

Intro to Data Science - HW 2

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```
# Enter your name here: Bhavya Shah
```

Attribution statement: (choose only one and delete the rest)

```
# 1. I did this homework by myself, with help from the book and the professor.
```

Reminders of things to practice from last week:

Assignment arrow: <-

The combine command: c()

Descriptive statistics: mean() sum() max()

Arithmetic operators: + - * /

Boolean operators: > < >= <= == !=

This Week: Explore the **quakes** dataset (which is included in R).

Step 0: Prepare the data

A. Copy the **quakes** dataset into a new dataframe (call it **myQuakes**), so that if you need to start over, you can do so easily (by copying **quakes** into **myQuakes** again). Summarize the variables in **myQuakes** using an R command. Also, explore the structure of the dataframe - using another R command. In a brief comment, describe what this dataset is about based on your analysis of the variables in it.

```
myQuakes <- quakes
```

Step 1: Explore the earthquake magnitude variable called **mag**

A. What is the average magnitude? Use mean() or summary():

```
summary(myQuakes)
```

```
##      lat        long       depth       mag
## Min. :-38.59  Min. :165.7  Min. : 40.0  Min. :4.00
## 1st Qu.:-23.47 1st Qu.:179.6  1st Qu.: 99.0  1st Qu.:4.30
## Median :-20.30 Median :181.4  Median :247.0  Median :4.60
## Mean   :-20.64 Mean   :179.5  Mean   :311.4  Mean   :4.62
## 3rd Qu.:-17.64 3rd Qu.:183.2  3rd Qu.:543.0  3rd Qu.:4.90
## Max.  :-10.72 Max.  :188.1   Max.  :680.0  Max.  :6.40
##      stations
## Min.  : 10.00
## 1st Qu.: 18.00
## Median : 27.00
## Mean   : 33.42
## 3rd Qu.: 42.00
## Max.  :132.00
```

#according to the output the average magnitude is 4.62.

B. What is the magnitude of the smallest earthquake? Use min() or summary() and save the result in a variable called **minQuake**:

```
minQuake <- min(myQuakes$mag)
minQuake
```

```
## [1] 4
```

C. What is the magnitude of the largest earthquake? Use max() or summary() and save the result in a variable called **maxQuake**:

```
maxQuake <- max(myQuakes$mag)
maxQuake
```

```
## [1] 6.4
```

D. Output the **fourth row** of the dataframe:

```
myQuakes[4, ]
```

```
##      lat    long   depth   mag stations
## 4 -17.97 181.66   626 4.1       19
```

E. Create a new dataframe, with only the rows where the **magnitude is greater than 4**. How many rows are in that dataframe (report this number using code, do not count by looking at the output):

```
newmagni <- myQuakes[myQuakes$mag>4, ]
newmagniDF<-data.frame(newmagni)
nrow(newmagniDF)
```

```
## [1] 954
```

F. Using the **arrange()** function, create a **sorted dataframe** based on magnitude and store it in **quakeSorted1**. Explain how this function works.

```
library(tidyverse)
```

```
## — Attaching packages tidyverse 1.3.2 —
## ✓ ggplot2 3.4.0     ✓ purrr   1.0.1
## ✓ tibble  3.1.8     ✓ dplyr   1.0.10
## ✓ tidyr   1.3.0      ✓ stringr 1.5.0
## ✓ readr   2.1.3      ✓ forcats 1.0.0
## — Conflicts tidyverse_conflicts() —
## ✘ dplyr::filter() masks stats::filter()
## ✘ dplyr::lag()   masks stats::lag()
```

