

PRIMER EXAMEN PARCIAL

Indicaciones:

Despues de haber descargado el proyecto asignado en Rstudio, elabore un archivo con extension .Rnw en el que se resuelva cada uno de los numerales siguientes. Una vez que haya analizado los ejercicios tendra que actualizar su proyecto en el repositorio de github.

PROBLEMA 1

a) En sus palabras, cuales son las ventajas que considera que tiene R con respecto a otros software para el analisis de datos?

1- Es un software libre el cual se puede utilizar, modificar y compartir sin ninguna restriccion.

2- Es mucho mas estable que que otros programas utilizados para este fin.

3- Es mucho mas liviano y por consiguiente no requiere inversion en equipos informaticos con grandes caracteristicas.

b) Cual el el nombre y numero de la version de R actual, la anterior a la actual y la posterior a la actual y cual es el periodo de tiempo que tiene CRAN para liberar una nueva version?

El nombre es: Fire Safety;La version de R actual es 3.2.2, La anterior es 3.2.1; Segun la logica la version que sigue es la 3.2.3.

c) Explique la logica de como cambian los numeros de las versiones de R

Aumenta el ultimo digito de la derecha y posteriormente aumenta el digito de el centro y vuelve a iniciar en cero el ultimo de la derecha.

PROBLEMA 2

```
> A <- matrix(c(1, 2, 2, 1, 3, 4), nrow=2, ncol=3); A
```

```
      [,1] [,2] [,3]
[1,]     1     2     3
[2,]     2     1     4
```

```
> B <- matrix(c(1, 2, 3, 0, 1, 2), nrow=3, ncol=2);B
```

```
      [,1] [,2]
[1,]     1     0
[2,]     2     1
[3,]     3     2
```

```
> C <- matrix(c(3,4,2,-1,1,1,3,5,3), nrow=3, ncol=3);C
```

```
      [,1] [,2] [,3]
[1,]     3    -1     3
[2,]     4     1     5
[3,]     2     1     3
```

```

> D <- matrix(c(3, 2, -2, 4), nrow=2, ncol=2);D

      [,1] [,2]
[1,]     3  -2
[2,]     2   4

> E <- matrix(c(2,0,3,-4,1,2,5,4,1), nrow=3, ncol=3);E

      [,1] [,2] [,3]
[1,]     2  -4   5
[2,]     0   1   4
[3,]     3   2   1

> f <- matrix(c(-4,2,5,3), nrow=2, ncol=2);f

      [,1] [,2]
[1,]    -4   5
[2,]     2   3

> O <- matrix(c(0,0,0,0,0,0,0,0,0),nrow=3, ncol=3);O

      [,1] [,2] [,3]
[1,]     0   0   0
[2,]     0   0   0
[3,]     0   0   0

> C+E

      [,1] [,2] [,3]
[1,]     5  -5   8
[2,]     4   2   9
[3,]     5   3   4

> E+C

      [,1] [,2] [,3]
[1,]     5  -5   8
[2,]     4   2   9
[3,]     5   3   4

> D-f

      [,1] [,2]
[1,]     7  -7
[2,]     0   1

> -3*C

```

```

      [,1] [,2] [,3]
[1,]   -9    3   -9
[2,]  -12   -3  -15
[3,]   -6   -3   -9

```

> 5*O

```

      [,1] [,2] [,3]
[1,]     0    0    0
[2,]     0    0    0
[3,]     0    0    0

```

> 2*C

```

      [,1] [,2] [,3]
[1,]     6   -2    6
[2,]     8    2   10
[3,]     4    2    6

```

> 3*E

```

      [,1] [,2] [,3]
[1,]     6  -12   15
[2,]     0    3   12
[3,]     9    6    3

```

> 2*B

```

      [,1] [,2]
[1,]     2    0
[2,]     4    2
[3,]     6    4

```

PROBLEMA 3

Calcule AB con:

> A <- matrix(c(2,3,4,3,2,1,4,2,6,3,5,4), nrow=3, ncol=4); A

```

      [,1] [,2] [,3] [,4]
[1,]     2    3    4    3
[2,]     3    2    2    5
[3,]     4    1    6    4

```

> B <- matrix(c(20,28,30,40,12,15,12,16,8,15,10,20), nrow=4, ncol=3); B

```

      [,1] [,2] [,3]
[1,]    20   12    8
[2,]    28   15   15
[3,]    30   12   10
[4,]    40   16   20

