14.2

Problem- prediction of the number of comments in the upcoming 24 hours on those blogs, The train data was generated from different base times that may temporally overlap. Therefore, if you simply split the train into disjoint partitions, the underlying time intervals may overlap. Therefore, the you should use the provided, temporally disjoint train and test splits to ensure that the evaluation is fair.

a. Read the dataset and identify the right features

Ans: there is no feature column in the dataset.

b. Clean dataset, impute missing values and perform exploratory data analysis.

```
> summary(blogData_train)
       A                  B                  C                  D
E                  F                  G                  H
 Min.   :   0.000   Min.   :  0.000   Min.   :  0.0000   Min.   :   0.0
Min.   :   0.00   Min.   :  0.0000   Min.   :  0.000   Min.   : 0.000000
 1st Qu.:   2.286   1st Qu.:  5.214   1st Qu.:  0.0000   1st Qu.:  29.0
1st Qu.:   0.00   1st Qu.:  0.8916   1st Qu.:  3.075   1st Qu.: 0.000000
 Median :  10.631   Median : 19.353   Median :  0.0000   Median : 162.0
Median :   4.00   Median :  4.1507   Median : 11.051   Median : 0.000000
       I                  J                  K                  L
X          X.1                X.2                X.3
 Min.   :   0.0   Min.   :  0.000   Min.   :  0.000   Min.   :  0.000
Min.   :0   Min.   :   0.0   Min.   :  0.00   Min.   :   0.000
 1st Qu.:  22.0   1st Qu.:  0.000   1st Qu.:  0.775   1st Qu.:  3.045
1st Qu.:0   1st Qu.:  22.0   1st Qu.:  0.00   1st Qu.:   1.825
 Median : 121.0   Median :  1.000   Median :  3.817   Median : 11.001
Median :0   Median : 121.0   Median :  0.00   Median :   9.777
      X.4                X.5                X.6                X.7
X.8                X.9                X.10               X.11
 Min.   :  0.000   Min.   :  0.0000   Min.   :   0.0   Min.   :   0.00
Min.   :-0.66667   Min.   :  0.000   Min.   :-1256.0   Min.   :   0.0
 1st Qu.:  4.529   1st Qu.:  0.0000   1st Qu.:  21.0   1st Qu.:   0.00
1st Qu.: 0.05797   1st Qu.:  4.087   1st Qu.: -369.0   1st Qu.:  19.0
 Median : 16.073   Median :  0.0000   Median : 128.0   Median :   3.00
Median : 0.22381   Median : 14.501   Median : -107.0   Median : 116.0
      X.12               X.13               X.14               X.15
X.16               X.17               X.18               X.19
 Min.   :-138.0000   Min.   :0.0000   Min.   :0.0000   Min.   :0.000000
Min.   : 0.000   Min.   : 0.0000   Min.   :0.00000   Min.   :0.0000
 1st Qu.:   0.0000   1st Qu.:0.0000   1st Qu.:0.0000   1st Qu.:0.000000
1st Qu.: 0.000   1st Qu.: 0.0000   1st Qu.:0.00000   1st Qu.:0.0000
 Median :   0.0000   Median :0.1087   Median :0.3945   Median :0.000000
Median : 2.000   Median : 0.0000   Median :0.04317   Median :0.2482
      X.20               X.21               X.22               X.23
X.24               X.25               X.26               X.27               X.28
 Min.   :0   Min.   : 0.000   Min.   :0.00000   Min.   :0.00000   Min.
:0.0000   Min.   :0   Min.   : 0.000   Min.   :0.0000000   Min.   :0.00000
 1st Qu.:0   1st Qu.: 0.000   1st Qu.:0.00000   1st Qu.:0.00000   1st
Qu.:0.0000   1st Qu.:0   1st Qu.: 0.000   1st Qu.:0.0000000   1st
Qu.:0.00000
 Median :0   Median : 2.000   Median :0.00000   Median :0.03763   Median
:0.2321   Median :0   Median : 2.000   Median :0.0000000   Median :0.09264
      X.29               X.30               X.31               X.32
X.33               X.34               X.35               X.36
 Min.   :0.0000   Min.   :0.000000   Min.   : 0.000   Min.   : 0.0000
Min.   :-0.05556   Min.   :0.0000   Min.   :-20.000   Min.   : 0.000
```

```
 1st Qu.:0.0000   1st Qu.:0.000000   1st Qu.: 0.000   1st Qu.: 0.0000
1st Qu.: 0.00000   1st Qu.:0.0000   1st Qu.: -7.000   1st Qu.: 0.000
 Median :0.3713   Median :0.000000   Median : 2.000   Median : 0.0000
Median : 0.00000   Median :0.3277   Median : -2.000   Median : 2.000
      X.37               X.38               X.39               X.40
X.41              X.42               X.43              X.44
 Min.   :-0.5000000   Min.   :   0.00   Min.   :   0.00   Min.   :   0.00
Min.   :   0.0   Min.   :-1256.000   Min.   : 0.0000   Min.   : 0.0000
 1st Qu.: 0.0000000   1st Qu.:   0.00   1st Qu.:   0.00   1st Qu.:   0.00
1st Qu.:   0.0   1st Qu.:   -1.000   1st Qu.: 0.0000   1st Qu.: 0.0000
 Median : 0.0000000   Median :   3.00   Median :   0.00   Median :   0.00
Median :   2.0   Median :    0.000   Median : 0.0000   Median : 0.0000
      X.45               X.46               X.47               X.48
X.49              X.50               X.51              X.52
 Min.   : 0.0000   Min.   : 0.0000   Min.   :-20.00000   Min.   : 0.00
Min.   :    0   Min.   :0.000000   Min.   :0.0000   Min.   :0.00e+00
 1st Qu.: 0.0000   1st Qu.: 0.0000   1st Qu.:  0.00000   1st Qu.:14.00
1st Qu.:   93   1st Qu.:0.000000   1st Qu.:0.0000   1st Qu.:0.00e+00
 Median : 0.0000   Median : 0.0000   Median :  0.00000   Median :35.00
Median : 1859   Median :0.000000   Median :0.0000   Median :0.00e+00
      X.53               X.54               X.55               X.56
X.57               X.58               X.59              X.60
 Min.   :0.0000000   Min.   :0.0000   Min.   :0.0000   Min.   :0.0000
Min.   :0.000000   Min.   :0.000000   Min.   :0.000   Min.   :0.00e+00
 1st Qu.:0.0000000   1st Qu.:0.0000   1st Qu.:0.0000   1st Qu.:0.0000
1st Qu.:0.000000   1st Qu.:0.000000   1st Qu.:0.000   1st Qu.:0.00e+00
 Median :0.0000000   Median :0.0000   Median :0.0000   Median :0.0000
Median :0.000000   Median :0.000000   Median :0.000   Median :0.00e+00
      X.61               X.62               X.63               X.64
X.65               X.66              X.67               X.68
 Min.   :0.0000000   Min.   :0.000000   Min.   :0.00e+00   Min.   :0.0000
Min.   :0.000000   Min.   :0.0000   Min.   :0.00e+00   Min.   :0.00e+00
 1st Qu.:0.0000000   1st Qu.:0.000000   1st Qu.:0.00e+00   1st Qu.:0.0000
1st Qu.:0.000000   1st Qu.:0.0000   1st Qu.:0.00e+00   1st Qu.:0.00e+00
 Median :0.0000000   Median :0.000000   Median :0.00e+00   Median :0.0000
Median :0.000000   Median :0.0000   Median :0.00e+00   Median :0.00e+00
      X.69               X.70               X.71               X.72
X.73              X.74               X.75              X.76
 Min.   :0.00000   Min.   :0.000000   Min.   :0.0000000   Min.
:0.0000000   Min.   :0.00000   Min.   :0.0000000   Min.   :0.00000   Min.
:0.00000
 1st Qu.:0.00000   1st Qu.:0.000000   1st Qu.:0.0000000   1st
Qu.:0.0000000   1st Qu.:0.00000   1st Qu.:0.0000000   1st Qu.:0.00000
1st Qu.:0.00000
 Median :0.00000   Median :0.000000   Median :0.0000000   Median
:0.0000000   Median :0.00000   Median :0.0000000   Median :0.00000
Median :0.00000