```
quakeSortedDF1 <- myQuakes %>% arrange(mag)
quakeSortedDF1
```

```
##      lat   long depth mag stations
## 1 -20.42 181.96   649 4.0     11
## 2 -19.68 184.31   195 4.0     12
## 3 -17.94 181.49   537 4.0     15
## 4 -23.55 180.80   349 4.0     10
## 5 -19.26 184.42   223 4.0     15
## 6 -22.06 180.60   584 4.0     11
## 7 -15.31 185.80   152 4.0     11
## 8 -17.70 181.70   450 4.0     11
## 9 -19.73 182.40   375 4.0     18
## 10 -19.06 182.45   477 4.0     16
## 11 -20.65 181.40   582 4.0     14
## 12 -17.90 181.50   573 4.0     19
## 13 -17.70 182.20   445 4.0     12
## 14 -23.54 179.93   574 4.0     12
## 15 -17.70 185.00   383 4.0     10
## 16 -17.94 181.51   601 4.0     16
## 17 -30.64 181.20   175 4.0     16
## 18 -16.90 185.72   135 4.0     22
## 19 -10.72 165.99   195 4.0     14
## 20 -18.55 182.23   563 4.0     17
## 21 -22.70 183.30   180 4.0     13
## 22 -21.00 183.20   296 4.0     16
## 23 -17.02 182.93   406 4.0     17
## 24 -19.51 183.97   280 4.0     16
## 25 -15.43 185.19   249 4.0     11
## 26 -17.91 181.48   555 4.0     17
## 27 -17.10 182.80   390 4.0     14
## 28 -30.30 180.80   275 4.0     14
## 29 -25.60 180.30   440 4.0     12
## 30 -20.70 186.30    80 4.0     10
## 31 -16.40 182.73   391 4.0     16
## 32 -21.60 180.50   595 4.0     22
## 33 -17.90 181.50   589 4.0     12
## 34 -28.00 182.00   199 4.0     16
## 35 -22.12 180.49   532 4.0     14
## 36 -21.62 182.40   350 4.0     12
## 37 -19.70 182.44   397 4.0     12
## 38 -18.50 185.40   243 4.0     11
## 39 -21.03 180.78   638 4.0     14
## 40 -17.80 181.20   530 4.0     15
## 41 -17.82 181.27   538 4.0     33
## 42 -25.06 182.80   133 4.0     14
## 43 -18.14 181.71   574 4.0     20
## 44 -23.49 180.06   530 4.0     23
## 45 -17.86 181.30   614 4.0     12
## 46 -17.95 181.37   642 4.0     17
## 47 -17.97 181.66   626 4.1     19
## 48 -17.66 181.40   585 4.1     17
## 49 -21.16 182.40   260 4.1     12
## 50 -20.14 181.60   587 4.1     13
## 51 -19.21 184.70   197 4.1     11
```

## 52	-16.98	185.61	108	4.1	12
## 53	-17.98	180.50	626	4.1	19
## 54	-20.20	180.90	627	4.1	11
## 55	-15.20	184.68	99	4.1	14
## 56	-15.03	182.29	399	4.1	10
## 57	-17.84	181.48	542	4.1	20
## 58	-20.45	181.85	534	4.1	14
## 59	-24.08	179.50	605	4.1	21
## 60	-28.25	181.71	226	4.1	19
## 61	-24.36	182.84	148	4.1	16
## 62	-23.80	179.90	498	4.1	12
## 63	-17.68	181.36	515	4.1	19
## 64	-17.32	181.03	497	4.1	13
## 65	-17.46	181.32	573	4.1	17
## 66	-23.44	182.93	158	4.1	20
## 67	-17.04	186.80	70	4.1	22
## 68	-18.40	183.40	343	4.1	10
## 69	-14.85	184.87	294	4.1	10
## 70	-17.90	181.30	593	4.1	13
## 71	-17.61	181.20	537	4.1	11
## 72	-17.14	185.31	