

```
# Packages
#install.packages("neuralnet")
#install.packages("mlbench")

# Libraries
library(keras)
library(mlbench)
library(dplyr)

##
## 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(magrittr)
library(neuralnet)

##
## Attaching package: 'neuralnet'

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

library(gapminder)
library(data.table)

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

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

# Data
data <- read.csv('Preqin_mod.csv', row.names = NULL, stringsAsFactors = FALSE)
str(data)

## 'data.frame':    5489 obs. of  89 variables:
## $ X                                     : int  1 2 3 4
## $ IRR                                  : num  7.88
## $ Fundsize                             : num  167 175
```

```

## $ ImpactDUM : int 0 0 0 0
0 0 0 0 0 0 ...

## $ Early_StageDUM : int 1 1 1 0
0 0 0 0 0 0 ...

## $ GrowthDUM : int 0 0 0 1
0 0 0 0 0 0 ...

## $ BuyoutDUM : int 0 0 0 0
1 1 0 0 0 0 ...

## $ Fund_of_FundsDUM : int 0 0 0 0
0 0 1 1 1 1 ...

## $ Venture_GeneralDUM : int 0 0 0 0
0 0 0 0 0 0 ...

## $ Early_Stage_SeedDUM : int 0 0 0 0
0 0 0 0 0 0 ...

## $ Co_InvestmentDUM : int 0 0 0 0
0 0 0 0 0 0 ...

## $ North_America_DUM : int 1 1 1 1
1 1 1 1 1 0 ...

## $ Europe_DUM : int 0 0 0 0
0 0 0 0 0 1 ...

## $ Asia_DUM : int 0 0 0 0
0 0 0 0 0 0 ...

## $ Diversified_Multi_Regional_DUM : int 0 0 0 0
0 0 0 0 0 0 ...

## $ Americas_DUM : int 0 0 0 0
0 0 0 0 0 0 ...

## $ Africa_DUM : int 0 0 0 0
0 0 0 0 0 0 ...

## $ Middle_East_and_Israel_DUM : int 0 0 0 0
0 0 0 0 0 0 ...

## $ Australasia_DUM : int 0 0 0 0
0 0 0 0 0 0 ...

## $ X1969 : int 0 0 0 0
0 0 0 0 0 0 ...

## $ X1971 : int 0 0 0 0
0 0 0 0 0 0 ...

## $ X1972 : int 0 0 0 0
0 0 0 0 0 0 ...

## $ X1976 : int 0 0 0 0
0 0 0 0 0 0 ...

## $ X1977 : int 0 0 0 0
0 0 0 0 0 0 ...

## $ X1978 : int 0 0 0 0
0 0 0 0 0 0 ...

## $ X1979 : int 0 0 0 0
0 0 0 0 0 0 ...

## $ X1980 : int 0 0 0 0
0 0 0 0 0 0 ...

## $ X1981 : int 0 0 0 0
0 0 0 0 0 0 ...

```

## \$ X1982	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X1983	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X1984	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X1985	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X1986	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X1987	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X1988	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X1989	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X1990	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X1991	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X1992	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X1993	: int	0 0 0 0
1 0 0 0 0 0 ...		
## \$ X1994	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X1995	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X1996	: int	0 0 0 0
0 0 1 0 0 0 ...		
## \$ X1997	: int	0 0 0 0
0 0 0 1 0 0 ...		
## \$ X1998	: int	0 0 0 0
0 1 0 0 1 1 ...		
## \$ X1999	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X2000	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X2001	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X2002	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X2003	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X2004	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X2005	: int	0 0 0 0
0 0 0 0 0 0 ...		
## \$ X2006	: int	0 0 0 0
0 0 0 0 0 0 ...		

## \$ X2007	: int	1	0	0	0
0 0 0 0 0 0 ...					
## \$ X2008	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ X2009	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ X2010	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ X2011	: int	0	1	0	0
0 0 0 0 0 0 ...					
## \$ X2012	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ X2013	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ X2014	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ X2015	: int	0	0	1	1
0 0 0 0 0 0 ...					
## \$ X2016	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ X2017	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ Industrials..Information.Technology	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ Financial...Insurance.Services	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ Consumer.Discretionary..Financial...Insurance.Services	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ Telecoms...Media	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ Consumer.Discretionary	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ Diversified	: int	0	0	0	0
1 1 1 1 1 1 ...					
## \$ Information.Technology	: int	1	1	1	0
0 0 0 0 0 0 ...					
## \$ Business.Services..Healthcare	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ Consumer.Discretionary..Raw.Materials...Natural.Resources	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ V10	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ Energy...Utilities..Raw.Materials...Natural.Resources	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ Business.Services	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ Raw.Materials...Natural.Resources	: int	0	0	0	0
0 0 0 0 0 0 ...					
## \$ Real.Estate	: int	0	0	0	0
0 0 0 0 0 0 ...					

```
## $ Energy...Utilities..Real.Estate      : int  0 0 0 0
0 0 0 0 0 0 ...
## $ Energy...Utilities                    : int  0 0 0 0
0 0 0 0 0 0 ...
## $ Healthcare..Information.Technology    : int  0 0 0 0
0 0 0 0 0 0 ...
## $ Industrials                          : int  0 0 0 0
0 0 0 0 0 0 ...
## $ Information.Technology..Telecoms...Media : int  0 0 0 0
0 0 0 0 0 0 ...
## $ Healthcare                           : int  0 0 0 1
0 0 0 0 0 0 ...
## $ X.1                                  : num  1.67
2.36 1.24 1.27 1.81 0.75 1.97 1.93 1.51 2.01 ...
## $ X.2                                  : num  57.3
174.6 123.6 101.5 0 ...
## $ X.3                                  : num  109.3
61.7 0 25.9 180.7 ...
## $ X.4                                  : num  113.2
101.2 59.6 86.1 88.5 ...
## $ X.5                                  : num  8.75
18.5 12.4 20.89 24.3 ...
```

Neural Network Visualization

```
n <- neuralnet(IRR ~
Fundsize+ImpactDUM+Early_StageDUM+GrowthDUM+BuyoutDUM+Fund_of_FundsDUM+Ventur
e_GeneralDUM+Early_Stage_SeedDUM+Co_InvestmentDUM+North_America_DUM+Europe_DU
M+Asia_DUM+Diversified_Multi_Regional_DUM+Americas_DUM+Africa_DUM+Middle_East
_and_Israel_DUM+Australasia_DUM,
  data = data,
  hidden = c(10,5),
  linear.output = F,
  lifesign = 'full',
  rep=1)
```

```
## hidden: 10, 5 thresh: 0.01 rep: 1/1 steps:
```

```
##      27 error: 2733314.38138 time: 0.23 secs
```

```
plot(n,
  col.hidden = 'darkgreen',
  col.hidden.synapse = 'darkgreen',
  show.weights = F,
  information = F,
  fill = 'lightblue')
```

Matrix

```
data <- as.matrix(data)
dimnames(data) <- NULL
subset <- c(1:22,25:89)
data <- data[, subset]
```

```

# Partition
set.seed(1234)
ind <- sample(2, nrow(data), replace = T, prob = c(.7, .3))
training <- data[ind==1, 3:87]
test <- data[ind==2, 3:87]
trainingtarget <- data[ind==1, 2]
testtarget <- data[ind==2, 2]

# Normalize
m <- colMeans(training)
s <- apply(training, 2, sd)
training <- scale(training, center = m, scale = s)
test <- scale(test, center = m, scale = s)

# Create Model
model <- keras_model_sequential()
model %>%
  layer_dense(units = 5, activation = 'relu', input_shape = c(85)) %>%
  layer_dense(units = 5, activation = 'relu') %>%
  layer_dense(units = 1)

# Compile
model %>% compile(loss = 'mse',
                  optimizer = 'rmsprop',
                  metrics = 'mae')

# Fit Model
mymodel <- model %>%
  fit(training,
      trainingtarget,
      epochs = 100,
      batch_size = 32,
      validation_split = 0.2)

# Evaluate
model %>% evaluate(test, testtarget)

##          loss          mae
## 370.730164    8.007389

pred <- model %>% predict(test)
mean((testtarget-pred)^2)

## [1] 370.7301

plot(testtarget, pred)
cbind(testtarget, pred)