      X.77               X.78               X.79               X.80
X.81              X.82               X.83
 Min.   :0.0000000   Min.   :0.0000000   Min.   :0.0000000   Min.
:0.000000   Min.   :0.00e+00   Min.   :0.0000000   Min.   :0.00000
 1st Qu.:0.0000000   1st Qu.:0.0000000   1st Qu.:0.0000000   1st
Qu.:0.000000   1st Qu.:0.00e+00   1st Qu.:0.0000000   1st Qu.:0.00000
 Median :0.0000000   Median :0.0000000   Median :0.0000000   Median
:0.000000   Median :0.00e+00   Median :0.0000000   Median :0.00000
      X.84               X.85               X.86               X.87
X.88              X.89               X.90              X.91
 Min.   :0.00e+00   Min.   :0.0000000   Min.   :0.0000000   Min.
:0.000000   Min.   :0.0000   Min.   :0.00000   Min.   :0.00000   Min.
:0.00000
 1st Qu.:0.00e+00   1st Qu.:0.0000000   1st Qu.:0.0000000   1st
Qu.:0.000000   1st Qu.:0.0000   1st Qu.:0.00000   1st Qu.:0.00000   1st
Qu.:0.00000
 Median :0.00e+00   Median :0.0000000   Median :0.0000000   Median
:0.000000   Median :1.0000   Median :0.00000   Median :0.00000   Median
:0.00000
      X.92               X.93               X.94               X.95
X.96               X.97              X.98               X.99
```

```
 Min.   :0.000000   Min.   :0.000000   Min.   :0.000000   Min.   :0.00000
Min.   :0.0000000   Min.   :0.00000   Min.   :0.0000000   Min.
:0.0000000
 1st Qu.:0.000000   1st Qu.:0.000000   1st Qu.:0.000000   1st Qu.:0.00000
1st Qu.:0.0000000   1st Qu.:0.00000   1st Qu.:0.0000000   1st
Qu.:0.0000000
 Median :0.000000   Median :0.000000   Median :0.000000   Median :0.00000
Median :0.0000000   Median :0.00000   Median :0.0000000   Median
:0.0000000
     X.100               X.101            X.102             X.103
X.104             X.105             X.106             X.107
 Min.   :0.0000000   Min.   :0.0000   Min.   :0.00000   Min.   :0.0000
Min.   :0.00000   Min.   :0.00000   Min.   :0.00000   Min.   :0.0000
 1st Qu.:0.0000000   1st Qu.:0.0000   1st Qu.:0.00000   1st Qu.:0.0000
1st Qu.:0.00000   1st Qu.:0.00000   1st Qu.:0.00000   1st Qu.:0.0000
 Median :0.0000000   Median :0.0000   Median :0.00000   Median :0.0000
Median :0.00000   Median :0.00000   Median :0.00000   Median :0.0000
     X.108             X.109             X.110             X.111
X.112             X.113              X.114              X.115
 Min.   :0.00000   Min.   :0.0000   Min.   :0.000000   Min.   :0.0000000
Min.   :0.0000   Min.   :0.0000000   Min.   :0.000000   Min.   :0.00000
 1st Qu.:0.00000   1st Qu.:0.0000   1st Qu.:0.000000   1st Qu.:0.0000000
1st Qu.:0.0000   1st Qu.:0.0000000   1st Qu.:0.000000   1st Qu.:0.00000
 Median :0.00000   Median :0.0000   Median :0.000000   Median :0.0000000
Median :0.0000   Median :0.0000000   Median :0.000000   Median :0.00000
     X.116             X.117             X.118             X.119
X.120              X.121             X.122             X.123
 Min.   :0.0000000   Min.   :0.00e+00   Min.   :0.000000   Min.
:0.00e+00   Min.   :0.0000000   Min.   :0.0000   Min.   :0.00000   Min.
:0.00000
 1st Qu.:0.0000000   1st Qu.:0.00e+00   1st Qu.:0.000000   1st
Qu.:0.00e+00   1st Qu.:0.0000000   1st Qu.:0.0000   1st Qu.:0.00000   1st
Qu.:0.00000
 Median :0.0000000   Median :0.00e+00   Median :0.000000   Median
:0.00e+00   Median :0.0000000   Median :0.0000   Median :0.00000   Median
:0.00000
     X.124             X.125             X.126             X.127
X.128             X.129              X.130             X.131
 Min.   :0.000000   Min.   :0.00000   Min.   :0.0000   Min.   :0.00000
Min.   :0.00000   Min.   :0.000000   Min.   :0.0000   Min.   :0.000000
 1st Qu.:0.000000   1st Qu.:0.00000   1st Qu.:0.0000   1st Qu.:0.00000
1st Qu.:0.00000   1st Qu.:0.000000   1st Qu.:0.0000   1st Qu.:0.000000
 Median :0.000000   Median :0.00000   Median :0.0000   Median :0.00000
Median :0.00000   Median :0.000000   Median :1.0000   Median :0.000000
     X.132             X.133             X.134             X.135
X.136              X.137              X.138             X.139
 Min.   :0.000000   Min.   :0.000000   Min.   :0.000000   Min.
:0.0000000   Min.   :0.00e+00   Min.   :0.000000   Min.   :0.0000   Min.
:0.00000
 1st Qu.:0.000000   1st Qu.:0.000000   1st Qu.:0.000000   1st
Qu.:0.0000000   1st Qu.:0.00e+00   1st Qu.:0.000000   1st Qu.:0.0000   1st
Qu.:0.00000
 Median :0.000000   Median :0.000000   Median :0.000000   Median
:0.0000000   Median :0.00e+00   Median :0.000000   Median :0.0000   Median
:0.00000
     X.140             X.141             X.142              X.143
X.144             X.145             X.146             X.147
 Min.   :0.00000   Min.   :0.00000   Min.   :0.0000000   Min.   :0.00e+00
Min.   :0.000000   Min.   :0.0000   Min.   :0.0000   Min.   :0.000000
 1st Qu.:0.00000   1st Qu.:0.00000   1st Qu.:0.0000000   1st Qu.:0.00e+00
1st Qu.:0.000000   1st Qu.:0.0000   1st Qu.:0.0000   1st Qu.:0.000000
 Median :0.00000   Median :0.00000   Median :0.0000000   Median :0.00e+00
Median :0.000000   Median :0.0000   Median :0.0000   Median :0.000000
     X.148             X.149             X.150             X.151
X.152             X.153              X.154             X.155
 Min.   :0.00e+00   Min.   :0.00000   Min.   :0.0000   Min.   :0.000000
Min.   :0.000000   Min.   :0.00e+00   Min.   :0.000000   Min.   :0.0000000
 1st Qu.:0.00e+00   1st Qu.:0.00000   1st Qu.:0.0000   1st Qu.:0.000000
1st Qu.:0.000000   1st Qu.:0.00e+00   1st Qu.:0.000000   1st Qu.:0.0000000
```

```
 Median :0.00e+00   Median :0.00000   Median :0.0000   Median :0.000000
Median :0.000000   Median :0.00e+00   Median :0.000000   Median :0.0000000
     X.156              X.157              X.158              X.159
X.160              X.161              X.162              X.163
 Min.   :0.00e+00   Min.   :0.0000   Min.   :0.0000000   Min.   :0.00e+00
Min.   :0.0000000   Min.   :0.000   Min.   :0.000000   Min.   :0.000000
 1st Qu.:0.00e+00   1st Qu.:0.0000   1st Qu.:0.0000000   1st Qu.:0.00e+00
1st Qu.:0.0000000   1st Qu.:0.000   1st Qu.:0.000000   1st Qu.:0.000000
 Median :0.00e+00   Median :0.0000   Median :0.0000000   Median :0.00e+00
Median :0.0000000   Median :0.000   Median :0.000000   Median :0.000000
     X.164              X.165              X.166              X.167
X.168              X.169              X.170              X.171
 Min.   :0.000000   Min.   :0.0000000   Min.   :0.00e+00   Min.   :0.00000
Min.   :0.00000   Min.   :0.000000   Min.   :0.00000   Min.   :0.0000
 1st Qu.:0.000000   1st Qu.:0.0000000   1st Qu.:0.00e+00   1st Qu.:0.00000
1st Qu.:0.00000   1st Qu.:0.000000   1st Qu.:0.00000   1st Qu.:0.0000
 Median :0.000000   Median :0.0000000   Median :0.00e+00   Median :0.00000
Median :0.00000   Median :0.000000   Median :0.00000   Median :0.0000
     X.172              X.173              X.174              X.175