```

```
> P<-A %*%B;P
```

```
      [,1] [,2] [,3]
[1,]  364  165  161
[2,]  376  170  174
[3,]  448  199  187
```

PROBLEMA 4

Investigue como utilizar la funcion readHTMLTable para obtener una base de datos de una pagina web (tablas HTML). Una vez que haya investigado lo anterior obtenga la tabla que se encuentra en la direccion <http://www.jaredlander.com/2012/0/another-kind-of-super-bowl-pool/> y luego muéstrela en pantalla.

```
> library(XML)
> url <- "http://www.jaredlander.com/2012/02/another-kind-of-super-bowl-pool/"
> funcion <- readHTMLTable(url, which = 1, stringsAsFactors = FALSE)
> funcion
```

	V1	V2	V3
1	Participant 1	Giant A	Patriot Q
2	Participant 2	Giant B	Patriot R
3	Participant 3	Giant C	Patriot S
4	Participant 4	Giant D	Patriot T
5	Participant 5	Giant E	Patriot U
6	Participant 6	Giant F	Patriot V
7	Participant 7	Giant G	Patriot W
8	Participant 8	Giant H	Patriot X
9	Participant 9	Giant I	Patriot Y
10	Participant 10	Giant J	Patriot Z

PROBLEMA 5

Cargue la base de datos que se encuentra en la direccion:
<http://www.jaredlander.com/data/Tomato/20First.csv>.
 Y luego muéstrela en pantalla

```
> url<-"http://www.jaredlander.com/data/Tomato%20First.csv"
> basedatos<-read.table(file=url,header=TRUE,sep=",")
> basedatos
```

	Round	Tomato	Price	Source	Sweet	Acid	Color
1	1	Simpson SM	3.99	Whole Foods	2.8	2.8	3.7
2	1	Tuttorosso (blue)	2.99	Pioneer	3.3	2.8	3.4
3	1	Tuttorosso (green)	0.99	Pioneer	2.8	2.6	3.3
4	1	La Fede SM DOP	3.99	Shop Rite	2.6	2.8	3.0
5	2	Cento SM DOP	5.49	D Agostino	3.3	3.1	2.9
6	2	Cento Organic	4.99	D Agostino	3.2	2.9	2.9
7	2	La Valle SM	3.99	Shop Rite	2.6	2.8	3.6
8	2	La Valle SM DOP	3.99	Faicos	2.1	2.7	3.1

9	3	Stanislaus Alta Cucina	4.53	Restaurant Depot	3.4	3.3	4.1
10	3	Ciao	NA	Other	2.6	2.9	3.4
11	3	Scotts Backyard SM	0.00	Home Grown	1.6	2.9	3.1
12	3	Di Casa Barone (organic)	12.80	Eataly	1.7	3.6	3.8
13	4	Trader Joes Plum	1.49	Trader Joes	3.4	3.3	4.0
14	4	365 Whole Foods	1.49	Whole Foods	2.8	2.7	3.4
15	4	Muir Glen Organic	3.19	Whole Foods	2.9	2.8	2.7
16	4	Bionature Organic	3.39	Whole Foods	2.4	3.3	3.4
Texture Overall Avg.of.Totals Total.of.Avg							
1	3.4	3.4	16.1	16.1			
2	3.0	2.9	15.3	15.3			
3	2.8	2.9	14.3	14.3			
4	2.3	2.8	13.4	13.4			
5	2.8	3.1	14.4	15.2			
6	3.1	2.9	15.5	15.1			
7	3.4	2.6	14.7	14.9			
8	2.4	2.2	12.6	12.5			
9	3.2	3.7	17.8	17.7			
10	3.3	2.9	15.3	15.2			
11	2.4	1.9	11.9	11.9			
12	2.3	1.4	12.7	12.7			
13	3.6	3.9	17.8	18.2			
14	3.1	3.1	14.8	15.2			
15	3.2	3.1	14.8	14.7			
16	3.2	2.8	15.1	15.2			

PROBLEMA 6

```
> url<-"http://www.jaredlander.com/data/Tomato%20First.csv"
> basedatos<-read.table(file=url,header=TRUE,sep=",");basedatos
```

Round	Tomato	Price	Source	Sweet	Acid	Color	
1	1	Simpson SM	3.99	Whole Foods	2.8	2.8	3.7
2	1	Tuttorosso (blue)	2.99	Pioneer	3.3	2.8	3.4
3	1	Tuttorosso (green)	0.99	Pioneer	2.8	2.6	3.3
4	1	La Fede SM DOP	3.99	Shop Rite	2.6	2.8	3.0
5	2	Cento SM DOP	5.49	D Agostino	3.3	3.1	2.9
6	2	Cento Organic	4.99	D Agostino	3.2	2.9	2.9
7	2	La Valle SM	3.99	Shop Rite	2.6	2.8	3.6
8	2	La Valle SM DOP	3.99	Faicos	2.1	2.7	3.1
9	3	Stanislaus Alta Cucina	4.53	Restaurant Depot	3.4	3.3	4.1
10	3	Ciao	NA	Other	2.6	2.9	3.4
11	3	Scotts Backyard SM	0.00	Home Grown	1.6	2.9	3.1
12	3	Di Casa Barone (organic)	12.80	Eataly	1.7	3.6	3.8
13	4	Trader Joes Plum	1.49	Trader Joes	3.4	3.3	4.0
14	4	365 Whole Foods	1.49	Whole Foods	2.8	2.7	3.4
15	4	Muir Glen Organic	3.19	Whole Foods	2.9	2.8	2.7