```

##		testtarget	
##	[1,]	11.40	21.81250954
##	[2,]	8.52	14.33251667
##	[3,]	35.10	37.76774979
##	[4,]	8.50	10.37466717
##	[5,]	8.10	7.15312767
##	[6,]	2.58	0.86545110
##	[7,]	43.10	8.00468731
##	[8,]	7.00	8.31132126
##	[9,]	9.70	7.28339195
##	[10,]	13.30	10.66214561
##	[11,]	6.60	10.68280792
##	[12,]	22.20	30.07687569
##	[13,]	47.80	55.18656540
##	[14,]	4.20	4.28918171
##	[15,]	6.60	17.69876480
##	[16,]	8.20	14.36677933
##	[17,]	6.40	10.96867466
##	[18,]	27.80	15.10872173
##	[19,]	15.18	20.02437019
##	[20,]	8.24	12.59384823
##	[21,]	2.27	-0.89194179
##	[22,]	-1.50	0.41830087
##	[23,]	19.90	18.75603676
##	[24,]	44.80	50.06780624
##	[25,]	1.40	-2.38295627
##	[26,]	38.29	41.33419418
##	[27,]	14.98	18.26692009
##	[28,]	22.00	34.89545059
##	[29,]	15.06	17.83473969
##	[30,]	11.22	21.30400658
##	[31,]	12.60	21.80535507
##	[32,]	6.00	11.33144188
##	[33,]	7.00	8.51636219
##	[34,]	9.71	7.12485313
##	[35,]	15.82	19.81543159
##	[36,]	32.79	23.90426445
##	[37,]	22.10	17.70234299
##	[38,]	8.46	7.72997189
##	[39,]	11.58	14.73377991
##	[40,]	6.53	5.29386139
##	[41,]	14.24	16.34852219
##	[42,]	19.43	24.94878578
##	[43,]	18.66	15.96354008
##	[44,]	-10.40	-8.19297886
##	[45,]	-1.00	-3.57642436
##	[46,]	10.65	9.29674053
##	[47,]	18.83	19.40076637
##	[48,]	7.26	7.86275005
##	[49,]	3.28	-2.27873111

##	[50,]	11.10	2.71510053
##	[51,]	33.36	39.12221909
##	[52,]	407.69	20.12664413
##	[53,]	-3.50	-1.60580230
##	[54,]	3.31	13.92141247
##	[55,]	78.00	81.62807465
##	[56,]	4.69	3.11951518
##	[57,]	35.26	34.99899673
##	[58,]	26.30	7.47758293
##	[59,]	8.80	7.01305676
##	[60,]	9.60	15.92891216
##	[61,]	14.20	15.59327412
##	[62,]	4.80	21.80805206
##	[63,]	12.30	11.09465408
##	[64,]	5.00	2.91828179
##	[65,]	5.50	-0.17463851
##	[66,]	-5.00	-0.51066065
##	[67,]	1.10	-0.35854840
##	[68,]	17.66	17.09017754
##	[69,]	10.03	8.32894993
##	[70,]	21.01	14.16184711
##	[71,]	21.35	15.18314838
##	[72,]	11.30	17.31253052
##	[73,]	5.08	10.60041523
##	[74,]	12.20	14.38543797
##	[75,]	17.25	14.68740749
##	[76,]	9.47	7.04271317
##	[77,]	7.46	8.56176758
##	[78,]	10.62	10.21796894
##	[79,]	8.43	9.35012722
##	[80,]	7.79	6.46833420
##	[81,]	15.07	14.09963226
##	[82,]	16.85	14.05703640
##	[83,]	10.34	13.31503868
##	[84,]	-7.53	-9.62221241
##	[85,]	72.57	28.22267723
##	[86,]	54.70	29.24922371
##	[87,]	-10.10	-9.61317730
##	[88,]	9.90	8.28431511
##	[89,]	21.50	7.24546337
##	[90,]	14.10	23.51130104
##	[91,]	54.20	35.69762039
##	[92,]	19.00	15.15964031
##	[93,]	8.60	8.13622952
##	[94,]	32.40	14.06039524
##	[95,]	12.68	11.77226734
##	[96,]	-4.44	-6.63653374
##	[97,]	10.60	8.50061703
##	[98,]	2.10	7.24546337
##	[99,]	17.36	22.81046867

##	[100,]	37.40	24.56158638
##	[101,]	25.00	3.93222165
##	[102,]	20.00	28.30711174
##	[103,]	8.49	20.40613747
##	[104,]	-11.12	-1.42086196
##	[105,]	22.90	20.97992516
##	[106,]	8.90	10.18502617
##	[107,]	16.10	25.77172661
##	[108,]	2.10	2.13686275
##	[109,]	-19.94	-17.22634315
##	[110,]	22.90	23.67325211
##	[111,]	8.50	-1.60787487
##	[112,]	5.04	4.04099941
##	[113,]	-1.00	-6.18610287
##	[114,]	3.49	0.05951929
##	[115,]	8.00	15.03998947
##	[116,]	25.50	38.82536316
##	[117,]	11.50	16.02194977
##	[118,]	5.40	12.48499393
##	[119,]	30.30	26.16030312
##	[120,]	17.45	22.29220390
##	[121,]	6.23	4.70506001
##	[122,]	29.00	74.56453705
##	[123,]	12.28	11.81209946
##	[124,]	11.00	11.94319534
##	[125,]	22.40	22.83554649
##	[126,]	19.92	25.17444420
##	[127,]	39.90	61.07783890
##	[128,]	16.44	22.60025597
##	[129,]	71.71	0.57850194
##	[130,]	13.80	14.34153271
##	[131,]	10.30	7.99119949
##	[132,]	14.20	7.24546337
##	[133,]	41.40	30.73504829
##	[134,]	10.67	11.75578022
##	[135,]	11.31	11.80186939
##	[136,]	9.80	8.95155239
##	[137,]	-2.90	9.25493145
##	[138,]	-1.40	9.91098213
##	[139,]	-5.90	9.87466240
##	[140,]	13.00	13.08138847
##	[141,]	60.70	41.18294525
##	[142,]	43.10	41.43938065
##	[143,]	9.66	14.38861942
##	[144,]	10.70	6.83238029
##	[145,]	8.50	10.28310966
##	[146,]	38.77	22.39974785
##	[147,]	7.00	17.71737862
##	[148,]	37.00	-6.28657818
##	[149,]	21.23	17.20375252

##	[150,]	3.64	4.10752964
##	[151,]	-1.81	-3.42574668
##	[152,]	9.20	1.57371974
##	[153,]	7.70	10.28559971
##	[154,]	6.72	6.59881783
##	[155,]	7.36	9.69042873
##	[156,]	17.31	18.54080200
##	[157,]	48.60	29.47311592
##	[158,]	7.82	8.16983414
##	[159,]	20.31	23.67917061
##	[160,]	-0.19	12.85825253
##	[161,]	18.50	15.19189835
##	[162,]	-0.74	4.80412769
##	[163,]	76.00	46.64502716
##	[164,]	17.50	15.47031403
##	[165,]	23.41	36.65074158
##	[166,]	-6.57	-2.60932732
##	[167,]	-4.41	2.01937079
##	[168,]	-23.77	-7.55024624
##	[169,]	29.00	44.23102188
##	[170,]	-12.60	-10.08459663
##	[171,]	26.75	65.56845093
##	[172,]	3.72	2.19203162
##	[173,]	50.00	31.52216911
##	[174,]	11.03	9.03335953
##	[175,]	12.93	9.98982620
##	[176,]	-16.92	4.48712063
##	[177,]	13.21	12.27488327
##	[178,]	5.20	6.60717583
##	[179,]	23.70	34.71301270
##	[180,]	29.54	42.06895065
##	[181,]	-3.20	-6.24832344
##	[182,]	-33.29	-21.49570847
##	[183,]	45.00	19.42311668
##	[184,]	-7.01	-9.37434006
##	[185,]	30.74	30.28757668
##	[186,]	4.70	-1.53512740
##	[187,]	6.61	4.06253910
##	[188,]	4.67	3.60125351
##	[189,]	-8.48	-9.92573261
##	[190,]	9.90	9.23874569
##	[191,]	19.90	17.36587334
##	[192,]	3.19	2.52018094
##	[193,]	51.60	72.26383209
##	[194,]	47.70	39.36867142
##	[195,]	49.00	17.85471153
##	[196,]	5.00	2.68157196
##	[197,]	12.00	24.73956490
##	[198,]	21.53	14.61072445
##	[199,]	33.03	26.13791084