X.176              X.177              X.178              X.179
 Min.   :0.0000000   Min.   :0.00000   Min.   :0.00000   Min.   :0.000000
Min.   :0.00000   Min.   :0.00e+00   Min.   :0.0000   Min.   :0.00000
 1st Qu.:0.0000000   1st Qu.:0.00000   1st Qu.:0.00000   1st Qu.:0.000000
1st Qu.:0.00000   1st Qu.:0.00e+00   1st Qu.:0.0000   1st Qu.:0.00000
 Median :0.0000000   Median :0.00000   Median :0.00000   Median :0.000000
Median :0.00000   Median :0.00e+00   Median :0.0000   Median :0.00000
     X.180              X.181              X.182              X.183
X.184              X.185              X.186              X.187
 Min.   :0.0000   Min.   :0.0000   Min.   :0.00000   Min.   :0.00000
Min.   :0.00000   Min.   :0.00e+00   Min.   :0.0000000   Min.   :0.00e+00
 1st Qu.:0.0000   1st Qu.:0.0000   1st Qu.:0.00000   1st Qu.:0.00000   1st
Qu.:0.00000   1st Qu.:0.00e+00   1st Qu.:0.0000000   1st Qu.:0.00e+00
 Median :0.0000   Median :0.0000   Median :0.00000   Median :0.00000
Median :0.00000   Median :0.00e+00   Median :0.0000000   Median :0.00e+00
     X.188              X.189              X.190              X.191
X.192              X.193              X.194              X.195
 Min.   :0.000000   Min.   :0.0000   Min.   :0.0000000   Min.   :0.000000
Min.   :0.00000   Min.   :0.000000   Min.   :0.00000   Min.   :0.00000
 1st Qu.:0.000000   1st Qu.:0.0000   1st Qu.:0.0000000   1st Qu.:0.000000
1st Qu.:0.00000   1st Qu.:0.000000   1st Qu.:0.00000   1st Qu.:0.00000
 Median :0.000000   Median :0.0000   Median :0.0000000   Median :0.000000
Median :0.00000   Median :0.000000   Median :0.00000   Median :0.00000
     X.196              X.197              X.198              X.199
X.200              X.201              X.202              X.203
 Min.   :0.000000   Min.   :0.0000   Min.   :0.000000   Min.   :0.00e+00
Min.   :0.0000   Min.   :0.0000000   Min.   :0.000000   Min.   :0.00000
 1st Qu.:0.000000   1st Qu.:0.0000   1st Qu.:0.000000   1st Qu.:0.00e+00
1st Qu.:0.0000   1st Qu.:0.0000000   1st Qu.:0.000000   1st Qu.:0.00000
 Median :0.000000   Median :0.0000   Median :0.000000   Median :0.00e+00
Median :0.0000   Median :0.0000000   Median :0.000000   Median :0.00000
     X.204              X.205              X.206              X.207
X.208              X.209              X.210              X.211
 Min.   :0.0000000   Min.   :0.000000   Min.   :0.00000   Min.   :0.000000
Min.   :0.00000   Min.   :0.000000   Min.   :0.0000000   Min.   :0.0000000
 1st Qu.:0.0000000   1st Qu.:0.000000   1st Qu.:0.00000   1st Qu.:0.000000
1st Qu.:0.00000   1st Qu.:0.000000   1st Qu.:0.0000000   1st Qu.:0.0000000
 Median :0.0000000   Median :0.000000   Median :0.00000   Median :0.000000
Median :0.00000   Median :0.000000   Median :0.0000000   Median :0.0000000
     X.212              X.213              X.214              X.215
X.216              X.217              X.218              X.219
 Min.   :0.000000   Min.   :0.0000   Min.   :0.000000   Min.   :0.000
Min.   :0.000000   Min.   :0.0000   Min.   :0.000000   Min.   :0.0000
 1st Qu.:0.000000   1st Qu.:0.0000   1st Qu.:0.000000   1st Qu.:0.000
1st Qu.:0.000000   1st Qu.:0.0000   1st Qu.:0.000000   1st Qu.:0.0000
 Median :0.000000   Median :0.0000   Median :0.000000   Median :0.000
Median :0.000000   Median :0.0000   Median :0.000000   Median :0.0000
     X.220              X.221              X.222              X.223
X.224              X.225              X.226              X.227
```

```
 Min.   :0.0000   Min.   :0.00000   Min.   :0.000000   Min.   :0.00e+00
Min.   :0.000000   Min.   :0.000000   Min.   :0.0000000   Min.   :0.000000
 1st Qu.:0.0000   1st Qu.:0.00000   1st Qu.:0.000000   1st Qu.:0.00e+00
1st Qu.:0.000000   1st Qu.:0.000000   1st Qu.:0.0000000   1st Qu.:0.000000
 Median :0.0000   Median :0.00000   Median :0.000000   Median :0.00e+00
Median :0.000000   Median :0.000000   Median :0.0000000   Median :0.000000
     X.228             X.229             X.230             X.231
X.232             X.233             X.234             X.235
 Min.   :0.00000   Min.   :0.00000   Min.   :0.00e+00   Min.   :0.0000000
Min.   :0.00000   Min.   :0.0000   Min.   :0.0000   Min.   :0.0000
 1st Qu.:0.00000   1st Qu.:0.00000   1st Qu.:0.00e+00   1st Qu.:0.0000000
1st Qu.:0.00000   1st Qu.:0.0000   1st Qu.:0.0000   1st Qu.:0.0000
 Median :0.00000   Median :0.00000   Median :0.00e+00   Median :0.0000000
Median :0.00000   Median :1.0000   Median :0.0000   Median :0.0000
     X.236             X.237             X.238             X.239
X.240             X.241             X.242             X.243
 Min.   :0.00000   Min.   :0.00e+00   Min.   :0.00000   Min.   :0.000000
Min.   :0.0000000   Min.   :0.00000   Min.   :0.00000   Min.   :0.0000000
 1st Qu.:0.00000   1st Qu.:0.00e+00   1st Qu.:0.00000   1st Qu.:0.000000
1st Qu.:0.0000000   1st Qu.:0.00000   1st Qu.:0.00000   1st Qu.:0.0000000
 Median :0.00000   Median :0.00e+00   Median :0.00000   Median :0.000000
Median :0.0000000   Median :0.00000   Median :0.00000   Median :0.0000000
     X.244             X.245             X.246             X.247
X.248             X.249             X.250             X.251
 Min.   :0.00000   Min.   :0.00000   Min.   :0.000000   Min.   :0.000000
Min.   :0.000000   Min.   :0.0000000   Min.   :0.0000   Min.   :0.0000
 1st Qu.:0.00000   1st Qu.:0.00000   1st Qu.:0.000000   1st Qu.:0.000000
1st Qu.:0.000000   1st Qu.:0.0000000   1st Qu.:0.0000   1st Qu.:0.0000
 Median :0.00000   Median :0.00000   Median :0.000000   Median :0.000000
Median :0.000000   Median :0.0000000   Median :0.0000   Median :0.0000
     X.252             X.253             X.254             X.255
X.256             X.257             X.258             X.259             X.260
 Min.   :0.0000   Min.   :0.0000   Min.   :0.0000   Min.   :0.0000   Min.
:0.0000   Min.   :0.0000   Min.   :0.0000   Min.   :0.0000   Min.
:0.0000
 1st Qu.:0.0000   1st Qu.:0.0000   1st Qu.:0.0000   1st Qu.:0.0000   1st
Qu.:0.0000   1st Qu.:0.0000   1st Qu.:0.0000   1st Qu.:0.0000   1st
Qu.:0.0000
 Median :0.0000   Median :0.0000   Median :0.0000   Median :0.0000
Median :0.0000   Median :0.0000   Median :0.0000   Median :0.0000   Median
:0.0000
     X.261             X.262             X.263             X.264
X.265       X.266             X.267             Target
 Min.   :0.0000   Min.   :0.00000   Min.   :0.00000   Min.   :  0.0000
Min.   :0   Min.   :   0.000   Min.   :   0.0000   Min.   :   0.000
 1st Qu.:0.0000   1st Qu.:0.00000   1st Qu.:0.00000   1st Qu.:  0.0000
1st Qu.:0   1st Qu.:   0.000   1st Qu.:   0.0000   1st Qu.:   0.000
 Median :0.0000   Median :0.00000   Median :0.00000   Median :  0.0000
Median :0   Median :   0.000   Median :   0.0000   Median :   0.000
 [ reached getOption("max.print") -- omitted 3 rows ]
```