16	4	Bionature Organic	3.39	Whole Foods	2.4	3.3	3.4
	Texture	Overall	Avg.of.Totals	Total.of.Avg			
1	3.4	3.4	16.1	16.1			
2	3.0	2.9	15.3	15.3			
3	2.8	2.9	14.3	14.3			
4	2.3	2.8	13.4	13.4			
5	2.8	3.1	14.4	15.2			
6	3.1	2.9	15.5	15.1			
7	3.4	2.6	14.7	14.9			
8	2.4	2.2	12.6	12.5			
9	3.2	3.7	17.8	17.7			
10	3.3	2.9	15.3	15.2			
11	2.4	1.9	11.9	11.9			
12	2.3	1.4	12.7	12.7			
13	3.6	3.9	17.8	18.2			
14	3.1	3.1	14.8	15.2			
15	3.2	3.1	14.8	14.7			
16	3.2	2.8	15.1	15.2			

```
> basedatos$Tomato
```

[1] Simpson SM	Tuttorosso (blue)	Tuttorosso (green)
[4] La Fede SM DOP	Cento SM DOP	Cento Organic
[7] La Valle SM	La Valle SM DOP	Stanislaus Alta Cucina
[10] Ciao	Scotts Backyard SM	Di Casa Barone (organic)
[13] Trader Joes Plum	365 Whole Foods	Muir Glen Organic
[16] Bionature Organic		

16 Levels: 365 Whole Foods Bionature Organic Cento Organic ... Tuttorosso (green)

```
> basedatos$Sweet
```

```
[1] 2.8 3.3 2.8 2.6 3.3 3.2 2.6 2.1 3.4 2.6 1.6 1.7 3.4 2.8 2.9 2.4
```

```
> basedatos$Acid
```

```
[1] 2.8 2.8 2.6 2.8 3.1 2.9 2.8 2.7 3.3 2.9 2.9 3.6 3.3 2.7 2.8 3.3
```

```
> basedatos$Texture
```

```
[1] 3.4 3.0 2.8 2.3 2.8 3.1 3.4 2.4 3.2 3.3 2.4 2.3 3.6 3.1 3.2 3.2
```

PROBLEMA 7

```
> library(Hmisc)
> bd<-spss.get("empresas.sav",use.value.labels =TRUE)
> bd
```