223	4.1	15
## 73	-17.81	181.82	598	4.1	14
## 74	-19.22	182.54	570	4.1	22
## 75	-21.79	185.00	74	4.1	15
## 76	-17.80	181.32	539	4.1	12
## 77	-18.89	181.24	655	4.1	14
## 78	-17.60	181.50	548	4.1	10
## 79	-17.20	182.90	383	4.1	11
## 80	-25.14	178.42	554	4.1	15
## 81	-16.43	186.73	75	4.1	20
## 82	-17.78	185.33	223	4.1	10
## 83	-19.10	184.52	230	4.1	16
## 84	-21.77	181.00	618	4.1	10
## 85	-18.07	181.65	593	4.1	16
## 86	-20.21	181.90	576	4.1	16
## 87	-19.13	184.97	210	4.1	22
## 88	-22.10	180.40	603	4.1	11
## 89	-22.14	179.62	587	4.1	23
## 90	-15.70	185.10	70	4.1	15
## 91	-19.40	182.29	326	4.1	15
## 92	-15.85	185.90	121	4.1	17
## 93	-17.56	181.23	580	4.1	16
## 94	-15.18	185.93	77	4.1	16
## 95	-15.65	185.17	315	4.1	15
## 96	-17.93	181.89	567	4.1	27
## 97	-17.74	181.25	559	4.1	16
## 98	-18.40	181.77	600	4.1	11
## 99	-23.47	179.95	543	4.1	21
## 100	-19.69	184.23	223	4.1	23
## 101	-17.99	181.59	595	4.1	26
## 102	-20.62	181.03	650	4.2	15
## 103	-10.98	166.32	211	4.2	12

## 104	-18.75	182.35	554	4.2	13
## 105	-20.10	182.16	489	4.2	16
## 106	-21.81	181.71	323	4.2	15
## 107	-15.43	186.30	123	4.2	16
## 108	-19.72	169.71	271	4.2	14
## 109	-15.44	185.26	224	4.2	21
## 110	-19.44	183.50	293	4.2	15
## 111	-16.85	182.31	388	4.2	14
## 112	-26.13	178.31	609	4.2	25
## 113	-18.96	169.48	248	4.2	13
## 114	-19.30	183.84	517	4.2	21
## 115	-17.05	181.22	527	4.2	24
## 116	-18.84	184.16	210	4.2	17
## 117	-14.31	173.50	614	4.2	23
## 118	-20.10	184.40	186	4.2	10
## 119	-11.80	165.80	112	4.2	20
## 120	-11.75	166.07	69	4.2	14
## 121	-20.30	183.00	375	4.2	15
## 122	-20.36	181.19	637	4.2	23
## 123	-20.20	182.30	533	4.2	11
## 124	-26.67	182.40	186	4.2	17
## 125	-18.31	182.39	342	4.2	14
## 126	-20.37	182.10	397	4.2	22
## 127	-21.55	182.90	207	4.2	18
## 128	-19.15	169.50	150	4.2	12
## 129	-20.32	180.88	680	4.2	22
## 130	-23.81	179.36	521	4.2	23
## 131	-19.41	183.05	300	4.2	16
## 132	-20.16	181.99	504	4.2	11
## 133	-22.32	180.54	565	4.2	12
## 134	-19.30	180.60	671	4.2	16
## 135	-21.04	181.20	483	4.2	10
## 136	-27.22	182.28	65	4.2	14
## 137	-17.98	181.58	590	4.2	14
## 138	-15.83	182.51	423	4.2	21
## 139	-17.82	181.49	573	4.2	14
## 140	-17.46	181.90	417	4.2	14
## 141	-23.70	179.60	646	4.2	21
## 142	-33.20	181.60	153	4.2	21
## 143	-17.47	180.96	546	4.2	23
## 144	-23.45	180.23	520	4.2	19
## 145	-16.04	183.54	384	4.2	23
## 146	-24.03	180.22	508	4.2	23
## 147	-19.41	182.30	589	4.2	19
## 148	-15.96	166.69	150	4.2	20
## 149	-15.29	166.90	100	4.2	15
## 150	-23.12	184.42	104	4.2	17
## 151	-23.65	184.46	93	4.2	16
## 152	-25.04	180.97	393	4.2	21
## 153	-19.92	183.91	264	4.2	23
## 154	-19.60	181.87	597	4.2	18
## 155	-25.25	179.86	491	4.2	23