c. Visualize the dataset and make inferences from that?

Ans: answer is same as que e.

d. Perform any 3 hypothesis tests using columns of your choice, make conclusions

According to t-test, p value is 0.0128 which is less than 0.05. hence there is correlation

```
> t.test(blogData_train$A, mu = 40.30467)

        One Sample t-test

data:  blogData_train$A
t = -2.4895, df = 52396, p-value = 0.0128
alternative hypothesis: true mean is not equal to 40.30467
95 percent confidence interval:
```

```
 38.76668 40.12165
sample estimates:
mean of x
 39.44417
```

According to chi square test, p value is 1 which is more than 0.05. hence there is no correlation

```
> chisq.test(blogData_train$A, blogData_train$Target)

        Pearson's Chi-squared test

data:  blogData_train$A and blogData_train$Target
X-squared = 171770, df = 188780, p-value = 1
```

According to Anova test, p value is 0.000 which is less than 0.05. hence there is correlation

```
> results<- aov(A~Target, data = blogData_train)
> summary(results)
              Df    Sum Sq  Mean Sq F value Pr(>F)
Target         1  77304518 77304518   16156 <2e-16 ***
Residuals  52395 250708202     4785
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

e. Create a linear regression model to predict the no.of comments in the next 24hrs (relative to basetime)

```
> summary(mod)

Call:
lm(formula = blogData_train$A ~ blogData_train$Target)

Residuals:
     Min       1Q   Median       3Q      Max
-1311.76   -30.97   -21.92     6.08  1089.09

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)
(Intercept)        32.553104   0.307019   106.0   <2e-16 ***
blogData_train$Target  1.018677   0.008014   127.1   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 69.17 on 52395 degrees of freedom
Multiple R-squared:  0.2357,   Adjusted R-squared:  0.2357
F-statistic: 1.616e+04 on 1 and 52395 DF,  p-value: < 2.2e-16
```

For 1 unit increase there will be 1.01 unit of increase in no.of comments

These 3 terms, t-statistics (127.1), Std Error of regression coefficient (0.008014) and Probability (of committing Type I Error) is 2e-06 [2/1000000 = 0.00000200 = almost 0] are associated with a t test which tests following Null Hypothesis:

Ho: The slope of no.of comments is not significant

Ha: The slope of no.of comments is significant

0.008014 = standard error of regression co-efficient

As p value is 0.000 which is less than 0.05, Reject the Ho (and accept Ha) and conclude that “slope is significant”

Multiple R-squared = 0.2357

23.5% of the variance in Average can be explained by no.of comments [Remaining 76.5% is unexplained variance....due to factors outside the model]