##	[200,]	13.00	19.71455002
##	[201,]	-0.17	3.60248303
##	[202,]	15.44	17.16245461
##	[203,]	20.83	28.07472801
##	[204,]	17.88	21.23242760
##	[205,]	14.54	21.83539391
##	[206,]	12.69	20.32432556
##	[207,]	3.30	13.65684986
##	[208,]	-7.60	-8.70805550
##	[209,]	-5.30	-6.23725605
##	[210,]	0.57	1.45874333
##	[211,]	10.30	9.98339844
##	[212,]	21.60	4.48467159
##	[213,]	7.08	12.46987343
##	[214,]	18.00	16.95798302
##	[215,]	15.10	34.81227875
##	[216,]	12.00	20.75716209
##	[217,]	9.00	14.45934105
##	[218,]	21.20	42.26018143
##	[219,]	16.90	19.76726151
##	[220,]	15.42	14.38583088
##	[221,]	19.13	7.24546337
##	[222,]	-0.04	7.24546337
##	[223,]	3.91	7.24546337
##	[224,]	-15.65	-12.17261982
##	[225,]	31.70	23.80130386
##	[226,]	8.89	12.93705559
##	[227,]	13.00	15.31047344
##	[228,]	-1.60	-5.02567291
##	[229,]	13.20	27.40481377
##	[230,]	4.80	1.93087649
##	[231,]	17.30	24.57600975
##	[232,]	11.00	12.79523563
##	[233,]	31.30	31.20233536
##	[234,]	17.07	23.78563881
##	[235,]	14.66	17.08064842
##	[236,]	20.37	16.56856346
##	[237,]	15.90	18.33601189
##	[238,]	7.40	18.15384102
##	[239,]	11.79	15.71401310
##	[240,]	19.10	18.48846054
##	[241,]	33.41	30.88700294
##	[242,]	22.98	35.22316360
##	[243,]	-39.51	30.87521553
##	[244,]	14.47	15.96836948
##	[245,]	17.66	6.21023369
##	[246,]	11.00	6.03864002
##	[247,]	18.24	19.11269569
##	[248,]	11.80	13.58892441
##	[249,]	15.66	7.49508190

##	[250,]	9.20	-0.58783507
##	[251,]	6.10	1.61704814
##	[252,]	7.00	1.83248734
##	[253,]	9.20	3.94614553
##	[254,]	37.30	26.18210411
##	[255,]	37.02	29.50744057
##	[256,]	8.64	7.24546337
##	[257,]	9.50	11.64188957
##	[258,]	6.50	9.77728558
##	[259,]	13.12	29.41328049
##	[260,]	20.17	20.91632652
##	[261,]	9.70	16.14814758
##	[262,]	9.30	10.41214466
##	[263,]	28.00	29.89360619
##	[264,]	-2.10	6.12079906
##	[265,]	-11.67	4.61800098
##	[266,]	8.47	8.06494141
##	[267,]	0.25	-3.09672236
##	[268,]	13.50	13.07236576
##	[269,]	9.50	11.50689411
##	[270,]	6.00	5.44231415
##	[271,]	-20.10	2.08645368
##	[272,]	31.00	49.64696121
##	[273,]	23.93	16.72912979
##	[274,]	26.24	30.60122871
##	[275,]	9.39	19.40456963
##	[276,]	11.60	21.21622658
##	[277,]	-5.92	-12.27415180
##	[278,]	10.94	17.38187027
##	[279,]	79.00	90.13119507
##	[280,]	17.10	16.58699799
##	[281,]	45.00	35.81128693
##	[282,]	31.72	85.30179596
##	[283,]	6.00	6.35397530
##	[284,]	5.09	2.94913530
##	[285,]	24.50	4.53587914
##	[286,]	53.54	32.29474258
##	[287,]	14.97	1.31515622
##	[288,]	11.90	22.94075584
##	[289,]	4.20	-1.70276046
##	[290,]	3.93	4.89749050
##	[291,]	0.90	5.74468231
##	[292,]	10.20	-10.73120499
##	[293,]	24.90	40.07940292
##	[294,]	11.10	14.45762634
##	[295,]	-5.00	-3.72161317
##	[296,]	12.03	20.01223564
##	[297,]	25.07	26.73188591
##	[298,]	46.89	38.15015030
##	[299,]	26.60	15.83036518

##	[300,]	53.58	32.14797211
##	[301,]	20.36	20.71500778
##	[302,]	8.58	11.16118336
##	[303,]	4.56	11.33570671
##	[304,]	8.21	12.59666157
##	[305,]	8.01	5.04034328
##	[306,]	10.01	12.37733173
##	[307,]	13.60	23.03931427
##	[308,]	39.00	59.19236755
##	[309,]	27.03	21.24962234
##	[310,]	0.00	7.05268002
##	[311,]	16.32	19.94569969
##	[312,]	12.00	9.45079803
##	[313,]	0.57	4.37047100
##	[314,]	14.72	14.14803219
##	[315,]	36.93	39.30580902
##	[316,]	26.90	11.52276516
##	[317,]	2.70	2.95628357
##	[318,]	11.70	17.40515709
##	[319,]	-10.54	-7.91663837
##	[320,]	1.40	66.32494354
##	[321,]	13.20	10.13184357
##	[322,]	22.90	33.39427948
##	[323,]	19.06	28.07678795
##	[324,]	-44.60	9.19489002
##	[325,]	3.50	2.56848288
##	[326,]	9.30	1.21945214
##	[327,]	10.10	11.27919483
##	[328,]	-1.99	-5.93692875
##	[329,]	13.30	33.60124969
##	[330,]	18.40	15.97180748
##	[331,]	8.70	4.77858019
##	[332,]	13.20	9.86752796
##	[333,]	18.00	4.66859436
##	[334,]	16.20	12.82413578
##	[335,]	4.00	0.01666164
##	[336,]	15.14	42.41099930
##	[337,]	55.70	35.86455154
##	[338,]	63.00	68.68421936
##	[339,]	19.90	11.81199074
##	[340,]	8.00	17.02290154
##	[341,]	6.82	7.44632149
##	[342,]	11.47	14.94479275
##	[343,]	0.49	7.85117435
##	[344,]	48.58	42.81224442
##	[345,]	-2.80	8.27546406
##	[346,]	-0.40	4.94622707
##	[347,]	29.00	9.26205540
##	[348,]	17.10	20.01258469
##	[349,]	12.40	13.83912468