	ID	AGR	MIN	MAN	CEN	CON	SER	BAN	SEC	SER	TC
1	Bélgica	3.3	0.9	27.6	0.9	8.2	19.1	6.2	26.6	7.2	
2	Dinamarca	9.2	0.1	21.8	0.6	8.3	14.6	6.5	32.2	7.1	
3	Francia	10.8	0.8	27.5	0.9	8.9	16.8	6.0	22.6	5.7	
4	Alemania O	6.7	1.3	35.8	0.9	7.3	14.4	5.0	22.3	6.1	
5	Irlanda	23.2	1.0	20.7	1.3	7.5	16.8	2.8	20.8	6.1	
6	Italia	15.9	0.6	27.6	0.5	10.0	18.1	1.6	20.1	5.7	
7	Luxemburgo	7.7	3.1	30.8	0.8	9.2	18.5	4.6	19.2	6.2	
8	Holanda	6.3	0.1	22.5	1.0	9.9	18.0	6.8	28.5	6.8	
9	Reino Unido	2.7	1.4	30.2	1.4	6.9	16.9	5.7	28.3	6.4	
10	Austria	12.7	1.1	30.2	1.4	9.0	16.8	4.9	16.8	7.0	
11	Finlandia	13.0	0.4	25.9	1.3	7.4	14.7	5.5	24.3	7.6	
12	Grecia	41.4	0.6	17.6	0.6	8.1	11.5	2.4	11.0	6.7	
13	Noruega	9.0	0.5	22.4	0.8	8.6	16.9	4.7	27.6	9.4	
14	Portugal	27.8	0.3	24.5	0.6	8.4	13.3	2.7	16.7	5.7	
15	España	22.9	0.8	28.5	0.7	11.5	9.7	8.5	11.8	5.5	
16	Suecia	6.1	0.4	25.9	0.8	7.2	14.4	6.0	32.4	6.8	
17	Suiza	7.7	0.2	37.8	0.8	9.5	17.5	5.3	15.4	5.7	
18	Turquía	66.8	0.7	7.9	0.1	2.8	5.2	1.1	11.9	3.2	
19	Bulgaria	23.6	1.9	32.3	0.6	7.9	8.0	0.7	18.2	6.7	
20	Checoslovaquia	16.5	2.9	35.5	1.2	8.7	9.2	0.9	17.9	7.0	
21	Alemania E	4.2	2.9	41.2	1.3	7.6	11.2	1.2	22.1	8.4	
22	Hungría	21.7	3.1	29.6	1.9	8.2	9.4	0.9	17.2	8.0	
23	Polonia	31.1	2.5	25.7	0.9	8.4	7.5	0.9	16.1	6.9	
24	Rumanía	34.7	2.1	30.1	0.6	8.7	5.9	1.3	11.7	5.0	
25	Rusia	23.7	1.4	25.8	0.6	9.2	6.1	0.5	23.6	9.3	
26	Yugoslavia	48.7	1.5	16.8	1.1	4.9	6.4	11.3	5.3	4.0	

```
> objetos<-list(AGR="Agricultura",CEN="Centrales de energía",BAN="Bancos",TC="Transporte y
```

```
$AGR
```

```
[1] "Agricultura"
```

```
$CEN
```

```
[1] "Centrales de energía"
```

```
$BAN
```

```
[1] "Bancos"
```

```
$TC
```

```
[1] "Transporte y Comunicaciones"
```

```
> summary(bd$AGR)
```

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
2.70	7.70	14.45	19.13	23.67	66.80

```
> summary(bd$CEN)
```

```

      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
0.1000  0.6000  0.8500  0.9077  1.1750  1.9000

> summary(bd$BAN)

      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
0.500   1.225   4.650   4.000   5.925  11.300

> summary(bd$TC)

      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
3.200   5.700   6.700   6.546   7.075   9.400

```

PROBLEMA 8

```

> base<-read.table("coches.csv",header=TRUE,sep = ",")
> base

```

	consumo	motor	cv	peso	acel	año	origen	cilindr	derivada
1	13	5031	130	1168	12.0	70	1	8	0
2	16	5735	165	1231	11.5	70	1	8	0
3	13	5211	150	1145	11.0	70	1	8	0
4	15	4982	150	1144	12.0	70	1	8	0
5	14	4949	140	1149	10.5	70	1	8	0
6	16	7030	198	1447	10.0	70	1	8	0
7	17	7440	220	1451	9.0	70	1	8	0
8	17	7210	215	1437	8.5	70	1	8	0
9	17	7456	225	1475	10.0	70	1	8	0
10	16	6391	190	1283	8.5	70	1	8	0
11	NA	2179	115	1030	17.5	70	2	4	1
12	NA	5735	165	1380	11.5	70	1	8	0
13	NA	5752	153	1344	11.0	70	1	8	0
14	NA	6276	175	1388	10.5	70	1	8	0
15	NA	5899	175	1283	11.0	70	1	8	0
16	16	6276	170	1187	10.0	70	1	8	0
17	17	5572	160	1203	8.0	70	1	8	0
18	NA	4949	140	1117	8.0	70	1	8	0
19	16	6555	150	1253	9.5	70	1	8	0
20	17	7456	225	1028	10.0	70	1	8	0
21	10	1852	95	790	15.0	70	3	4	1
22	11	3245	95	944	15.5	70	1	6	1
23	13	3261	97	924	15.5	70	1	6	1
24	11	3277	85	862	16.0	70	1	6	1
25	9	1590	88	710	14.5	70	3	4	1
26	9	1590	46	611	20.5	70	2	4	1
27	9	1803	87	890	17.5	70	2	4	1
28	10	1753	90	810	14.5	70	2	4	1