```
> pred<- predict(lm(blogData_train$A~blogData_train$Target))
> pred
        1         2         3         4         5         6         7
8         9        10        11        12        13        14        15
 33.57178  32.55310  32.55310  33.57178  60.05738  32.55310  32.55310
60.05738  41.72120  41.72120  32.55310  32.55310  34.59046  32.55310
45.79590
       16        17        18        19        20        21        22
23        24        25        26        27        28        29        30
 47.83326  35.60913  47.83326  45.79590  33.57178  53.94532  33.57178
53.94532  33.57178  35.60913  35.60913  35.60913  35.60913  34.59046
34.59046
       31        32        33        34        35        36        37
38        39        40        41        42        43        44        45
 37.64649  37.64649  32.55310  32.55310  53.94532  32.55310  32.55310
35.60913  32.55310  32.55310  32.55310  34.59046  32.55310  32.55310
32.55310
       46        47        48        49        50        51        52
53        54        55        56        57        58        59        60
 32.55310  46.81458  44.77723  39.68384  32.55310  32.55310  32.55310
32.55310  32.55310  32.55310  32.55310  32.55310  32.55310  39.68384
35.60913
       61        62        63        64        65        66        67
68        69        70        71        72        73        74        75
 33.57178  33.57178  33.57178  34.59046  34.59046  32.55310  32.55310
37.64649  49.87061  37.64649  32.55310  34.59046  32.55310  33.57178
32.55310
       76        77        78        79        80        81        82
83        84        85        86        87        88        89        90
 33.57178  40.70252  32.55310  32.55310  69.22547  33.57178  34.59046
44.77723  41.72120  40.70252  41.72120  40.70252  36.62781  40.70252
33.57178
       91        92        93        94        95        96        97
98        99       100       101       102       103       104       105
 33.57178  35.60913  35.60913  34.59046  34.59046  33.57178  33.57178
35.60913  35.60913  34.59046  34.59046  35.60913  35.60913  59.03870
34.59046
      106       107       108       109       110       111       112
113       114       115       116       117       118       119       120
 33.57178  37.64649  33.57178  35.60913  34.59046  35.60913  57.00135
57.00135  34.59046  34.59046  35.60913  33.57178 104.87916  32.55310
32.55310
      121       122       123       124       125       126       127
128       129       130       131       132       133       134       135
 36.62781  37.64649  37.64649  37.64649  36.62781  36.62781  36.62781
38.66517  38.66517  38.66517  78.39356  78.39356  40.70252  40.70252
32.55310
      136       137       138       139       140       141       142
143       144       145       146       147       148       149       150
 32.55310  36.62781  36.62781  39.68384  32.55310  32.55310  32.55310
32.55310  32.55310  32.55310  44.77723  32.55310  38.66517  33.57178
36.62781
      151       152       153       154       155       156       157
158       159       160       161       162       163       164       165
 33.57178  32.55310  32.55310  38.66517  32.55310  38.66517  34.59046
34.59046  39.68384  39.68384  37.64649  37.64649  36.62781  36.62781
33.57178
      166       167       168       169       170       171       172
173       174       175       176       177       178       179       180
 33.57178  33.57178  32.55310 107.93519  32.55310 107.93519  52.92664
52.92664  37.64649  37.64649  50.88929  50.88929  33.57178  33.57178
40.70252
```

181	182	183	184	185	186	187	188	189	190	191	192	193	194	195
32.55310	32.55310	34.59046	32.55310	32.55310	38.66517	32.55310	32.55310	32.55310	34.59046	33.57178	33.57178	32.55310	32.55310	32.55310
196	197	198	199	200	201	202	203	204	205	206	207	208	209	210
33.57178	33.57178	32.55310	32.55310	32.55310	32.55310	32.55310	32.55310	32.55310	32.55310	32.55310	32.55310	55.98267	40.70252	37.64649
211	212	213	214	215	216	217	218	219	220	221	222	223	224	225
36.62781	36.62781	36.62781	36.62781	32.55310	35.60913	32.55310	35.60913	36.62781	36.62781	80.43091	80.43091	33.57178	80.43091	33.57178
226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
36.62781	33.57178	33.57178	36.62781	112.00989	112.00989	112.00989	33.57178	32.55310	32.55310	32.55310	32.55310	41.72120	41.72120	41.72120
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255
32.55310	32.55310	32.55310	35.60913	35.60913	35.60913	33.57178	33.57178	33.57178	33.57178	35.60913	32.55310	32.55310	35.60913	35.60913
256	257	258	259	260	261	262	263	264	265	266	267	268	269	270
33.57178	33.57178	33.57178	32.55310	32.55310	32.55310	32.55310	32.55310	32.55310	39.68384	39.68384	39.68384	36.62781	36.62781	36.62781
271	272	273	274	275	276	277	278	279	280	281	282	283	284	285
39.68384	39.68384	39.68384	35.60913	35.60913	33.57178	33.57178	44.77723	32.55310	32.55310	44.77723	38.66517	38.66517	36.62781	36.62781
286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
38.66517	38.66517	38.66517	33.57178	33.57178	33.57178	35.60913	35.60913	35.60913	35.60913	36.62781	36.62781	35.60913	35.60913	32.55310
301	302	303	304	305	306	307	308	309	310	311	312	313	314	315
34.59046	34.59046	34.59046	43.75855	43.75855	35.60913	35.60913	35.60913	34.59046	34.59046	32.55310	32.55310	32.55310	34.59046	34.59046
316	317	318	319	320	321	322	323	324	325	326	327	328	329	330
35.60913	35.60913	33.57178	33.57178	32.55310	32.55310	41.72120	41.72120	41.72120	39.68384	39.68384	41.72120	34.59046	69.22547	69.22547
331	332	333	334	335	336	337	338	339	340	341	342	343	344	345
34.59046	34.59046	34.59046	42.73987	40.70252	34.59046	40.70252	32.55310	34.59046	32.55310	34.59046	34.59046	41.72120	41.72120	40.70252
346	347	348	349	350	351	352	353	354	355	356	357	358	359	360
39.68384	39.68384	40.70252	32.55310	37.64649	37.64649	32.55310	32.55310	33.57178	33.57178	32.55310	32.55310	33.57178	32.55310	35.60913
361	362	363	364	365	366	367	368	369	370	371	372	373	374	375
32.55310	35.60913	33.57178	88.58033	88.58033	46.81458	46.81458	32.55310	32.55310	40.70252	36.62781	33.57178	43.75855	34.59046	32.55310
376	377	378	379	380	381	382	383	384	385	386	387	388	389	390

 36.62781 34.59046 33.57178 34.59046 34.59046 32.55310 32.55310
32.55310 32.55310 42.73987 42.73987 42.73987 42.73987 51.90796
37.64649
      391   392   393   394   395   396   397
398   399   400   401   402   403   404   405
 51.90796 47.83326 37.64649 47.83326 47.83326 35.60913 36.62781
36.62781 38.66517 35.60913 35.60913 35.60913 35.60913 38.66517
35.60913
      406   407   408   409   410   411   412
413   414   415   416   417   418   419   420
 33.57178 40.70252 40.70252 42.73987 33.57178 32.55310 32.55310
32.55310 42.73987 33.57178 32.55310 36.62781 32.55310 36.62781
32.55310
      421   422   423   424   425   426   427
428   429   430   431   432   433   434   435
 37.64649 35.60913 42.73987 32.55310 32.55310 32.55310 32.55310
32.55310 32.55310 34.59046 34.59046 40.70252 51.90796 40.70252
51.90796
      436   437   438   439   440   441   442
443   444   445   446   447   448   449   450
 33.57178 36.62781 33.57178 36.62781 41.72120 41.72120 32.55310
32.55310 38.66517 38.66517 33.57178 33.57178 33.57178 33.57178
34.59046
      451   452   453   454   455   456   457
458   459   460   461   462   463   464   465
 34.59046 35.60913 35.60913 92.65503 92.65503 32.55310 32.55310
50.88929 50.88929 36.62781 32.55310 32.55310 36.62781 39.68384
38.66517
      466   467   468   469   470   471   472
473   474   475   476   477   478   479   480
 38.66517 36.62781 39.68384 32.55310 32.55310 36.62781 37.64649
35.60913 37.64649 35.60913 38.66517 38.66517 158.86902 158.86902
158.86902
      481   482   483   484   485   486   487
488   489   490   491   492   493   494   495
158.86902 88.58033 88.58033 88.58033 88.58033 53.94532 53.94532
53.94532 53.94532 41.72120 41.72120 33.57178 33.57178 33.57178
33.57178
      496   497   498   499   500   501   502
503   504   505   506   507   508   509   510
 64.13208 64.13208 39.68384 39.68384 35.60913 35.60913 34.59046
34.59046 32.55310 32.55310 40.70252 40.70252 36.62781 36.62781
36.62781
      511   512   513   514   515   516   517
518   519   520   521   522   523   524   525
 41.72120 41.72120 41.72120 35.60913 35.60913 35.60913 32.55310
32.55310 32.55310 32.55310 40.70252 40.70252 32.55310 40.70252
32.55310
      526   527   528   529   530   531   532
533   534   535   536   537   538   539   540
 32.55310 32.55310 32.55310 32.55310 32.55310 32.55310 41.72120
64.13208 42.73987 45.79590 45.79590 45.79590 44.77723 44.77723
44.77723
      541   542   543   544   545   546   547
548   549   550   551   552   553   554   555
 37.64649 37.64649 37.64649 35.60913 35.60913 72.28150 35.60913
35.60913 72.28150 72.28150 73.30018 38.66517 38.66517 73.30018
73.30018
      556   557   558   559   560   561   562
563   564   565   566   567   568   569   570
 48.85193 48.85193 48.85193 50.88929 37.64649 33.57178 32.55310
37.64649 34.59046 40.70252 47.83326 41.72120 33.57178 33.57178
33.57178
      571   572   573   574   575   576   577
578   579   580   581   582   583   584   585
 33.57178 34.59046 34.59046 42.73987 42.73987 42.73987 38.66517
38.66517 38.66517 33.57178 33.57178 33.57178 54.96399 54.96399
33.57178

586	587	588	589	590	591	592	593	594	595	596	597	598	599	600
33.57178	34.59046	34.59046	33.57178	33.57178	38.66517	32.55310	32.55310	38.66517	38.66517	38.66517	34.59046	32.55310	32.55310	34.59046
601	602	603	604	605	606	607	608	609	610	611	612	613	614	615
34.59046	34.59046	34.59046	34.59046	34.59046	34.59046	32.55310	32.55310	46.81458	33.57178	46.81458	33.57178	37.64649	32.55310	37.64649
616	617	618	619	620	621	622	623	624	625	626	627	628	629	630
32.55310	34.59046	34.59046	50.88929	50.88929	38.66517	39.68384	45.79590	45.79590	45.79590	39.68384	38.66517	33.57178	35.60913	32.55310
631	632	633	634	635	636	637	638	639	640	641	642	643	644	645
32.55310	32.55310	35.60913	33.57178	32.55310	32.55310	32.55310	32.55310	32.55310	39.68384	39.68384	33.57178	33.57178	33.57178	33.57178
646	647	648	649	650	651	652	653	654	655	656	657	658	659	660
33.57178	33.57178	32.55310	32.55310	32.55310	32.55310	71.26282	35.60913	36.62781	32.55310	53.94532	32.55310	43.75855	57.00135	42.73987
661	662	663	664	665	666	667	668	669	670	671	672	673	674	675
33.57178	33.57178	32.55310	32.55310	32.55310	32.55310	54.96399	54.96399	32.55310	32.55310	35.60913	35.60913	58.02002	74.31885	46.81458
676	677	678	679	680	681	682	683	684	685	686	687	688	689	690
34.59046	34.59046	32.55310	32.55310	33.57178	32.55310	33.57178	32.55310	32.55310	32.55310	32.55310	32.55310	34.59046	34.59046	34.59046
691	692	693	694	695	696	697	698	699	700	701	702	703	704	705
32.55310	32.55310	32.55310	34.59046	34.59046	34.59046	32.55310	34.59046	34.59046	32.55310	34.59046	65.15076	65.15076	32.55310	65.15076
706	707	708	709	710	711	712	713	714	715	716	717	718	719	720
42.73987	42.73987	42.73987	34.59046	34.59046	34.59046	38.66517	38.66517	38.66517	39.68384	34.59046	34.59046	39.68384	39.68384	32.55310
721	722	723	724	725	726	727	728	729	730	731	732	733	734	735
32.55310	32.55310	32.55310	33.57178	33.57178	33.57178	34.59046	34.59046	32.55310	34.59046	32.55310	32.55310	33.57178	33.57178	32.55310
736	737	738	739	740	741	742	743	744	745	746	747	748	749	750
33.57178	32.55310	32.55310	34.59046	34.59046	34.59046	36.62781	36.62781	36.62781	36.62781	36.62781	36.62781	32.55310	32.55310	32.55310
751	752	753	754	755	756	757	758	759	760	761	762	763	764	765
33.57178	33.57178	33.57178	34.59046	34.59046	34.59046	32.55310	32.55310	32.55310	34.59046	34.59046	34.59046	39.68384	39.68384	39.68384
766	767	768	769	770	771	772	773	774	775	776	777	778	779	780
32.55310	32.55310	32.55310	38.66517	38.66517	38.66517	32.55310	32.55310	32.55310	32.55310	32.55310	36.62781	36.62781	36.62781	32.55310
781	782	783	784	785	786	787	788	789	790	791	792	793	794	795