```
## 156 -21.46 181.02 584 4.2    18
## 157 -17.40 186.54   85 4.2    28
## 158 -20.48 181.38 556 4.2    13
## 159 -17.88 180.58 622 4.2    23
## 160 -18.44 181.04 624 4.2    21
## 161 -18.69 169.10 218 4.2    27
## 162 -17.61 183.32 356 4.2    15
## 163 -20.61 182.44 518 4.2    10
## 164 -13.90 167.18 221 4.2    21
## 165 -26.10 182.50 133 4.2    17
## 166 -24.89 179.67 498 4.2    14
## 167 -18.04 181.84 611 4.2    20
## 168 -10.80 165.80 175 4.2    12
## 169 -30.63 180.90 334 4.2    28
## 170 -19.20 184.37 220 4.2    18
## 171 -26.06 180.05 432 4.2    19
## 172 -20.87 181.70 560 4.2    13
## 173 -22.85 181.37 397 4.2    15
## 174 -17.08 185.96 180 4.2    29
## 175 -20.91 181.57 530 4.2    20
## 176 -18.85 182.20 501 4.2    23
## 177 -18.40 184.84 221 4.2    18
## 178 -21.20 181.40 560 4.2    12
## 179 -11.70 166.30 139 4.2    15
## 180 -22.24 180.28 601 4.2    21
## 181 -17.46 181.42 524 4.2    16
## 182 -17.44 181.33 545 4.2    37
## 183 -24.71 179.85 477 4.2    34
## 184 -19.57 184.47 202 4.2    28
## 185 -23.47 180.21 553 4.2    23
## 186 -20.77 181.16 568 4.2    12
## 187 -18.98 182.32 442 4.2    22
## 188 -21.40 180.74 613 4.2    20
## 189 -17.03 185.74 178 4.2    32
## 190 -12.37 166.93 291 4.2    16
## 191 -17.70 188.10   45 4.2    10
## 192 -17.47 179.59 622 4.3    19
## 193 -15.94 184.95 306 4.3    11
## 194 -25.82 179.33 600 4.3    13
## 195 -15.49 186.04   94 4.3    26
## 196 -24.12 180.08 493 4.3    21
## 197 -21.37 180.67 593 4.3    13
## 198 -24.20 179.20 530 4.3    12
## 199 -11.55 166.20   96 4.3    14
## 200 -23.54 180.04 564 4.3    15
## 201 -20.12 183.40 284 4.3    15
## 202 -19.66 184.31 170 4.3    15
## 203 -15.41 186.44   69 4.3    42
## 204 -19.90 178.90   81 4.3    11
## 205 -19.19 183.51 307 4.3    19
## 206 -21.30 180.82 624 4.3    14
## 207 -23.83 182.56 229 4.3    24
```

## 208	-24.81	180.00	452	4.3	19
## 209	-17.82	181.83	640	4.3	24
## 210	-24.60	183.50	67	4.3	25
## 211	-22.30	181.90	309	4.3	11
## 212	-20.41	181.74	538	4.3	31
## 213	-19.67	182.18	360	4.3	23
## 214	-21.97	182.32	261	4.3	13
## 215	-16.17	184.10	338	4.3	13
## 216	-23.55	180.27	535	4.3	22
## 217	-20.94	181.58	573	4.3	21
## 218	-24.64	180.81	397	4.3	24
## 219	-17.95	181.65	619	4.3	26
## 220	-24.78	179.22	492	4.3	16
## 221	-14.99	171.39	637	4.3	21
## 222	-27.54	182.50	68	4.3	12
## 223	-27.20	182.39	69	4.3	14
## 224	-27.71	182.47	103	4.3	11
## 225	-32.14	179.90	406	4.3	19
## 226	-20.36	186.16	102	4.3	21
## 227	-30.40	181.40	40	4.3	17
## 228	-17.95	181.50	593	4.3	16
## 229	-20.51	182.30	492	4.3	23
## 230	-25.04	180.10	481	4.3	15
## 231	-34.10	181.80	246	4.3	23
## 232	-24.19	180.38	484	4.3	27
## 233	-27.63	182.93	80	4.3	14
## 234	-12.66	166.37	165	4.3	18
## 235	-15.72	185.64	138	4.3	21
## 236	-26.46	182.50	184	4.3	11
## 237	-24.09	179.68	538	4.3	21
## 238	-23.19	182.80	237	4.3	18
## 239	-20.81	184.70	162	4.3	20
## 240	-16.95	185.94	95	4.3	12
## 241	-20.75	184.52	144	4.3	25
## 242	-20.66	185.77	69	4.3	25
## 243	-21.16	181.41	543	4.3	17
## 244	-20.65	182.22	506	4.3	24
## 245	-20.57	181.33	605	4.3	18
## 246	-20.95	181.06	611	4.3	20
## 247	-18.07	181.54	546	4.3	28
## 248	-20.08	183.22	294	4.3	18
## 249	-18.19	181.74	616	4.3	17
## 250	-17.96	181.40	655	4.3	20
## 251	-19.45	184.48	246	4.3	15
## 252	-20.97	181.72	487	4.3	16
## 253	-25.28	181.17	367	4.3	25
## 254	-20.70	184.30	182	4.3	17
## 255	-19.60	184.53	199	4.3	21
## 256	-21.63	180.77	592	4.3	21
## 257	-21.05	180.90	616	4.3	10
## 258	-20.40	186.10	74	4.3	22
## 259	-22.90	183.80	71	4.3	19