29	9	1704	95	791	17.5	70	2	4	1
30	9	1983	113	744	12.5	70	2	4	1
31	11	3261	90	882	15.0	70	1	6	1
32	24	5899	215	1538	14.0	70	1	8	0
33	24	5031	200	1458	15.0	70	1	8	0
34	21	5211	210	1460	13.5	70	1	8	0
35	26	66	93	244	8.5	0	NA	NA	NA
36	9	1590	88	710	14.5	71	3	4	1
37	8	2294	90	754	15.5	71	1	4	1
38	9	1852	95	742	14.0	71	3	4	1
39	9	1606	NA	682	19.0	71	1	4	1
40	NA	1590	48	659	20.0	71	2	4	1
41	12	3802	100	878	13.0	71	1	6	1
42	15	3687	105	1146	15.5	71	1	6	1
43	14	4097	100	1109	15.5	71	1	6	1
44	12	4097	88	1100	15.5	71	1	6	1
45	13	3802	100	1096	15.5	71	1	6	1
46	17	5735	165	1403	12.0	71	1	8	0
47	17	6555	175	1488	11.5	71	1	8	0
48	17	5752	153	1384	13.5	71	1	8	0
49	17	5211	150	1365	13.0	71	1	8	0
50	20	6276	180	1651	11.5	71	1	8	0
51	18	6555	170	1582	12.0	71	1	8	0
52	18	6555	175	1713	12.0	71	1	8	0
53	13	4228	110	987	13.5	71	1	6	1
54	11	2294	72	802	19.0	71	1	4	1
55	12	4097	100	1094	15.0	71	1	6	1
56	13	4097	88	1046	14.5	71	1	6	1
57	10	1999	86	740	14.0	71	1	4	1
58	8	1901	90	707	14.0	71	2	4	1
59	8	1295	70	691	19.5	71	2	4	1
60	8	1442	76	688	14.5	71	2	4	1
61	8	1163	65	591	19.0	71	3	4	1
62	7	1180	69	537	18.0	71	3	4	1
63	9	1590	60	611	19.0	71	2	4	1
64	9	1491	70	651	20.5	71	1	4	1
65	10	1852	95	759	15.5	72	3	4	1
66	9	1598	80	708	17.0	72	1	4	1
67	10	1590	54	751	23.5	72	2	4	1
68	12	2294	90	802	19.5	72	1	4	1
69	11	1999	86	742	16.5	72	1	4	1
70	18	5735	165	1424	12.0	72	1	8	0
71	17	6555	175	1461	12.0	72	1	8	0
72	16	5211	150	1378	13.5	72	1	8	0
73	17	5752	153	1376	13.0	72	1	8	0
74	14	4982	150	1224	11.5	72	1	8	0

75	21	7030	208	1544	11.0	72	1	8	0
76	18	5735	155	1500	13.5	72	1	8	0
77	20	5735	160	1485	13.5	72	1	8	0
78	18	6555	190	1474	12.5	72	1	8	0
79	12	1147	97	776	13.5	72	3	3	1
80	16	4982	150	1297	12.5	72	1	8	0
81	18	5031	130	1366	14.0	72	1	8	0
82	18	4949	140	1431	16.0	72	1	8	0
83	17	5211	150	1359	14.0	72	1	8	0
84	13	1983	112	977	14.5	72	2	4	1
85	11	1983	76	837	18.0	72	2	4	1
86	11	1966	87	993	19.5	72	2	4	1
87	9	1573	69	729	18.0	72	2	4	1
88	11	1999	86	798	16.0	72	1	4	1
89	8	1590	92	762	17.0	72	3	4	1
90	10	1966	97	835	14.5	72	3	4	1
91	8	1606	80	721	15.0	72	1	4	1
92	9	1590	88	700	16.5	72	3	4	1
93	18	5735	175	1366	13.0	73	1	8	0
94	17	4982	150	1224	11.5	73	1	8	0
95	18	5735	145	1329	13.0	73	1	8	0
96	17	4949	137	1347	14.5	73	1	8	0
97	16	5211	150	1259	12.5	73	1	8	0
98	20	7030	198	1650	11.5	73	1	8	0
99	18	6555	150	1488	12.0	73	1	8	0
100	18	5752	158	1454	13.0	73	1	8	0
101	17	5211	150	1412	14.5	73	1	8	0
102	18	7210	215	1578	11.0	73	1	8	0
103	20	7456	225	1650	11.0	73	1	8	0
104	18	5899	175	1273	11.0	73	1	8	0
105	13	3687	105	1040	16.5	73	1	6	1
106	15	4097	100	1092	18.0	73	1	6	1
107	13	3802	100	981	16.0	73	1	6	1
108	13	4097	88	1007	16.5	73	1	6	1
109	10	3245	95	968	16.0	73	1	6	1
110	9	1590	46	650	21.0	73	2	4	1
111	21	6555	150	1665	14.0	73	1	8	0
112	20	6555	167	1635	12.5	73	1	8	0
113	18	5899	170	1551	13.0	73	1	8	0
114	20	5735	180	1499	12.5	73	1	8	0
115	13	3802	100	929	15.0	73	1	6	1
116	12	1590	88	759	19.0	73	3	4	1
117	11	2294	72	800	19.5	73	1	4	1
118	11	1770	94	793	16.5	73	3	4	1
119	13	1147	90	708	13.5	73	3	3	1
120	12	1999	85	770	18.5	73	1	4	1