```
 32.55310  44.77723  44.77723  44.77723  32.55310  32.55310  33.57178
57.00135  57.00135  57.00135  33.57178  33.57178  32.55310  32.55310
32.55310
      796       797       798       799       800       801       802
803       804       805       806       807       808       809       810
 38.66517  38.66517  38.66517  35.60913  35.60913  35.60913  32.55310
32.55310  32.55310  32.55310  32.55310  32.55310  35.60913  35.60913
32.55310
      811       812       813       814       815       816       817
818       819       820       821       822       823       824       825
 35.60913  32.55310  32.55310  33.57178  33.57178  33.57178  33.57178
33.57178  33.57178  33.57178  33.57178  33.57178  33.57178  33.57178
33.57178
      826       827       828       829       830       831       832
833       834       835       836       837       838       839       840
 34.59046  34.59046  34.59046  32.55310  32.55310  32.55310  32.55310
32.55310  32.55310  32.55310  32.55310  32.55310  32.55310  32.55310
32.55310
      841       842       843       844       845       846       847
848       849       850       851       852       853       854       855
 32.55310  32.55310  32.55310  33.57178  33.57178  32.55310  32.55310
32.55310  32.55310  32.55310  32.55310  33.57178  42.73987  42.73987
42.73987
      856       857       858       859       860       861       862
863       864       865       866       867       868       869       870
 37.64649  33.57178  33.57178  37.64649  33.57178  37.64649  35.60913
35.60913  35.60913  33.57178  33.57178  33.57178  32.55310  32.55310
32.55310
      871       872       873       874       875       876       877
878       879       880       881       882       883       884       885
 32.55310  32.55310  32.55310  33.57178  33.57178  33.57178  32.55310
32.55310  39.68384  32.55310  39.68384  32.55310  32.55310  35.60913
32.55310
      886       887       888       889       890       891       892
893       894       895       896       897       898       899       900
 35.60913  32.55310  32.55310  33.57178  32.55310  33.57178  33.57178
33.57178  35.60913  33.57178  35.60913  32.55310  32.55310  32.55310
32.55310
      901       902       903       904       905       906       907
908       909       910       911       912       913       914       915
 32.55310  32.55310  34.59046  32.55310  32.55310  34.59046  32.55310
34.59046  32.55310  33.57178  34.59046  34.59046  33.57178  33.57178
34.59046
      916       917       918       919       920       921       922
923       924       925       926       927       928       929       930
 32.55310  33.57178  33.57178  32.55310  32.55310  33.57178  34.59046
33.57178  33.57178  34.59046  33.57178  34.59046  33.57178  33.57178
33.57178
      931       932       933       934       935       936       937
938       939       940       941       942       943       944       945
 32.55310  44.77723  44.77723  44.77723  32.55310  32.55310  32.55310
32.55310  32.55310  36.62781  32.55310  32.55310  36.62781  32.55310
36.62781
      946       947       948       949       950       951       952
953       954       955       956       957       958       959       960
 32.55310  32.55310  32.55310  35.60913  35.60913  35.60913  33.57178
33.57178  33.57178  33.57178  55.98267  55.98267  33.57178  55.98267
33.57178
      961       962       963       964       965       966       967
968       969       970       971       972       973       974       975
 55.98267  34.59046  46.81458  46.81458  34.59046  46.81458  34.59046
46.81458  37.64649  37.64649  32.55310  37.64649  32.55310  32.55310
37.64649
      976       977       978       979       980       981       982
983       984       985       986       987       988       989       990
 32.55310  32.55310  32.55310  32.55310  32.55310  32.55310  32.55310
32.55310  32.55310  34.59046  32.55310  32.55310  34.59046  32.55310
32.55310
```

```
      991       992       993       994       995       996       997
998       999      1000
 34.59046  32.55310  32.55310  32.55310  32.55310  32.55310  32.55310
32.55310  32.55310  32.55310
 [ reached getOption("max.print") -- omitted 51397 entries ]
```

f. Fine tune the model and represent important features

Ans: topic not covered in class.

g. Interpret the summary of the linear model

```
> summary(mod)

Call:
lm(formula = blogData_train$A ~ blogData_train$Target)

Residuals:
     Min       1Q   Median       3Q      Max
-1311.76   -30.97   -21.92     6.08  1089.09

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)          32.553104   0.307019   106.0   <2e-16 ***
blogData_train$Target  1.018677   0.008014   127.1   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 69.17 on 52395 degrees of freedom
Multiple R-squared:  0.2357,   Adjusted R-squared:  0.2357
F-statistic: 1.616e+04 on 1 and 52395 DF,  p-value: < 2.2e-16
```

For 1 unit increase there will be 1.01 unit of increase in no.of comments

These 3 terms, t-statistics (127.1), Std Error of regression coefficient (0.008014) and Probability (of committing Type I Error) is 2e-06 [2/1000000 = 0.00000200 = almost 0] are associated with a t test which tests following Null Hypothesis:

Ho: The slope of no.of comments is not significant

Ha: The slope of no.of comments is significant

0.008014 = standard error of regression co-efficient

As p value is 0.000 which is less than 0.05, Reject the Ho (and accept Ha) and conclude that “slope is significant”

Multiple R-squared = 0.2357

23.5% of the variance in Average can be explained by no.of comments [Remaining 76.5% is unexplained variance....due to factors outside the model]

h. Report the test accuracy vs. the training accuracy

Ans: topic not covered in class.

i. Interpret the final model coefficients

Ho: The slope of no.of comments is not significant

Ha: The slope of no.of comments is significant

0.008014 = standard error of regression co-efficient

As p value is 0.000 which is less than 0.05, Reject the Ho (and accept Ha) and conclude that "slope is significant"

Multiple R-squared = 0.2357

23.5% of the variance in Average can be explained by no.of comments [Remaining 76.5% is unexplained variance....due to factors outside the model]

j. Plot the model result and compare it with assumptions of the model

```
> summary(mod)

Call:
lm(formula = blogData_train$A ~ blogData_train$Target)

Residuals:
     Min       1Q   Median       3Q      Max
-1311.76   -30.97   -21.92     6.08  1089.09

Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)           32.553104   0.307019   106.0   <2e-16 ***
blogData_train$Target  1.018677   0.008014   127.1   <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 69.17 on 52395 degrees of freedom
Multiple R-squared:  0.2357,   Adjusted R-squared:  0.2357
F-statistic: 1.616e+04 on 1 and 52395 DF,  p-value: < 2.2e-16
```

For 1 unit increase there will be 1.01 unit of increase in no.of comments

These 3 terms, t-statistics (127.1), Std Error of regression coefficient (0.008014) and Probability (of committing Type I Error) is 2e-06 [2/1000000 = 0.00000200 = almost 0] are associated with a t test which tests following Null Hypothesis:

Ho: The slope of no.of comments is not significant

Ha: The slope of no.of comments is significant

0.008014 = standard error of regression co-efficient

As p value is 0.000 which is less than 0.05, Reject the Ho (and accept Ha) and conclude that "slope is significant"

Multiple R-squared = 0.2357

23.5% of the variance in Average can be explained by no.of comments [Remaining 76.5% is unexplained variance....due to factors outside the model]

```
> pred<- predict(lm(blogData_train$A~blogData_train$Target))
> pred
       1        2        3        4        5        6        7
8        9       10       11       12       13       14       15
 33.57178  32.55310  32.55310  33.57178  60.05738  32.55310  32.55310
60.05738  41.72120  41.72120  32.55310  32.55310  34.59046  32.55310
45.79590
      16       17       18       19       20       21       22
23       24       25       26       27       28       29       30
```