```
## 260 -18.11 181.63 568 4.3 36
## 261 -20.90 182.02 402 4.3 18
## 262 -23.73 183.00 118 4.3 11
## 263 -21.48 182.44 364 4.3 20
## 264 -30.01 181.15 210 4.3 17
## 265 -13.16 167.24 278 4.3 17
## 266 -18.94 182.43 566 4.3 20
## 267 -21.07 183.78 180 4.3 25
## 268 -19.17 169.53 268 4.3 21
## 269 -17.98 181.61 598 4.3 27
## 270 -20.83 181.01 622 4.3 15
## 271 -23.85 180.26 497 4.3 32
## 272 -12.57 166.72 137 4.3 20
## 273 -18.83 182.26 575 4.3 11
## 274 -27.99 183.50 71 4.3 22
## 275 -20.73 181.42 575 4.3 18
## 276 -15.45 181.42 409 4.3 27
## 277 -28.11 181.93 194 4.4 15
## 278 -21.44 180.69 583 4.4 13
## 279 -18.54 182.11 554 4.4 19
## 280 -21.00 181.66 600 4.4 10
## 281 -23.50 179.78 570 4.4 13
## 282 -22.63 180.31 598 4.4 18
## 283 -23.30 180.16 512 4.4 18
## 284 -19.84 182.37 328 4.4 17
## 285 -18.82 169.33 230 4.4 11
## 286 -24.97 179.82 511 4.4 23
## 287 -11.77 166.32 70 4.4 18
## 288 -19.85 182.13 562 4.4 31
## 289 -17.80 181.35 535 4.4 23
## 290 -17.70 181.23 546 4.4 35
## 291 -34.89 180.60 42 4.4 25
## 292 -26.20 178.35 606 4.4 21
## 293 -31.24 180.60 328 4.4 18
## 294 -29.91 181.43 205 4.4 34
## 295 -17.80 185.17 97 4.4 22
## 296 -19.88 184.30 161 4.4 17
## 297 -20.21 183.83 242 4.4 29
## 298 -16.00 182.82 431 4.4 16
## 299 -28.23 182.68 74 4.4 20
## 300 -29.10 182.10 179 4.4 19
## 301 -19.06 169.01 158 4.4 10
## 302 -17.88 181.47 562 4.4 27
## 303 -18.73 168.80 82 4.4 14
## 304 -19.76 181.41 105 4.4 15
## 305 -30.72 180.10 413 4.4 22
## 306 -17.95 184.68 260 4.4 21
## 307 -13.09 169.28 654 4.4 22
## 308 -17.40 181.02 479 4.4 14
## 309 -19.83 182.04 575 4.4 23
## 310 -29.50 182.31 129 4.4 14
## 311 -26.10 182.30 49 4.4 11
```

## 312	-27.33	182.60	42	4.4	11
## 313	-18.80	169.21	221	4.4	16
## 314	-20.31	184.06	249	4.4	21
## 315	-18.20	181.60	553	4.4	14
## 316	-13.47	167.14	226	4.4	26
## 317	-20.94	181.26	556	4.4	21
## 318	-15.70	184.50	118	4.4	30
## 319	-23.61	180.23	475	4.4	26
## 320	-21.50	185.20	139	4.4	15
## 321	-14.43	167.26	151	4.4	17
## 322	-32.70	181.70	211	4.4	40
## 323	-19.47	169.15	149	4.4	15
## 324	-21.80	183.20	325	4.4	19
## 325	-18.89	169.48	259	4.4	21
## 326	-15.66	186.80	45	4.4	11
## 327	-18.05	180.86	632	4.4	15
## 328	-20.90	181.90	556	4.4	17
## 329	-15.61	167.50	135	4.4	21
## 330	-17.68	181.11	568	4.4	22
## 331	-18.00	185.48	143	4.4	29
## 332	-19.60	185.20	125	4.4	13
## 333	-34.40	180.50	201	4.4	41
## 334	-15.90	185.30	57	4.4	19
## 335	-13.07	166.87	132	4.4	24
## 336	-11.76	165.96	45	4.4	51
## 337	-19.50	186.90	58	4.4	20
## 338	-15.26	183.13	393	4.4	28
## 339	-18.18	182.04	609	4.4	26
## 340	-24.96	179.87	480	4.4	25
## 341	-21.58	181.90	409	4.4	19
## 342	-22.00	185.50	52	4.4	18
## 343	-30.09	182.40	51	4.4	18
## 344	-12.85	165.67	75	4.4	30
## 345	-28.56	