##	[350,]	4.00	-1.61816764
##	[351,]	20.00	-8.00523090
##	[352,]	19.00	-9.65050793
##	[353,]	28.00	2.84151244
##	[354,]	13.60	9.59874821
##	[355,]	5.00	-0.29798293
##	[356,]	20.87	17.72139168
##	[357,]	26.10	31.11139870
##	[358,]	24.90	29.82939911
##	[359,]	14.50	10.78423023
##	[360,]	12.90	7.24546337
##	[361,]	0.20	4.82777119
##	[362,]	-23.59	-10.13063526
##	[363,]	1.90	0.59327054
##	[364,]	14.40	9.53489685
##	[365,]	10.70	17.44814873
##	[366,]	15.38	20.03379631
##	[367,]	6.70	16.94095802
##	[368,]	-25.60	-12.05165863
##	[369,]	25.80	21.19322777
##	[370,]	28.80	44.90708542
##	[371,]	52.30	23.61756134
##	[372,]	-14.30	-11.80692577
##	[373,]	7.99	6.20533466
##	[374,]	14.01	16.48015022
##	[375,]	19.35	15.51123810
##	[376,]	14.71	9.72382069
##	[377,]	41.17	41.44359207
##	[378,]	-6.20	-0.33519244
##	[379,]	32.32	26.39830971
##	[380,]	0.97	-2.41967034
##	[381,]	27.30	33.03765488
##	[382,]	1.67	-2.14280939
##	[383,]	0.71	0.73807740
##	[384,]	8.40	7.24546337
##	[385,]	9.10	11.36548042
##	[386,]	13.60	17.23970795
##	[387,]	17.18	12.88463020
##	[388,]	-6.93	-5.03430271
##	[389,]	65.00	140.70405579
##	[390,]	22.10	7.73154449
##	[391,]	24.90	39.94169998
##	[392,]	16.80	17.94484329
##	[393,]	11.51	17.05969810
##	[394,]	7.37	36.27182007
##	[395,]	33.72	30.98012543
##	[396,]	4.49	2.63142848
##	[397,]	14.96	9.37171650
##	[398,]	29.83	35.93563461
##	[399,]	33.58	32.14325714

##	[400,]	12.10	12.46260929
##	[401,]	12.00	10.69669628
##	[402,]	8.20	8.40838718
##	[403,]	13.90	14.49272919
##	[404,]	8.71	9.86602211
##	[405,]	192.30	80.49335480
##	[406,]	13.30	7.24546337
##	[407,]	12.40	11.65686321
##	[408,]	14.13	15.94144726
##	[409,]	12.78	9.69326782
##	[410,]	8.87	9.62080956
##	[411,]	5.54	9.65901661
##	[412,]	-2.73	8.10746861
##	[413,]	6.45	7.64243889
##	[414,]	9.59	8.70900345
##	[415,]	10.83	14.03098583
##	[416,]	6.61	6.89315987
##	[417,]	13.17	8.81721497
##	[418,]	19.61	22.95207977
##	[419,]	17.90	14.76875401
##	[420,]	1.23	0.83012509
##	[421,]	11.30	22.63546944
##	[422,]	6.70	7.96856976
##	[423,]	28.50	19.01567268
##	[424,]	20.21	13.88200283
##	[425,]	8.52	11.61715889
##	[426,]	9.60	16.06567001
##	[427,]	14.30	17.64402580
##	[428,]	3.90	7.64177513
##	[429,]	-1.90	-11.06603718
##	[430,]	21.77	23.12443924
##	[431,]	28.92	27.87896538
##	[432,]	12.60	13.60377789
##	[433,]	46.26	17.77939987
##	[434,]	12.56	21.40150261
##	[435,]	0.60	-2.81236863
##	[436,]	-12.20	-9.85241795
##	[437,]	4.71	1.63379550
##	[438,]	-7.40	-8.05955219
##	[439,]	-5.50	1.88976216
##	[440,]	6.15	19.20012093
##	[441,]	37.50	29.48164940
##	[442,]	13.70	19.32152557
##	[443,]	15.10	5.53286457
##	[444,]	8.39	7.68514538
##	[445,]	15.02	14.33059788
##	[446,]	16.63	9.70299053
##	[447,]	10.49	7.57825184
##	[448,]	15.26	11.19043446
##	[449,]	16.10	29.32142258

##	[450,]	-3.30	-0.52437186
##	[451,]	65.38	45.43828964
##	[452,]	14.00	5.67724228
##	[453,]	30.80	22.08799553
##	[454,]	-7.10	-4.82553673
##	[455,]	-5.70	-5.36344433
##	[456,]	6.01	7.25484562
##	[457,]	20.65	15.61324787
##	[458,]	5.23	4.99299431
##	[459,]	21.40	17.92277336
##	[460,]	5.83	11.25129795
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##	[462,]	-13.99	5.92630291
##	[463,]	7.07	5.20527267
##	[464,]	18.20	13.67484951
##	[465,]	19.60	22.34045982
##	[466,]	3.09	5.89492607
##	[467,]	12.53	23.40176010
##	[468,]	17.86	19.34176064
##	[469,]	4.03	4.09296227
##	[470,]	-3.95	-7.13776112
##	[471,]	55.40	27.08316994
##	[472,]	-22.70	-5.70074654
##	[473,]	4.34	9.25537300
##	[474,]	23.70	20.68933105
##	[475,]	31.50	26.06521416
##	[476,]	23.83	26.37083435
##	[477,]	31.30	23.17580032
##	[478,]	11.10	21.59416771
##	[479,]	2.60	12.41655064
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##	[481,]	1.99	4.30363417
##	[482,]	11.00	15.95882511
##	[483,]	20.70	22.64070320
##	[484,]	10.80	8.36502743
##	[485,]	37.67	17.95267296
##	[486,]	26.91	19.62290764
##	[487,]	4.57	3.01946664
##	[488,]	22.00	19.05769157
##	[489,]	15.30	13.63410378
##	[490,]	25.50	17.95429420
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##	[492,]	7.02	5.55997181
##	[493,]	5.17	16.29219627
##	[494,]	5.10	16.27585602
##	[495,]	5.38	6.13750744
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##	[500,]	15.10	14.56284523
##	[501,]	4.20	6.28936768
##	[502,]	4.10	8.47661781
##	[503,]	8.62	9.79161644
##	[504,]	28.20	53.05860138
##	[505,]	9.22	10.26358032
##	[506,]	15.30	20.36579132
##	[507,]	10.00	13.03860569
##	[508,]	8.90	13.58718395
##	[509,]	16.65	30.84181023
##	[510,]	13.70	16.20105934
##	[511,]	26.00	27.07001114
##	[512,]	46.30	17.64151955
##	[513,]	1.10	-1.92867327
##	[514,]	14.50	7.48931026
##	[515,]	11.82	11.27922153
##	[516,]	13.06	22.57203484
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##	[520,]	7.60	10.28281498
##	[521,]	22.00	9.46515179
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##	[523,]	9.90	13.24177647
##	[524,]	11.73	9.82120037
##	[525,]	-4.82	-9.36041355
##	[526,]	13.70	10.78821278
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##	[531,]	-7.30	-1.95258784
##	[532,]	4.90	10.41142273
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##	[536,]	28.00	35.71376419
##	[537,]	20.00	24.45642281
##	[538,]	23.40	33.01642990
##	[539,]	12.00	11.67335224
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##	[542,]	6.50	6.24391365
##	[543,]	17.50	8.12485504
##	[544,]	-9.20	7.51047325
##	[545,]	3.90	2.77616334
##	[546,]	3.51	1.07098174
##	[547,]	8.13	13.30206203
##	[548,]	0.30	-5.32031345
##	[549,]	6.20	7.59977818