121	11	2540	107	824	14.0	73	1	6	1
122	9	1606	90	755	15.5	73	2	4	1
123	16	5735	145	1360	13.0	73	1	8	0
124	15	6555	230	1426	9.5	73	1	8	0
125	8	1114	49	622	19.5	73	2	4	1
126	10	1901	75	719	15.5	73	2	4	1
127	12	1868	91	860	14.0	73	2	4	1
128	12	1983	112	956	15.5	73	2	4	1
129	16	5211	150	1133	11.0	73	1	8	0
130	10	1983	110	886	14.0	73	2	4	1
131	12	2556	122	935	13.5	73	3	6	1
132	21	5735	180	1221	11.0	73	1	8	0
133	12	3245	95	1034	16.5	74	1	6	1
134	11	3277	NA	958	17.0	74	1	6	1
135	12	3802	100	967	16.0	74	1	6	1
136	16	4097	100	1112	17.0	74	1	6	1
137	8	1295	67	650	19.0	74	3	4	1
138	9	1999	80	817	16.5	74	1	4	1
139	7	1163	65	612	21.0	74	3	4	1
140	9	2294	75	847	17.0	74	1	4	1
141	15	4097	100	1260	17.0	74	1	6	1
142	15	4228	110	1210	18.0	74	1	6	1
143	13	3687	105	1204	16.5	74	1	6	1
144	15	4949	140	1380	14.0	74	1	8	0
145	18	5735	150	1566	14.5	74	1	8	0
146	17	5211	150	1485	13.5	74	1	8	0
147	17	4949	140	1546	16.0	74	1	8	0
148	17	4982	150	1419	15.5	74	1	8	0
149	8	1606	83	739	16.5	74	2	4	1
150	9	1295	67	654	15.5	74	2	4	1
151	9	1590	78	766	14.5	74	2	4	1
152	8	1245	52	549	16.5	74	3	4	1
153	7	1360	61	667	19.0	74	3	4	1
154	8	1475	75	708	14.5	74	1	4	1
155	10	1475	75	702	15.5	74	2	4	1
156	9	1901	75	748	14.0	74	2	4	1
157	10	1966	97	829	15.0	74	3	4	1
158	9	1770	93	797	15.5	74	3	4	1
159	8	1295	67	666	16.0	74	2	4	1
160	12	3687	95	1088	16.0	75	1	6	1
161	13	4097	105	1153	16.0	75	1	6	1
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163	16	4097	72	1052	19.5	75	1	6	1
164	15	6555	170	1556	11.5	75	1	8	0
165	16	5735	145	1480	14.0	75	1	8	0
166	15	5211	150	1499	14.5	75	1	8	0

167	17	5752	148	1552	13.5	75	1	8	0
168	14	3785	110	1302	21.0	75	1	6	1
169	15	4097	105	1299	18.5	75	1	6	1
170	16	4228	110	1243	19.0	75	1	6	1
171	13	3687	95	1261	19.0	75	1	6	1
172	11	3785	110	1013	15.0	75	1	6	1
173	12	4293	110	1073	13.5	75	1	8	0
174	18	4949	129	1056	12.0	75	1	8	0
175	8	1590	75	723	16.0	75	3	4	1
176	10	2294	83	879	17.0	75	1	4	1
177	12	3802	100	971	16.0	75	1	6	1
178	10	2294	78	864	18.5	75	1	4	1
179	10	2196	96	900	13.5	75	3	4	1
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181	10	1950	97	848	17.0	75	3	4	1
182	13	2802	97	994	14.5	75	1	6	1
183	8	1475	70	645	14.0	75	2	4	1
184	12	3802	90	1070	17.0	75	1	6	1
185	10	1885	95	898	15.0	75	2	4	1
186	10	1966	88	985	17.0	75	2	4	1
187	11	1983	98	981	14.5	75	2	4	1
188	9	1983	115	890	13.5	75	2	4	1
189	7	1491	53	598	17.5	75	3	4	1
190	8	1753	86	821	15.5	76	2	4	1
191	9	1901	81	740	16.9	76	2	4	1
192	9	2294	92	857	14.9	76	1	4	1
193	9	1606	79	751	17.7	76	1	4	1
194	9	1655	83	734	15.3	76	2	4	1
195	13	4998	140	1405	13.0	76	1	8	0
196	15	5211	150	1396	13.0	76	1	8	0
197	15	4982	120	1320	13.9	76	1	8	0
198	16	5752	152	1405	12.8	76	1	8	0
199	11	3687	100	1077	15.4	76	1	6	1
200	11	4097	105	1117	14.5	76	1	6	1
201	10	3277	81	1004	17.6	76	1	6	1
202	10	3802	90	1028	17.6	76	1	6	1
203	8	1393	52	678	22.2	76	1	4	1
204	10	1606	60	721	22.1	76	1	4	1
205	8	1475	70	645	14.2	76	2	4	1
206	7	1491	53	598	17.4	76	3	4	1
207	12	3687	100	1217	17.7	76	1	6	1
208	13	4097	78	1191	21.0	76	1	6	1
209	13	4097	110	1215	16.2	76	1	6	1
210	13	4228	95	1064	17.8	76	1	6	1
211	8	1590	71	608	12.2	76	2	4	1
212	7	1393	70	663	17.0	76	3	4	1