183.59	53	4.4	20
## 346	-15.48	186.73	82	4.4	17
## 347	-23.10	180.12	533	4.4	27
## 348	-15.85	184.83	299	4.4	30
## 349	-18.60	184.28	255	4.4	31
## 350	-20.16	184.27	210	4.4	27
## 351	-15.35	186.40	98	4.4	17
## 352	-25.23	179.86	476	4.4	29
## 353	-23.90	179.90	579	4.4	16
## 354	-21.56	183.23	271	4.4	36
## 355	-13.36	172.76	618	4.4	18
## 356	-18.76	169.71	287	4.4	23
## 357	-21.26	181.69	487	4.4	20
## 358	-30.51	181.30	203	4.4	20
## 359	-12.16	167.03	264	4.4	14
## 360	-19.85	184.51	184	4.4	26
## 361	-21.80	183.60	213	4.4	17
## 362	-20.74	180.70	589	4.4	27
## 363	-18.91	169.46	248	4.4	33

## 364	-12.93	169.52	663	4.4	30
## 365	-18.54	168.93	100	4.4	17
## 366	-15.50	185.30	93	4.4	25
## 367	-15.67	185.23	66	4.4	34
## 368	-15.80	185.25	82	4.4	39
## 369	-22.09	180.58	580	4.4	22
## 370	-18.10	181.63	592	4.4	28
## 371	-23.87	180.15	524	4.4	22
## 372	-15.28	185.98	162	4.4	36
## 373	-20.27	181.51	609	4.4	32
## 374	-25.79	182.38	172	4.4	14
## 375	-20.77	183.71	251	4.4	47
## 376	-28.10	183.50	42	4.4	17
## 377	-25.93	179.54	470	4.4	22
## 378	-17.83	181.50	590	4.5	21
## 379	-20.84	181.16	576	4.5	17
## 380	-20.97	181.47	582	4.5	25
## 381	-16.30	186.00	48	4.5	10
## 382	-18.73	169.23	206	4.5	17
## 383	-26.40	181.70	329	4.5	24
## 384	-22.70	181.00	445	4.5	17
## 385	-20.42	181.86	530	4.5	27
## 386	-19.86	184.35	201	4.5	30
## 387	-12.11	167.06	265	4.5	23
## 388	-23.84	180.99	367	4.5	27
## 389	-23.64	179.96	538	4.5	26
## 390	-27.24	181.11	365	4.5	21
## 391	-15.75	185.23	280	4.5	28
## 392	-19.22	182.43	571	4.5	23
## 393	-17.43	185.43	189	4.5	22
## 394	-19.52	168.98	63	4.5	21
## 395	-18.89	169.42	239	4.5	27
## 396	-17.42	185.16	206	4.5	22
## 397	-18.04	181.75	640	4.5	47
## 398	-24.00	182.75	175	4.5	14
## 399	-26.72	183.35	190	4.5	36
## 400	-12.95	169.09	629	4.5	19
## 401	-20.32	181.69	508	4.5	14
## 402	-23.77	180.16	505	4.5	26
## 403	-16.24	185.75	154	4.5	22
## 404	-23.84	180.13	525	4.5	15
## 405	-20.08	182.74	298	4.5	33
## 406	-14.85	167.24	97	4.5	26
## 407	-21.29	180.85	607	4.5	23
## 408	-22.00	180.52	561	4.5	19
## 409	-18.07	181.57	572	4.5	26
## 410	-21.34	181.41	464	4.5	21
## 411	-26.16	179.50	492	4.5	25
## 412	-23.91	180.00	534	4.5	11
## 413	-27.18	182.18	56	4.5	14
## 414	-25.80	182.10	68	4.5	26
## 415	-27.27	182.38	45	4.5	16

## 416	-27.27	182.50	51	4.5	13
## 417	-27.38	182.39	69	4.5	12
## 418	-18.30	183.20	103	4.5	14
## 419	-27.23	180.98	401	4.5	39
## 420	-17.68	186.80	112	4.5	35
## 421	-26.60	182.77	119	4.5	29
## 422	-20.30	182.30	476	4.5	10
## 423	-20.56	182.04	499	4.5	29
## 424	-25.31	180.15	467	4.5	25
## 425	-18.06	181.59	604	4.5	23
## 426	-19.00	185.60	107	4.5	15
## 427	-20.83	185.90	104	4.5	19
## 428	-23.56	180.23	474	4.5	13
## 429	-21.39	180.68	617	4.5	18
## 430	-30.24	181.63	80	4.5	17
## 431	