##	[550,]	18.50	16.89950371
##	[551,]	13.54	12.00522137
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##	[553,]	7.95	21.78184700
##	[554,]	2.02	10.29727173
##	[555,]	11.60	16.91627693
##	[556,]	10.30	11.37306309
##	[557,]	-4.50	-11.59324074
##	[558,]	12.77	9.53541183
##	[559,]	8.71	8.01515579
##	[560,]	213.00	133.22883606
##	[561,]	1.70	-0.80014968
##	[562,]	-2.40	6.00701618
##	[563,]	2.30	10.50415134
##	[564,]	6.40	4.43041897
##	[565,]	41.70	33.58864212
##	[566,]	5.81	14.72084522
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##	[569,]	18.27	7.63101006
##	[570,]	-21.60	-9.44672489
##	[571,]	7.70	7.66464806
##	[572,]	4.20	9.42681789
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##	[574,]	7.20	11.64508533
##	[575,]	35.63	6.95653439
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##	[577,]	4.46	7.08161354
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##	[579,]	42.80	44.97701263
##	[580,]	9.16	9.98768044
##	[581,]	6.36	12.06051731
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##	[583,]	10.91	8.19944191
##	[584,]	28.80	22.23749733
##	[585,]	14.50	10.03744698
##	[586,]	12.20	12.30195713
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##	[588,]	20.89	19.47961998
##	[589,]	20.80	18.18720055
##	[590,]	19.95	13.31090927
##	[591,]	43.60	35.44508743
##	[592,]	19.00	38.86419296
##	[593,]	14.10	19.60589600
##	[594,]	13.00	16.22859192
##	[595,]	7.91	10.13696480
##	[596,]	18.14	25.94032097
##	[597,]	12.19	9.60439873
##	[598,]	22.00	22.43177223
##	[599,]	4.78	-2.08655334

##	[600,]	-1.70	14.93213749
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##	[603,]	16.00	12.89898491
##	[604,]	-1.90	4.01659393
##	[605,]	71.50	24.03148460
##	[606,]	11.90	20.92984581
##	[607,]	20.57	21.20278931
##	[608,]	15.80	21.25690842
##	[609,]	37.40	39.27898026
##	[610,]	79.80	43.36641693
##	[611,]	9.70	-10.30600548
##	[612,]	30.60	-7.83017254
##	[613,]	5.60	13.12554359
##	[614,]	16.67	19.62458611
##	[615,]	3.30	14.37935925
##	[616,]	11.10	9.76539421
##	[617,]	0.90	0.09589505
##	[618,]	14.10	15.41729259
##	[619,]	17.27	22.30243111
##	[620,]	8.30	8.37528038
##	[621,]	32.10	9.30392551
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##	[623,]	35.10	35.60441971
##	[624,]	13.75	11.97504711
##	[625,]	7.70	11.82328892
##	[626,]	6.19	13.38053703
##	[627,]	1.92	0.16739726
##	[628,]	19.49	15.68244839
##	[629,]	1.55	2.60209298
##	[630,]	45.51	30.44280434
##	[631,]	0.97	-0.09938025
##	[632,]	27.17	24.29259300
##	[633,]	25.70	30.42329597
##	[634,]	20.80	34.52814102
##	[635,]	21.62	28.17562675
##	[636,]	21.81	26.20385933
##	[637,]	13.90	20.66372299
##	[638,]	8.40	7.23946571
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##	[640,]	24.35	21.94382477
##	[641,]	40.29	41.16938400
##	[642,]	2.50	8.70802116
##	[643,]	0.38	14.38293934
##	[644,]	20.15	12.75501537
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##	[646,]	19.00	18.75657845
##	[647,]	12.20	19.45042992
##	[648,]	48.93	33.54363251
##	[649,]	-0.80	0.96816421

##	[650,]	-4.50	-5.50364780
##	[651,]	20.81	18.13415527
##	[652,]	18.70	11.32852173
##	[653,]	10.00	9.88524151
##	[654,]	31.40	31.22614861
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##	[657,]	15.05	4.55174446
##	[658,]	3.33	5.93791676
##	[659,]	13.90	16.96384621
##	[660,]	34.50	24.13879013
##	[661,]	21.01	16.80722427
##	[662,]	4.88	7.84417343
##	[663,]	35.19	34.97607040
##	[664,]	20.60	12.30601978
##	[665,]	2.00	5.35256004
##	[666,]	11.00	13.26350498
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##	[668,]	2.86	1.31297517
##	[669,]	6.30	3.15459371
##	[670,]	13.52	18.51065826
##	[671,]	19.52	17.68234253
##	[672,]	19.08	22.59110641
##	[673,]	28.00	41.60355759
##	[674,]	1.93	0.69034696
##	[675,]	-11.02	32.42308426
##	[676,]	10.21	18.14791489
##	[677,]	14.30	15.72603035
##	[678,]	16.98	17.77236938
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##	[682,]	8.47	10.61065197
##	[683,]	11.90	9.03143120
##	[684,]	2.71	0.06189823
##	[685,]	1.80	12.48282337
##	[686,]	13.80	16.13940811
##	[687,]	15.25	16.31909943
##	[688,]	3.62	7.14767170
##	[689,]	8.86	8.28751087
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##	[691,]	10.19	7.24546337
##	[692,]	6.88	5.89063454
##	[693,]	10.35	7.92708874
##	[694,]	16.50	9.99288082
##	[695,]	19.15	11.57919216
##	[696,]	-9.50	-1.46418452
##	[697,]	17.30	14.18998814
##	[698,]	22.04	19.92634392
##	[699,]	1.08	-4.20233917

##	[700,]	11.73	8.96606159
##	[701,]	-4.50	-2.60857201
##	[702,]	17.00	16.91273880
##	[703,]	0.10	6.45395947
##	[704,]	6.40	9.47412300
##	[705,]	12.30	27.01290131
##	[706,]	8.62	19.99817467
##	[707,]	13.79	15.71961880
##	[708,]	27.84	33.87429810
##	[709,]	15.00	-7.53032589
##	[710,]	-10.60	-8.82240868
##	[711,]	-0.46	16.42860413
##	[712,]	-1.53	-4.74759579
##	[713,]	13.30	10.76143742
##	[714,]	19.60	28.49933052
##	[715,]	12.06	21.20728683
##	[716,]	13.80	22.57266998
##	[717,]	35.70	28.57540321
##	[718,]	-3.86	-9.74117756
##	[719,]	-14.20	-0.66798759
##	[720,]	70.00	47.49531174
##	[721,]	5.90	2.24865818
##	[722,]	25.30	31.74087906
##	[723,]	13.97	13.88467884
##	[724,]	5.19	6.73671246
##	[725,]	13.60	12.42427158
##	[726,]	16.00	26.79328728
##	[727,]	27.00	-3.33003974
##	[728,]	-9.38	-13.70053291
##	[729,]	12.70	43.07558823
##	[730,]	68.50	-7.26646328
##	[731,]	-0.90	-1.42536902
##	[732,]	8.20	-5.35432053
##	[733,]	6.30	-8.46490479
##	[734,]	38.79	29.14604759
##	[735,]	12.50	15.13361073
##	[736,]	10.50	4.89276791
##	[737,]	13.40	16.81363487
##	[738,]	5.28	8.81983948
##	[739,]	9.87	19.50168800
##	[740,]	12.13	16.75453758
##	[741,]	1.97	16.98189735
##	[742,]	10.14	4.39064503
##	[743,]	8.53	5.39449310
##	[744,]	26.00	28.05087090
##	[745,]	15.00	19.06419563
##	[746,]	13.18	11.64753056
##	[747,]	29.80	15.18526745
##	[748,]	6.13	4.67400980
##	[749,]	13.17	14.60819054