213	8	1590	75	718	16.4	76	3	4	1
214	9	2294	72	855	13.6	76	1	4	1
215	12	2130	102	1050	15.7	76	2	4	1
216	18	5211	150	1313	13.2	76	1	8	0
217	12	1966	88	1090	21.9	76	2	4	1
218	12	2556	108	976	15.5	76	3	6	1
219	14	2753	120	1273	16.7	76	2	6	1
220	14	5735	180	1460	12.1	76	1	8	0
221	18	5735	145	1351	12.0	76	1	8	0
222	18	4949	130	1290	15.0	76	1	8	0
223	18	5211	150	1251	14.0	76	1	8	0
224	7	1606	68	681	18.5	77	3	4	1
225	8	1819	80	718	14.8	77	1	4	1
226	7	1295	58	608	18.6	77	2	4	1
227	9	1999	96	766	15.5	77	1	4	1
228	7	1393	70	648	16.8	77	3	4	1
229	13	4998	145	1293	12.5	77	1	8	0
230	14	4261	110	1353	19.0	77	1	8	0
231	15	5211	145	1380	13.7	77	1	8	0
232	16	4949	130	1431	14.9	77	1	8	0
233	13	4097	110	1173	16.4	77	1	6	1
234	12	3785	105	1141	16.9	77	1	6	1
235	12	3687	100	1210	17.7	77	1	6	1
236	13	4097	98	1175	19.0	77	1	6	1
237	15	6555	180	1406	11.1	77	1	8	0
238	15	5735	170	1388	11.4	77	1	8	0
239	15	6555	190	1441	12.2	77	1	8	0
240	15	5752	149	1445	14.5	77	1	8	0
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242	10	2474	88	913	16.0	77	1	4	1
243	9	1590	75	755	18.2	77	3	4	1
244	9	2294	89	918	15.8	77	1	4	1
245	8	1606	63	683	17.0	77	1	4	1
246	7	1606	83	691	15.9	77	1	4	1
247	8	1590	67	661	16.4	77	3	4	1
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249	11	2393	97	938	14.5	77	3	6	1
250	11	1983	110	866	12.8	77	2	4	1
251	11	1311	110	906	13.5	77	3	3	NA
252	5	1475	48	661	21.5	78	2	4	1
253	7	1606	66	600	14.4	78	1	4	1
254	7	1278	52	661	19.4	78	3	4	1
255	6	1393	70	690	18.6	78	3	4	1
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257	12	4261	110	1121	15.5	78	1	8	0
258	12	5211	140	1245	13.2	78	1	8	0