```
 47.83326  35.60913  47.83326  45.79590  33.57178  53.94532  33.57178
53.94532  33.57178  35.60913  35.60913  35.60913  35.60913  34.59046
34.59046
       31        32        33        34        35        36        37
38        39        40        41        42        43        44        45
 37.64649  37.64649  32.55310  32.55310  53.94532  32.55310  32.55310
35.60913  32.55310  32.55310  32.55310  34.59046  32.55310  32.55310
32.55310
       46        47        48        49        50        51        52
53        54        55        56        57        58        59        60
 32.55310  46.81458  44.77723  39.68384  32.55310  32.55310  32.55310
32.55310  32.55310  32.55310  32.55310  32.55310  32.55310  39.68384
35.60913
       61        62        63        64        65        66        67
68        69        70        71        72        73        74        75
 33.57178  33.57178  33.57178  34.59046  34.59046  32.55310  32.55310
37.64649  49.87061  37.64649  32.55310  34.59046  32.55310  33.57178
32.55310
       76        77        78        79        80        81        82
83        84        85        86        87        88        89        90
 33.57178  40.70252  32.55310  32.55310  69.22547  33.57178  34.59046
44.77723  41.72120  40.70252  41.72120  40.70252  36.62781  40.70252
33.57178
       91        92        93        94        95        96        97
98        99       100       101       102       103       104       105
 33.57178  35.60913  35.60913  34.59046  34.59046  33.57178  33.57178
35.60913  35.60913  34.59046  34.59046  35.60913  35.60913  59.03870
34.59046
      106       107       108       109       110       111       112
113       114       115       116       117       118       119       120
 33.57178  37.64649  33.57178  35.60913  34.59046  35.60913  57.00135
57.00135  34.59046  34.59046  35.60913  33.57178 104.87916  32.55310
32.55310
      121       122       123       124       125       126       127
128       129       130       131       132       133       134       135
 36.62781  37.64649  37.64649  37.64649  36.62781  36.62781  36.62781
38.66517  38.66517  38.66517  78.39356  78.39356  40.70252  40.70252
32.55310
      136       137       138       139       140       141       142
143       144       145       146       147       148       149       150
 32.55310  36.62781  36.62781  39.68384  32.55310  32.55310  32.55310
32.55310  32.55310  32.55310  44.77723  32.55310  38.66517  33.57178
36.62781
      151       152       153       154       155       156       157
158       159       160       161       162       163       164       165
 33.57178  32.55310  32.55310  38.66517  32.55310  38.66517  34.59046
34.59046  39.68384  39.68384  37.64649  37.64649  36.62781  36.62781
33.57178
      166       167       168       169       170       171       172
173       174       175       176       177       178       179       180
 33.57178  33.57178  32.55310 107.93519  32.55310 107.93519  52.92664
52.92664  37.64649  37.64649  50.88929  50.88929  33.57178  33.57178
40.70252
      181       182       183       184       185       186       187
188       189       190       191       192       193       194       195
 32.55310  32.55310  34.59046  32.55310  32.55310  38.66517  32.55310
32.55310  32.55310  34.59046  33.57178  33.57178  32.55310  32.55310
32.55310
      196       197       198       199       200       201       202
203       204       205       206       207       208       209       210
 33.57178  33.57178  32.55310  32.55310  32.55310  32.55310  32.55310
32.55310  32.55310  32.55310  32.55310  32.55310  55.98267  40.70252
37.64649
      211       212       213       214       215       216       217
218       219       220       221       222       223       224       225
 36.62781  36.62781  36.62781  36.62781  32.55310  35.60913  32.55310
35.60913  36.62781  36.62781  80.43091  80.43091  33.57178  80.43091
33.57178
```

226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
36.62781	33.57178	33.57178	36.62781	112.00989	112.00989	112.00989	33.57178	32.55310	32.55310	32.55310	32.55310	41.72120	41.72120	41.72120
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255
32.55310	32.55310	32.55310	35.60913	35.60913	35.60913	33.57178	33.57178	33.57178	33.57178	35.60913	32.55310	32.55310	35.60913	35.60913
256	257	258	259	260	261	262	263	264	265	266	267	268	269	270
33.57178	33.57178	33.57178	32.55310	32.55310	32.55310	32.55310	32.55310	32.55310	39.68384	39.68384	39.68384	36.62781	36.62781	36.62781
271	272	273	274	275	276	277	278	279	280	281	282	283	284	285
39.68384	39.68384	39.68384	35.60913	35.60913	33.57178	33.57178	44.77723	32.55310	32.55310	44.77723	38.66517	38.66517	36.62781	36.62781
286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
38.66517	38.66517	38.66517	33.57178	33.57178	33.57178	35.60913	35.60913	35.60913	36.62781	36.62781	35.60913	35.60913	32.55310	32.55310
301	302	303	304	305	306	307	308	309	310	311	312	313	314	315
34.59046	34.59046	34.59046	43.75855	43.75855	35.60913	35.60913	35.60913	34.59046	34.59046	32.55310	32.55310	32.55310	34.59046	34.59046
316	317	318	319	320	321	322	323	324	325	326	327	328	329	330
35.60913	35.60913	33.57178	33.57178	32.55310	32.55310	41.72120	41.72120	41.72120	39.68384	39.68384	41.72120	34.59046	69.22547	69.22547
331	332	333	334	335	336	337	338	339	340	341	342	343	344	345
34.59046	34.59046	34.59046	42.73987	40.70252	34.59046	40.70252	32.55310	34.59046	32.55310	34.59046	34.59046	41.72120	41.72120	40.70252
346	347	348	349	350	351	352	353	354	355	356	357	358	359	360
39.68384	39.68384	40.70252	32.55310	37.64649	37.64649	32.55310	32.55310	33.57178	33.57178	32.55310	32.55310	33.57178	32.55310	35.60913
361	362	363	364	365	366	367	368	369	370	371	372	373	374	375
32.55310	35.60913	33.57178	88.58033	88.58033	46.81458	46.81458	32.55310	32.55310	40.70252	36.62781	33.57178	43.75855	34.59046	32.55310
376	377	378	379	380	381	382	383	384	385	386	387	388	389	390
36.62781	34.59046	33.57178	34.59046	34.59046	32.55310	32.55310	32.55310	32.55310	42.73987	42.73987	42.73987	42.73987	51.90796	37.64649
391	392	393	394	395	396	397	398	399	400	401	402	403	404	405
51.90796	47.83326	37.64649	47.83326	47.83326	35.60913	36.62781	36.62781	38.66517	35.60913	35.60913	35.60913	35.60913	38.66517	35.60913
406	407	408	409	410	411	412	413	414	415	416	417	418	419	420
33.57178	40.70252	40.70252	42.73987	33.57178	32.55310	32.55310	32.55310	42.73987	33.57178	32.55310	36.62781	32.55310	36.62781	32.55310
421	422	423	424	425	426	427	428	429	430	431	432	433	434	435

 37.64649 35.60913 42.73987 32.55310 32.55310 32.55310 32.55310
32.55310 32.55310 34.59046 34.59046 40.70252 51.90796 40.70252
51.90796
      436   437   438   439   440   441   442
443   444   445   446   447   448   449   450
 33.57178 36.62781 33.57178 36.62781 41.72120 41.72120 32.55310
32.55310 38.66517 38.66517 33.57178 33.57178 33.57178 33.57178
34.59046
      451   452   453   454   455   456   457
458   459   460   461   462   463   464   465
 34.59046 35.60913 35.60913 92.65503 92.65503 32.55310 32.55310
50.88929 50.88929 36.62781 32.55310 32.55310 36.62781 39.68384
38.66517
      466   467   468   469   470   471   472
473   474   475   476   477   478   479   480
 38.66517 36.62781 39.68384 32.55310 32.55310 36.62781 37.64649
35.60913 37.64649 35.60913 38.66517 38.66517 158.86902 158.86902
158.86902
      481   482   483   484   485   486   487
488   489   490   491   492   493   494   495
158.86902 88.58033 88.58033 88.58033 88.58033 53.94532 53.94532
53.94532 53.94532 41.72120 41.72120 33.57178 33.57178 33.57178
33.57178
      496   497   498   499   500   501   502
503   504   505   506   507   508   509   510
 64.13208 64.13208 39.68384 39.68384 35.60913 35.60913 34.59046
34.59046 32.55310 32.55310 40.70252 40.70252 36.62781 36.62781
36.62781
      511   512   513   514   515   516   517
518   519   520   521   522   523   524   525
 41.72120 41.72120 41.72120 35.60913 35.60913 35.60913 32.55310
32.55310 32.55310 32.55310 40.70252 40.70252 32.55310 40.70252
32.55310
      526   527   528   529   530   531   532
533   534   535   536   537   538   539   540
 32.55310 32.55310 32.55310 32.55310 32.55310 32.55310 41.72120
64.13208 42.73987 45.79590 45.79590 45.79590 44.77723 44.77723
44.77723
      541   542   543   544   545   546   547
548   549   550   551   552   553   554   555
 37.64649 37.64649 37.64649 35.60913 35.60913 72.28150 35.60913
35.60913 72.28150 72.28150 73.30018 38.66517 38.66517 73.30018
73.30018
      556   557   558   559   560   561   562
563   564   565   566   567   568   569   570
 48.85193 48.85193 48.85193 50.88929 37.64649 33.57178 32.55310
37.64649 34.59046 40.70252 47.83326 41.72120 33.57178 33.57178
33.57178
      571   572   573   574   575   576   577
578   579   580   581   582   583   584   585
 33.57178 34.59046 34.59046 42.73987 42.73987 42.73987 38.66517
38.66517 38.66517 33.57178 33.57178 33.57178 54.96399 54.96399
33.57178
      586   587   588   589   590   591   592
593   594   595   596   597   598   599   600
 33.57178 34.59046 34.59046 33.57178 33.57178 38.66517 32.55310
32.55310 38.66517 38.66517 38.66517 34.59046 32.55310 32.55310
34.59046
      601   602   603   604   605   606   607
608   609   610   611   612   613   614   615
 34.59046 34.59046 34.59046 34.59046 34.59046 34.59046 32.55310
32.55310 46.81458 33.57178 46.81458 33.57178 37.64649 32.55310
37.64649
      616   617   618   619   620   621   622
623   624   625   626   627   628   629   630
 32.55310 34.59046 34.59046 50.88929 50.88929 38.66517 39.68384
45.79590 45.79590 45.79590 39.68384 38.66517 33.57178 35.60913
32.55310

631	632	633	634	635	636	637	638	639	640	641	642	643	644	645
32.55310	32.55310	35.60913	33.57178	32.55310	32.55310	32.55310	32.55310	32.55310	39.68384	39.68384	33.57178	33.57178	33.57178	33.57178
646	647	648	649	650	651	652	653	654	655	656	657	658	659	660
33.57178	33.57178	32.55310	32.55310	32.55310	32.55310	71.26282	35.60913	36.62781	32.55310	53.94532	32.55310	43.75855	57.00135	42.73987
661	662	663	664	665	666	667	668	669	670	671	672	673	674	675
33.57178	33.57178	32.55310	32.55310	32.55310	32.55310	54.96399	54.96399	32.55310	32.55310	35.60913	35.60913	58.02002	74.31885	46.81458
676	677	678	679	680	681	682	683	684	685	686	687	688	689	690
34.59046	34.59046	32.55310	32.55310	33.57178	32.55310	33.57178	32.55310	32.55310	32.55310	32.55310	32.55310	34.59046	34.59046	34.59046
691	692	693	694	695	696	697	698	699	700	701	702	703	704	705
32.55310	32.55310	32.55310	34.59046	34.59046	34.59046	32.55310	34.59046	34.59046	32.55310	34.59046	65.15076	65.15076	32.55310	65.15076
706	707	708	709	710	711	712	713	714	715	716	717	718	719	720
42.73987	42.73987	42.73987	34.59046	34.59046	34.59046	38.66517	38.66517	38.66517	39.68384	34.59046	34.59046	39.68384	39.68384	32.55310
721	722	723	724	725	726	727	728	729	730	731	732	733	734	735
32.55310	32.55310	32.55310	33.57178	33.57178	33.57178	34.59046	34.59046	32.55310	34.59046	32.55310	32.55310	33.57178	33.57178	32.55310
736	737	738	739	740	741	742	743	744	745	746	747	748	749	750
33.57178	32.55310	32.55310	34.59046	34.59046	34.59046	36.62781	36.62781	36.62781	36.62781	36.62781	36.62781	32.55310	32.55310	32.55310
751	752	753	754	755	756	757	758	759	760	761	762	763	764	765
33.57178	33.57178	33.57178	34.59046	34.59046	34.59046	32.55310	32.55310	32.55310	34.59046	34.59046	34.59046	39.68384	39.68384	39.68384
766	767	768	769	770	771	772	773	774	775	776	777	778	779	780
32.55310	32.55310	32.55310	38.66517	38.66517	38.66517	32.55310	32.55310	32.55310	32.55310	32.55310	36.62781	36.62781	36.62781	32.55310
781	782	783	784	785	786	787	788	789	790	791	792	793	794	795
32.55310	44.77723	44.77723	44.77723	32.55310	32.55310	33.57178	57.00135	57.00135	57.00135	33.57178	33.57178	32.55310	32.55310	32.55310
796	797	798	799	800	801	802	803	804	805	806	807	808	809	810
38.66517	38.66517	38.66517	35.60913	35.60913	35.60913	32.55310	32.55310	32.55310	32.55310	32.55310	32.55310	35.60913	35.60913	32.55310
811	812	813	814	815	816	817	818	819	820	821	822	823	824	825
35.60913	32.55310	32.55310	33.57178	33.57178	33.57178	33.57178	33.57178	33.57178	33.57178	33.57178	33.57178	33.57178	33.57178	33.57178
826	827	828	829	830	831	832	833	834	835	836	837	838	839	840