-21.06	183.81	203	4.5	34
## 432	-12.08	165.76	63	4.5	51
## 433	-15.43	167.38	137	4.5	16
## 434	-21.31	180.84	586	4.5	17
## 435	-15.86	166.85	85	4.5	22
## 436	-16.20	166.80	98	4.5	21
## 437	-13.56	166.49	83	4.5	25
## 438	-27.75	182.26	174	4.5	18
## 439	-19.60	183.84	309	4.5	23
## 440	-17.02	182.41	420	4.5	29
## 441	-16.49	187.80	40	4.5	18
## 442	-20.49	181.69	559	4.5	24
## 443	-23.97	179.91	518	4.5	23
## 444	-21.30	180.92	617	4.5	26
## 445	-16.23	167.91	182	4.5	28
## 446	-17.94	180.60	627	4.5	29
## 447	-19.34	182.62	573	4.5	32
## 448	-20.74	181.53	598	4.5	36
## 449	-25.00	180.00	488	4.5	10
## 450	-16.11	187.48	61	4.5	19
## 451	-16.31	168.08	204	4.5	16
## 452	-19.28	182.78	348	4.5	30
## 453	-14.57	167.24	162	4.5	18
## 454	-22.06	183.95	134	4.5	17
## 455	-22.14	180.64	591	4.5	18
## 456	-24.41	180.03	500	4.5	34
## 457	-21.18	180.92	619	4.5	18
## 458	-12.27	167.41	50	4.5	29
## 459	-22.26	171.44	83	4.5	25
## 460	-21.56	185.50	47	4.5	29
## 461	-31.80	180.60	178	4.5	19
## 462	-20.45	182.10	500	4.5	37
## 463	-23.42	180.21	510	4.5	37
## 464	-23.20	184.80	97	4.5	13
## 465	-21.14	181.06	625	4.5	35
## 466	-15.83	167.10	43	4.5	19
## 467	-15.39	185.10	237	4.5	39

## 468	-25.46	179.98	479	4.5	27
## 469	-17.90	181.41	586	4.5	33
## 470	-11.38	167.05	133	4.5	32
## 471	-21.91	181.28	548	4.5	30
## 472	-24.39	178.98	562	4.5	30
## 473	-22.20	180.58	594	4.5	45
## 474	-32.14	180.00	331	4.5	27
## 475	-20.18	181.62	558	4.5	31
## 476	-20.99	181.02	626	4.5	36
## 477	-17.63	185.13	219	4.5	28
## 478	-17.93	181.62	561	4.5	32
## 479	-18.68	184.50	174	4.5	34
## 480	-20.97	181.20	605	4.5	31
## 481	-23.90	184.60	41	4.5	22
## 482	-15.54	187.15	60	4.5	17
## 483	-20.13	184.20	244	4.5	34
## 484	-17.40	187.80	40	4.5	14
## 485	-12.26	167.00	249	4.6	16
## 486	-14.72	167.51	155	4.6	18
## 487	-22.58	179.24	553	4.6	21
## 488	-17.64	181.28	574	4.6	17
## 489	-15.31	186.10	96	4.6	32
## 490	-19.23	169.41	246	4.6	27
## 491	-22.75	173.20	46	4.6	26
## 492	-11.49	166.22	84	4.6	32
## 493	-19.57	182.38	579	4.6	38
## 494	-26.20	178.41	583	4.6	25
## 495	-21.33	180.69	636	4.6	29
## 496	-20.24	169.49	100	4.6	22
## 497	-23.71	180.30	510	4.6	30
## 498	-23.95	182.80	199	4.6	14
## 499	-12.66	169.46	658	4.6	43
## 500	-11.34	166.24	103	4.6	30
## 501	-13.86	167.16	202	4.6	30
## 502	-35.56	180.20	42	4.6	32
## 503	-25.68	180.34	434	4.6	41
## 504	-15.02	184.24	339	4.6	27
## 505	-24.27	179.88	523	4.6	24
## 506	-15.85	185.13	290	4.6	29
## 507	-17.87	182.00	569	4.6	12
## 508	-32.20	179.61	422	4.6	41
## 509	-23.85	182.53	204	4.6	27
## 510	-18.13	181.52	618	4.6	41
## 511	-22.36	171.65	130	4.6	39
## 512	-18.11	181.67	597	4.6	28
## 513	-16.09	184.89	304	4.6	34
## 514	-14.95	167.24	130	4.6	16
## 515	-20.21	182.37	482	4.6	37
## 516	-17.44	181.40	529	4.6	25