259	12	4949	139	1190	12.8	78	1	8	0
260	12	3785	105	1178	19.2	78	1	6	1
261	12	3277	95	1051	18.2	78	1	6	1
262	12	3277	85	988	15.8	78	1	6	1
263	9	2294	88	906	15.4	78	1	4	1
264	12	3687	100	1143	17.2	78	1	6	1
265	12	3802	90	1070	17.2	78	1	6	1
266	11	3785	105	1126	15.8	78	1	6	1
267	11	3277	85	1023	16.7	78	1	6	1
268	13	3687	110	1206	18.7	78	1	6	1
269	13	4228	120	1136	15.1	78	1	6	1
270	12	4998	145	1141	13.2	78	1	8	0
271	13	3785	165	1148	13.4	78	1	6	1
272	13	4949	139	1068	11.2	78	1	8	0
273	13	5211	140	1360	13.7	78	1	8	0
274	8	1606	68	718	16.5	78	1	4	1
275	9	2196	95	853	14.2	78	3	4	1
276	9	1950	97	766	14.7	78	3	4	1
277	8	1721	75	743	14.5	78	1	4	1
278	11	2196	95	838	14.8	78	3	4	1
279	10	2556	105	915	16.7	78	1	4	1
280	10	2474	85	951	17.6	78	1	4	1
281	10	1950	97	801	14.9	78	3	4	1
282	12	2147	103	943	15.9	78	2	5	1
283	14	2671	125	1046	13.6	78	2	6	1
284	11	1983	115	931	15.7	78	2	4	1
285	15	2671	133	1136	15.8	78	2	6	1
286	7	1458	71	663	14.9	78	2	4	1
287	8	1606	68	711	16.6	78	3	4	1
288	11	3785	115	1081	15.4	79	1	6	1
289	12	3277	85	996	18.2	79	1	6	1
290	11	2294	88	963	17.3	79	1	4	1
291	12	3802	90	1088	18.2	79	1	6	1
292	11	3687	110	1120	16.6	79	1	6	1
293	14	4998	130	1280	15.4	79	1	8	0
294	13	4949	129	1241	13.4	79	1	8	0
295	14	5752	138	1318	13.2	79	1	8	0
296	13	5211	135	1276	15.2	79	1	8	0
297	14	5735	155	1453	14.9	79	1	8	0
298	15	5752	142	1351	14.3	79	1	8	0
299	12	4375	125	1201	15.0	79	1	8	0
300	13	5899	150	1313	13.0	79	1	8	0
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302	7	1409	65	658	15.2	79	3	4	1
303	7	1606	80	638	14.4	79	1	4	1
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305	9	2999	77	1176	20.1	79	2	5	1
306	10	5735	125	1300	17.4	79	1	8	0
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310	7	1721	70	716	14.9	79	1	4	1
311	7	1393	65	673	19.2	79	3	4	1
312	6	1491	69	710	14.7	79	2	4	1
313	8	2474	90	890	16.0	79	1	4	1
314	8	2835	115	865	11.3	79	1	6	1
315	9	2835	115	900	12.9	79	1	6	1
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317	6	1606	76	714	14.7	80	2	4	1
318	6	1458	60	656	18.8	80	3	4	1
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321	8	2474	90	892	16.5	80	1	4	1
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326	8	2196	90	903	15.5	80	3	4	1
327	8	1966	75	847	17.5	80	3	4	1
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329	7	1770	75	755	15.2	80	3	4	1
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333	5	1475	48	695	21.7	80	2	4	1
334	5	1475	48	778	23.7	80	2	4	1
335	6	1983	67	983	19.9	80	2	5	1
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337	5	1491	67	616	13.8	80	3	4	1
338	6	1393	NA	611	17.3	80	2	4	1
339	7	1590	67	715	18.0	80	3	4	1
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341	7	2753	132	970	11.4	80	3	6	1
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343	7	1999	88	833	15.1	80	2	4	1
344	10	2294	NA	968	14.3	80	1	4	1
345	7	1753	72	763	17.0	80	3	4	1
346	9	2212	84	830	15.7	81	1	4	1
347	9	2474	84	878	16.4	81	1	4	1
348	9	2556	92	873	14.4	81	1	4	1
349	10	2835	110	908	12.6	81	1	6	1
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351	6	1295	58	585	16.9	81	3	4	1
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354	7	1590	67	688	17.8	81	3	4	1
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358	7	1721	63	738	14.9	81	1	4	1
359	7	1606	65	681	16.2	81	1	4	1
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375	13	3687	85	1155	16.6	81	1	6	1
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381	9	2474	90	911	18.0	82	1	4	1
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383	10	2474	NA	1011	20.5	82	1	4	1
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386	8	1491	68	656	17.6	82	3	4	1
387	6	1721	63	708	14.7	82	1	4	1
388	7	1606	70	708	17.3	82	1	4	1
389	7	1966	88	720	14.5	82	3	4	1
390	7	1753	75	735	14.5	82	3	4	1
391	7	1770	70	748	16.9	82	3	4	1
392	6	1491	67	655	15.0	82	3	4	1
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397	9	2556	92	861	14.5	82	1	4	1
398	11	3802	112	945	14.7	82	1	6	1
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400	7	2212	84	790	13.0	82	1	4	1
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403	5	1590	52	710	24.6	82	2	4	1
404	7	2212	84	765	11.6	82	1	4	1
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406	8	1950	82	906	19.4	82	1	4	1

PROBLEMA 10

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9	9	10.21
10	10	10.78
11	11	11.57
12	12	12.55
13	13	13.86
14	14	14.34
15	15	14.77
16	16	15.88
17	17	17.10
18	18	17.91
19	19	19.31
20	20	20.62
21	21	22.13
22	22	23.04
23	23	23.93
24	24	24.87
25	25	25.83
26	26	26.09
27	27	27.42
28	28	27.82
29	29	27.73
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