```
 34.59046  34.59046  34.59046  32.55310  32.55310  32.55310  32.55310
32.55310  32.55310  32.55310  32.55310  32.55310  32.55310  32.55310
32.55310
      841       842       843       844       845       846       847
848       849       850       851       852       853       854       855
 32.55310  32.55310  32.55310  33.57178  33.57178  32.55310  32.55310
32.55310  32.55310  32.55310  32.55310  33.57178  42.73987  42.73987
42.73987
      856       857       858       859       860       861       862
863       864       865       866       867       868       869       870
 37.64649  33.57178  33.57178  37.64649  33.57178  37.64649  35.60913
35.60913  35.60913  33.57178  33.57178  33.57178  32.55310  32.55310
32.55310
      871       872       873       874       875       876       877
878       879       880       881       882       883       884       885
 32.55310  32.55310  32.55310  33.57178  33.57178  33.57178  32.55310
32.55310  39.68384  32.55310  39.68384  32.55310  32.55310  35.60913
32.55310
      886       887       888       889       890       891       892
893       894       895       896       897       898       899       900
 35.60913  32.55310  32.55310  33.57178  32.55310  33.57178  33.57178
33.57178  35.60913  33.57178  35.60913  32.55310  32.55310  32.55310
32.55310
      901       902       903       904       905       906       907
908       909       910       911       912       913       914       915
 32.55310  32.55310  34.59046  32.55310  32.55310  34.59046  32.55310
34.59046  32.55310  33.57178  34.59046  34.59046  33.57178  33.57178
34.59046
      916       917       918       919       920       921       922
923       924       925       926       927       928       929       930
 32.55310  33.57178  33.57178  32.55310  32.55310  33.57178  34.59046
33.57178  33.57178  34.59046  33.57178  34.59046  33.57178  33.57178
33.57178
      931       932       933       934       935       936       937
938       939       940       941       942       943       944       945
 32.55310  44.77723  44.77723  44.77723  32.55310  32.55310  32.55310
32.55310  32.55310  36.62781  32.55310  32.55310  36.62781  32.55310
36.62781
      946       947       948       949       950       951       952
953       954       955       956       957       958       959       960
 32.55310  32.55310  32.55310  35.60913  35.60913  35.60913  33.57178
33.57178  33.57178  33.57178  55.98267  55.98267  33.57178  55.98267
33.57178
      961       962       963       964       965       966       967
968       969       970       971       972       973       974       975
 55.98267  34.59046  46.81458  46.81458  34.59046  46.81458  34.59046
46.81458  37.64649  37.64649  32.55310  37.64649  32.55310  32.55310
37.64649
      976       977       978       979       980       981       982
983       984       985       986       987       988       989       990
 32.55310  32.55310  32.55310  32.55310  32.55310  32.55310  32.55310
32.55310  32.55310  34.59046  32.55310  32.55310  34.59046  32.55310
32.55310
      991       992       993       994       995       996       997
998       999      1000
 34.59046  32.55310  32.55310  32.55310  32.55310  32.55310  32.55310
32.55310  32.55310  32.55310
 [ reached getOption("max.print") -- omitted 51397 entries ]
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