##	[750,]	17.81	16.22499466
##	[751,]	33.50	23.14069748
##	[752,]	-1.80	11.84022236
##	[753,]	3.17	0.10799336
##	[754,]	0.19	-5.04734898
##	[755,]	25.00	14.92749786
##	[756,]	10.00	25.64627266
##	[757,]	17.00	16.17949677
##	[758,]	6.40	6.92654133
##	[759,]	18.97	11.78885937
##	[760,]	16.30	29.24522781
##	[761,]	12.60	16.28806877
##	[762,]	15.47	17.50964165
##	[763,]	10.91	11.05389118
##	[764,]	2.81	1.98201966
##	[765,]	6.70	8.65963173
##	[766,]	26.20	17.85389137
##	[767,]	17.20	12.93158436
##	[768,]	1.10	6.94231701
##	[769,]	10.82	11.43164539
##	[770,]	48.97	35.11262894
##	[771,]	29.66	33.40731430
##	[772,]	20.50	20.17258644
##	[773,]	24.60	16.67935562
##	[774,]	35.30	30.77805138
##	[775,]	10.60	10.37411976
##	[776,]	6.80	15.73747158
##	[777,]	5.63	4.28940678
##	[778,]	7.00	16.39875031
##	[779,]	8.20	9.32748318
##	[780,]	26.00	44.49753952
##	[781,]	10.00	12.14984417
##	[782,]	11.31	8.33358574
##	[783,]	20.19	46.91420364
##	[784,]	1.48	2.46275973
##	[785,]	-2.55	-2.64180636
##	[786,]	25.90	24.80277824
##	[787,]	8.00	18.53131485
##	[788,]	8.40	13.41341877
##	[789,]	11.18	4.96674538
##	[790,]	5.01	1.47624850
##	[791,]	6.60	4.79222393
##	[792,]	16.75	18.18303490
##	[793,]	-13.40	-5.23490334
##	[794,]	48.00	21.73931313
##	[795,]	19.80	19.95627403
##	[796,]	16.00	17.91071320
##	[797,]	-6.89	-1.87941146
##	[798,]	3.30	11.21240902
##	[799,]	20.00	31.40089989

##	[800,]	5.29	3.88769937
##	[801,]	-3.90	4.46285343
##	[802,]	24.70	18.51079750
##	[803,]	11.29	23.17206573
##	[804,]	11.95	15.41613960
##	[805,]	2.80	0.36677456
##	[806,]	16.16	10.33911324
##	[807,]	-9.90	-5.30742455
##	[808,]	-2.70	-3.50419497
##	[809,]	-11.51	-9.08613110
##	[810,]	2.10	2.81206632
##	[811,]	24.50	39.90591049
##	[812,]	6.20	27.52121353
##	[813,]	4.00	1.60692000
##	[814,]	16.70	12.52600956
##	[815,]	10.50	12.50288105
##	[816,]	24.70	16.32896423
##	[817,]	11.00	22.82678986
##	[818,]	9.96	11.36222172
##	[819,]	26.30	16.53773308
##	[820,]	-5.68	-4.91028214
##	[821,]	11.12	12.10449123
##	[822,]	9.74	9.84167099
##	[823,]	20.23	14.41943932
##	[824,]	23.00	27.35390663
##	[825,]	15.90	30.14239120
##	[826,]	6.63	1.85950661
##	[827,]	4.71	7.68838406
##	[828,]	-32.99	-11.33632183
##	[829,]	54.00	70.61550903
##	[830,]	17.00	16.88900185
##	[831,]	17.36	5.95643806
##	[832,]	28.30	25.71747208
##	[833,]	9.60	9.96333694
##	[834,]	16.90	8.53004837
##	[835,]	0.20	4.94450188
##	[836,]	4.60	3.10061741
##	[837,]	35.50	135.47396851
##	[838,]	39.20	14.60128689
##	[839,]	28.90	130.28698730
##	[840,]	17.60	18.50885201
##	[841,]	40.00	41.09684753
##	[842,]	56.30	63.31379700
##	[843,]	14.53	9.24497318
##	[844,]	7.85	6.76166821
##	[845,]	15.88	22.81753540
##	[846,]	14.40	9.70594311
##	[847,]	18.04	29.12948036
##	[848,]	9.30	-3.42141318
##	[849,]	12.50	14.14416981

##	[850,]	5.70	4.86290693
##	[851,]	14.80	8.37515831
##	[852,]	0.10	-4.56070232
##	[853,]	7.30	9.91760349
##	[854,]	11.00	14.11161518
##	[855,]	20.00	13.92730331
##	[856,]	-34.00	-16.62726974
##	[857,]	-49.85	-15.62917805
##	[858,]	-5.03	21.11436844
##	[859,]	11.00	9.81907940
##	[860,]	35.70	45.20048904
##	[861,]	42.09	40.59712601
##	[862,]	0.02	-6.08819389
##	[863,]	9.11	-1.02083802
##	[864,]	16.75	10.87149429
##	[865,]	-6.45	-8.49338818
##	[866,]	20.20	15.39803982
##	[867,]	3.90	1.70770001
##	[868,]	-0.86	-0.43691897
##	[869,]	6.00	-0.08748698
##	[870,]	10.80	12.41481209
##	[871,]	76.90	31.53483009
##	[872,]	19.75	23.39029884
##	[873,]	26.90	22.73916054
##	[874,]	-2.97	5.86111927
##	[875,]	12.90	7.06172657
##	[876,]	5.50	9.29299641
##	[877,]	31.00	21.64940262
##	[878,]	-0.14	1.51371503
##	[879,]	7.35	1.65414429
##	[880,]	19.10	26.70766449
##	[881,]	-3.08	-1.37960315
##	[882,]	4.72	8.06680298
##	[883,]	23.30	12.66967869
##	[884,]	12.14	10.15492725
##	[885,]	0.77	-8.90923309
##	[886,]	-3.70	-17.63669205
##	[887,]	30.00	36.50197983
##	[888,]	19.00	13.20537186
##	[889,]	0.66	1.93218350
##	[890,]	5.63	3.02064896
##	[891,]	4.26	3.36488605
##	[892,]	12.00	18.40083504
##	[893,]	6.84	9.78613853
##	[894,]	30.50	41.38577271
##	[895,]	8.55	16.31395721
##	[896,]	11.00	16.00467491
##	[897,]	18.03	18.53759956
##	[898,]	33.76	23.19947624
##	[899,]	8.63	6.09280872

##	[900,]	13.70	12.95723820
##	[901,]	11.62	14.15581036
##	[902,]	21.10	25.68878937
##	[903,]	0.40	-6.69242191
##	[904,]	28.80	7.24546337
##	[905,]	24.00	20.13321686
##	[906,]	26.40	13.45120335
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##	[909,]	28.40	14.02540493
##	[910,]	22.13	15.93555069
##	[911,]	-5.50	0.94323540
##	[912,]	14.00	23.18796539
##	[913,]	38.00	39.79550552
##	[914,]	10.95	13.02345371
##	[915,]	14.10	16.86447906
##	[916,]	13.40	18.82089043
##	[917,]	21.78	19.19314384
##	[918,]	8.20	12.27819920
##	[919,]	13.80	18.74850082
##	[920,]	-9.32	-1.09543228
##	[921,]	25.50	40.81812668
##	[922,]	14.40	12.64011955
##	[923,]	19.98	25.17521858
##	[924,]	10.54	10.45415878
##	[925,]	16.30	23.13179779
##	[926,]	1.70	-5.84421730
##	[927,]	27.70	54.97959518
##	[928,]	-4.88	-7.54043674
##	[929,]	8.77	19.35742378
##	[930,]	19.70	8.54446983
##	[931,]	28.08	30.89187050
##	[932,]	22.01	43.25259018
##	[933,]	14.01	19.45516396
##	[934,]	24.10	48.28248978
##	[935,]	8.30	16.69277954
##	[936,]	3.00	4.11865711
##	[937,]	30.50	16.17136383
##	[938,]	14.27	12.10304546
##	[939,]	31.22	27.17902946
##	[940,]	-0.20	-3.98191142
##	[941,]	22.59	30.15459251
##	[942,]	2.84	32.90670776
##	[943,]	14.00	17.37534714
##	[944,]	74.40	56.57815170
##	[945,]	514.33	170.51394653
##	[946,]	48.30	58.31292343
##	[947,]	-4.60	-6.13479710
##	[948,]	10.64	9.95860672
##	[949,]	7.25	4.93008709

