a simple structure
```



```
##
## Very Simple Structure
## Call: vss(x = tablechurnFA)
## VSS complexity 1 achieves a maximum of 0.85 with 1 factors
## VSS complexity 2 achieves a maximum of 0.99 with 2 factors
##
## The Velicer MAP achieves a minimum of NA with 1 factors
## BIC achieves a minimum of NA with factors
## Sample Size adjusted BIC achieves a minimum of NA with factors
##
## Statistics by number of factors
##   vss1 vss2 map dof   chisq prob sqresid fit RMSEA BIC SABIC complex
## 1 0.85 0.00 0.34  0 4.5e+03  NA   0.816 0.85   NA  NA   NA    1.0
## 2 0.78 0.99 1.00 -2 3.1e-12  NA   0.058 0.99   NA  NA   NA    1.3
## 3 0.78 0.99  NA -3 3.1e-12  NA   0.058 0.99   NA  NA   NA    1.3
##   eChisq SRMR eCRMS eBIC
## 1 4.6e+02 1.0e-01  NA  NA
## 2 3.0e-14 8.4e-10  NA  NA
## 3 3.0e-14 8.4e-10  NA  NA
```

*##Looking at the output obtained from this step we infer that we just need 2 factors in our case.*

*##i.e. RC1 and RC2 since most of the variance is explained by these factors itself and all the 3 variables in scope of this analysis are explained by RC1 and RC2 factors.*