##	[950,]	-3.12	-6.57602787
##	[951,]	8.24	8.76534176
##	[952,]	-0.60	2.47267365
##	[953,]	8.98	17.74950027
##	[954,]	42.15	13.01942348
##	[955,]	10.65	18.10062790
##	[956,]	-2.40	1.76981091
##	[957,]	13.00	1.14721394
##	[958,]	-7.00	-6.51696587
##	[959,]	3.43	26.78011513
##	[960,]	-14.10	-3.95705295
##	[961,]	22.30	23.63832855
##	[962,]	22.30	31.05938530
##	[963,]	8.14	8.07491112
##	[964,]	13.14	13.55212021
##	[965,]	1.30	-0.23710108
##	[966,]	12.00	16.49653053
##	[967,]	60.90	56.97885513
##	[968,]	40.90	60.03946304
##	[969,]	-9.20	-11.66050720
##	[970,]	17.80	23.53983879
##	[971,]	31.10	38.32484818
##	[972,]	-8.04	11.26425362
##	[973,]	8.40	5.01015329
##	[974,]	13.20	18.80656242
##	[975,]	15.80	12.24468517
##	[976,]	17.40	14.66247272
##	[977,]	13.40	13.96484089
##	[978,]	13.80	13.30208683
##	[979,]	7.70	6.75774479
##	[980,]	20.85	22.69836998
##	[981,]	40.97	31.07886696
##	[982,]	15.66	22.85485649
##	[983,]	23.46	25.48056412
##	[984,]	19.55	20.77463722
##	[985,]	-10.10	-10.13772106
##	[986,]	7.30	16.90746117
##	[987,]	34.40	14.20713615
##	[988,]	15.00	20.80730438
##	[989,]	14.33	12.89232540
##	[990,]	31.60	25.59225655
##	[991,]	38.05	26.34276390
##	[992,]	-55.53	7.74913502
##	[993,]	5.20	15.78224087
##	[994,]	20.00	33.89472961
##	[995,]	16.93	17.81896210
##	[996,]	22.05	17.31887436
##	[997,]	17.62	-12.93536663
##	[998,]	10.60	18.29260063
##	[999,]	17.00	21.56448364

## [1000,]	40.39	31.44251633
## [1001,]	7.30	16.34537125
## [1002,]	2.00	0.50374627
## [1003,]	17.00	16.97704315
## [1004,]	3.80	8.93144035
## [1005,]	15.16	14.17478180
## [1006,]	4.03	16.05449104
## [1007,]	31.22	24.67245674
## [1008,]	65.50	88.43875122
## [1009,]	30.61	12.85343552
## [1010,]	-2.47	-5.47140884
## [1011,]	18.90	14.78997231
## [1012,]	12.30	12.59017181
## [1013,]	8.60	7.08786392
## [1014,]	7.40	11.39906502
## [1015,]	14.30	17.54541397
## [1016,]	2.40	10.18569088
## [1017,]	12.80	10.74186325
## [1018,]	22.20	21.99319649
## [1019,]	12.60	12.25588322
## [1020,]	4.16	3.25925636
## [1021,]	21.07	27.38647652
## [1022,]	40.05	25.86875725
## [1023,]	34.39	31.43276405
## [1024,]	17.34	19.63978386
## [1025,]	11.55	14.75823116
## [1026,]	1.90	-2.21264958
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## [1028,]	18.30	10.94894695
## [1029,]	31.03	48.40244675
## [1030,]	-10.38	14.94463253
## [1031,]	8.20	9.42431450
## [1032,]	15.40	12.65687275
## [1033,]	30.00	21.04069901
## [1034,]	15.60	22.51818275
## [1035,]	24.60	24.78090096
## [1036,]	24.12	32.43604279
## [1037,]	0.00	6.07417488
## [1038,]	8.64	20.51467133
## [1039,]	5.94	12.43741798
## [1040,]	-8.10	-5.01729202
## [1041,]	-15.95	-13.58560944
## [1042,]	16.00	34.35684586
## [1043,]	41.00	109.25344849
## [1044,]	24.09	22.47243309
## [1045,]	19.98	42.67672348
## [1046,]	8.22	15.06364632
## [1047,]	25.44	11.00947094
## [1048,]	8.16	9.97755527
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## [1050,]	13.10	8.99636078
## [1051,]	18.00	16.40861320
## [1052,]	6.80	8.36717892
## [1053,]	6.22	4.97047234
## [1054,]	10.40	8.61206627
## [1055,]	11.80	11.17774487
## [1056,]	15.60	13.34585857
## [1057,]	-2.94	-0.84296012
## [1058,]	8.60	-3.40117002
## [1059,]	-18.00	9.04983997
## [1060,]	-6.00	-7.86007977
## [1061,]	16.06	20.92068863
## [1062,]	24.41	20.99666786
## [1063,]	58.80	29.30958748
## [1064,]	1.60	12.50694180
## [1065,]	-3.30	-9.07856750
## [1066,]	10.74	14.71346474
## [1067,]	3.30	3.27052951
## [1068,]	43.10	16.26629448
## [1069,]	55.33	17.39153099
## [1070,]	3.48	1.66566634
## [1071,]	13.10	10.32094383
## [1072,]	6.12	8.53776073
## [1073,]	39.80	-8.88347149
## [1074,]	8.20	2.80542874
## [1075,]	27.10	30.36317825
## [1076,]	40.32	24.10042381
## [1077,]	29.20	32.01295471
## [1078,]	2.10	8.88633156
## [1079,]	37.00	27.20546913
## [1080,]	17.00	22.70886230
## [1081,]	-26.00	-11.79728603
## [1082,]	0.20	0.90162778
## [1083,]	18.60	18.29361534
## [1084,]	7.97	4.87622261
## [1085,]	16.20	29.25820732
## [1086,]	13.40	13.25702858
## [1087,]	-13.50	-9.21981621
## [1088,]	22.30	21.70326805
## [1089,]	17.40	13.82671642
## [1090,]	29.10	29.96459770
## [1091,]	18.83	15.72267628
## [1092,]	10.13	13.73929691
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## [1094,]	4.00	8.78312206
## [1095,]	5.85	2.15641284
## [1096,]	-28.11	-3.34008479
## [1097,]	20.80	22.85886383
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## [1099,]	8.20	18.65391731

## [1100,]	-25.98	-14.15135670
## [1101,]	15.00	19.14172935
## [1102,]	23.00	15.96842670
## [1103,]	-14.20	-10.14998150
## [1104,]	17.56	35.33976746
## [1105,]	0.25	-12.11086559
## [1106,]	9.81	-2.74729609
## [1107,]	14.10	13.74264050
## [1108,]	-1.20	-0.62405157
## [1109,]	1.07	10.76526356
## [1110,]	10.93	8.25824070
## [1111,]	-23.90	8.65075207
## [1112,]	11.10	9.79444218
## [1113,]	13.70	17.21603966
## [1114,]	12.80	10.83257389
## [1115,]	15.70	19.34527397
## [1116,]	6.30	5.21568871
## [1117,]	22.90	17.32548332
## [1118,]	6.94	6.83312798
## [1119,]	12.70	7.39955521
## [1120,]	28.10	19.10097504
## [1121,]	13.91	17.35618019
## [1122,]	3.80	10.01478481
## [1123,]	18.00	30.22778893
## [1124,]	1.90	-1.70329404
## [1125,]	12.20	17.12343597
## [1126,]	9.40	11.67426586
## [1127,]	3.35	1.14343095
## [1128,]	17.32	19.84679985
## [1129,]	17.01	19.70445824
## [1130,]	14.80	17.50055122
## [1131,]	19.42	19.67778587
## [1132,]	9.26	14.39044762
## [1133,]	20.00	11.76901150
## [1134,]	14.76	12.08934593
## [1135,]	12.54	14.34217834
## [1136,]	12.50	7.78702450
## [1137,]	18.40	17.67796707
## [1138,]	7.40	6.33564758
## [1139,]	9.70	8.37326908
## [1140,]	10.60	9.54234791
## [1141,]	13.84	5.11121559
## [1142,]	10.91	10.07766438
## [1143,]	4.01	5.15352154
## [1144,]	7.84	9.39398766
## [1145,]	20.00	49.43113327
## [1146,]	58.20	20.01880836
## [1147,]	12.00	10.73901081
## [1148,]	10.00	12.06938171
## [1149,]	16.51	14.28107166

## [1150,]	8.39	11.08835125
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## [1152,]	12.97	17.50852013
## [1153,]	21.77	34.79712296
## [1154,]	138.20	64.36740112
## [1155,]	81.50	64.12112427
## [1156,]	17.00	14.67676258
## [1157,]	23.00	14.43284893
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## [1159,]	11.00	7.24546337
## [1160,]	9.00	17.62371635
## [1161,]	23.00	36.09445953
## [1162,]	9.00	17.85936737
## [1163,]	-1.31	-4.53432560
## [1164,]	1.34	-2.09037137
## [1165,]	12.00	13.45294666
## [1166,]	-2.90	-6.79885197
## [1167,]	5.99	2.87295127
## [1168,]	7.30	9.03060246
## [1169,]	14.70	14.33062077
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## [1171,]	7.60	9.29465294
## [1172,]	15.40	21.17199326
## [1173,]	64.30	12.99032688
## [1174,]	52.30	48.69886017
## [1175,]	346.40	86.34902191
## [1176,]	-9.00	3.42602468
## [1177,]	3.40	1.31896114
## [1178,]	17.00	8.48103905
## [1179,]	2.30	0.67518353
## [1180,]	19.40	25.22140503
## [1181,]	14.00	16.08508492
## [1182,]	10.40	16.88449478
## [1183,]	27.70	33.20874786
## [1184,]	15.90	27.07927895
## [1185,]	12.28	11.11128139
## [1186,]	8.30	8.27737236
## [1187,]	19.10	20.51005363
## [1188,]	9.00	-3.52251267
## [1189,]	39.00	5.71267891
## [1190,]	10.40	9.11807919
## [1191,]	10.50	9.23924923
## [1192,]	12.00	12.09629345
## [1193,]	15.50	18.48037529
## [1194,]	14.90	11.17843151
## [1195,]	9.40	10.10207272
## [1196,]	34.40	29.69366646
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## [1203,]	14.90	11.85672474
## [1204,]	24.33	45.57839966
## [1205,]	24.21	27.18639183
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## [1207,]	11.08	16.01845932
## [1208,]	18.43	17.89570618
## [1209,]	23.20	16.36352539
## [1210,]	10.02	11.80763245
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## [1213,]	23.99	13.31380367
## [1214,]	-3.90	-4.35420990
## [1215,]	7.07	8.52664661
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## [1217,]	4.03	-1.87158823
## [1218,]	22.60	31.63882828
## [1219,]	5.77	10.91020107
## [1220,]	-0.02	0.20741582
## [1221,]	-17.90	4.45903397
## [1222,]	72.00	44.60751724
## [1223,]	28.80	28.92479706
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## [1227,]	47.70	35.39697647
## [1228,]	3.49	2.26133370
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## [1235,]	31.90	24.36525536
## [1236,]	64.40	28.60968399
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## [1240,]	10.00	8.96161938
## [1241,]	17.00	17.92258644
## [1242,]	16.57	23.30337334
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## [1244,]	37.87	33.27622604
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## [1250,]	0.10	-5.09075546
## [1251,]	19.00	24.84164238
## [1252,]	4.73	8.45122528
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## [1254,]	13.56	13.82446671
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## [1256,]	27.10	16.85909843
## [1257,]	15.50	13.24897003
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## [1266,]	25.18	33.26213837
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## [1294,]	-18.77	-10.79477406
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## [1307,]	17.40	18.31575775
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## [1309,]	38.20	36.17051315
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## [1311,]	25.60	29.46196556
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## [1316,]	12.75	7.51674843
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## [1337,]	6.12	9.75930119
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## [1369,]	17.40	15.78910255
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## [1372,]	15.60	14.55737591
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## [1390,]	6.35	10.36584091
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## [1413,]	-5.23	-4.98020649
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## [1418,]	4.82	7.24546337
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## [1436,]	-46.10	-17.18848991
## [1437,]	-40.56	-12.37385178
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## [1479,]	12.00	15.00800610
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## [1481,]	34.00	28.45756149
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## [1483,]	5.57	5.33071899
## [1484,]	15.90	27.68592644
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## [1486,]	6.58	11.96647549
## [1487,]	16.10	22.87280655
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## [1490,]	8.20	-2.80409479
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## [1492,]	30.80	11.18007660
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## [1500,]	8.30	9.39990902
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## [1517,]	1.65	0.87407422
## [1518,]	88.20	60.80101776
## [1519,]	5.60	-0.02209330
## [1520,]	-1.60	-5.96662712
## [1521,]	10.70	9.20230389
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## [1527,]	-8.60	7.68438339
## [1528,]	-9.12	-13.71801853
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## [1531,]	12.12	17.98428726
## [1532,]	25.25	11.58798313
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## [1537,]	56.48	35.28738403
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## [1541,]	30.00	18.21024323
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## [1560,]	21.80	24.68543243
## [1561,]	6.70	8.65683746
## [1562,]	-9.21	-4.10610008
## [1563,]	16.40	23.33627510
## [1564,]	-0.58	-7.62645054
## [1565,]	2.56	6.68839169
## [1566,]	18.40	54.65800095
## [1567,]	14.60	29.24814415
## [1568,]	10.30	15.84719944
## [1569,]	9.60	9.73904324
## [1570,]	11.90	15.05197906
## [1571,]	10.30	12.63568592
## [1572,]	29.50	30.68124008
## [1573,]	30.00	22.89695549
## [1574,]	17.10	12.82440090
## [1575,]	23.12	24.23970413
## [1576,]	12.08	11.77668285
## [1577,]	14.89	14.19515133
## [1578,]	16.24	22.10725212
## [1579,]	20.20	10.90015793
## [1580,]	11.23	14.50908089
## [1581,]	11.70	10.14535809
## [1582,]	24.72	22.96711922
## [1583,]	30.00	38.30557251
## [1584,]	21.00	31.66194916
## [1585,]	15.30	23.78508568
## [1586,]	58.20	47.73591232
## [1587,]	8.20	12.45537663
## [1588,]	31.10	24.75340652
## [1589,]	11.60	21.21694183
## [1590,]	20.75	22.49288940
## [1591,]	-10.96	-8.97121525
## [1592,]	23.11	25.59364510
## [1593,]	18.20	21.09713173
## [1594,]	17.95	20.23952866
## [1595,]	20.60	26.89618874
## [1596,]	19.94	17.60885811
## [1597,]	8.00	9.53852940
## [1598,]	15.90	17.56634521
## [1599,]	9.90	11.26266956

```
## [1600,]      8.60    7.30395603
## [1601,]      4.05    1.76963305
## [1602,]     19.21   17.05658913
## [1603,]     15.11   29.66844368
## [1604,]     19.60   19.99011612
## [1605,]     30.34   36.90039825
## [1606,]     23.57   15.63009739
## [1607,]     25.14   17.75883865
## [1608,]     26.70   38.69302750
## [1609,]     42.10   55.71314240
## [1610,]     -2.80    5.77933025
## [1611,]     20.99   19.32941628
## [1612,]     -3.80    2.73799086
## [1613,]     20.03   17.14580154
## [1614,]     21.80   22.49143410
## [1615,]     18.00   14.24427509
## [1616,]     48.05   42.96601868
## [1617,]      7.71    7.19956684
## [1618,]     43.90   55.29237366
## [1619,]      0.00   -1.71352696
## [1620,]      0.31    7.88227081
## [1621,]     24.40   26.45180702
## [1622,]     22.00   22.58473778
## [1623,]     26.51   20.96960068
```

```
dt <- data.table(testtarget, round(pred,digits=4))
dt <- dt[900:909]
colnames(dt)<-c("Actual","Predicted")
write.csv(dt,'Machine_Learning_NetIRR(%)_Prediction.csv')
```