## 517	-16.45	177.77	138	4.6	17
## 518	-20.92	181.50	546	4.6	31
## 519	-25.31	179.69	507	4.6	35

## 520	-18.64	169.32	260	4.6	23
## 521	-21.09	181.38	555	4.6	15
## 522	-21.38	181.39	501	4.6	36
## 523	-10.78	165.77	93	4.6	20
## 524	-20.76	185.77	118	4.6	15
## 525	-27.60	182.40	61	4.6	11
## 526	-27.21	182.43	55	4.6	10
## 527	-28.96	182.61	54	4.6	15
## 528	-27.18	182.53	60	4.6	21
## 529	-26.78	183.61	40	4.6	22
## 530	-15.29	186.42	153	4.6	31
## 531	-11.63	166.14	109	4.6	36
## 532	-33.00	182.40	176	4.6	28
## 533	-20.61	182.60	488	4.6	12
## 534	-19.83	182.54	524	4.6	14
## 535	-15.03	167.32	136	4.6	20
## 536	-18.18	180.63	639	4.6	39
## 537	-32.90	181.60	169	4.6	27
## 538	-29.09	183.20	54	4.6	23
## 539	-13.84	170.62	638	4.6	20
## 540	-20.10	186.30	63	4.6	19
## 541	-23.46	180.09	543	4.6	28
## 542	-23.46	180.17	541	4.6	32
## 543	-11.67	166.02	102	4.6	21
## 544	-15.44	167.18	140	4.6	44
## 545	-15.79	166.83	45	4.6	39
## 546	-16.28	166.94	50	4.6	24
## 547	-17.56	181.59	543	4.6	34
## 548	-16.45	167.54	125	4.6	18
## 549	-19.61	181.91	590	4.6	34
## 550	-22.06	180.47	587	4.6	28
## 551	-17.74	181.31	575	4.6	42
## 552	-20.89	181.25	599	4.6	20
## 553	-20.09	168.75	50	4.6	23
## 554	-20.95	181.42	559	4.6	27
## 555	-20.48	169.76	134	4.6	33
## 556	-28.10	182.25	68	4.6	18
## 557	-21.24	180.81	605	4.6	34
## 558	-33.03	180.20	186	4.6	27
## 559	-23.93	180.18	525	4.6	31
## 560	-21.23	181.09	613	4.6	18
## 561	-20.72	181.41	595	4.6	36
## 562	-38.46	176.03	148	4.6	44
## 563	-22.87	171.72	47	4.6	27
## 564	-27.60	182.10	154	4.6	22
## 565	-18.12	181.71	594	4.6	24
## 566	-15.97	186.08	143	4.6	41
## 567	-25.48	180.94	390	4.6	33
## 568	-23.73	179.98	524	4.6	11
## 569	-22.16	180.49	586	4.6	13
## 570	-20.30	181.40	608	4.6	13
## 571	-20.63	181.61	599	4.6	30

## 572	-22.10	185.30	50	4.6	22
## 573	-22.55	183.34	66	4.6	18
## 574	-25.04	179.84	474	4.6	32
## 575	-21.85	180.89	577	4.6	43
## 576	-18.10	181.72	544	4.6	52
## 577	-21.75	180.67	595	4.6	30
## 578	-21.78	183.11	225	4.6	21
## 579	-19.64	169.50	204	4.6	35
## 580	-23.39	179.97	541	4.6	50
## 581	-22.33	171.51	112	4.6	14
## 582	-23.92	180.21	524	4.6	50
## 583	-20.88	185.18	51	4.6	28
## 584	-19.94	182.39	544	4.6	30
## 585	-30.39	182.40	63	4.6	22
## 586	-28.74	181.74	211	4.7	35
## 587	-30.20	182.00	125	4.7	22
## 588	-16.32	166.74	50	4.7	30
## 589	-37.37	176.78	263	4.7	34
## 590	-20.69	181.55	582	4.7	35
## 591	-17.10	184.93	286	4.7	25
## 592	-21.50	170.50	117	4.7	32
## 593	-13.36	167.06	236	4.7	22
## 594	-24.57	179.92	484	4.7	33
## 595	-21.88	180.39	608	4.7	30
## 596	-33.00	181.60	72	4.7	22
## 597	-13.47	172.29	64	4.7	14
## 598	-22.05	180.40	606	4.7	27
## 599	-16.24	168.02	53	4.7	12
## 600	-15.54	167.68	140	4.7	16
## 601	-20.65	181.32	597	4.7	39
## 602	-23.43	180.00	553	4.7	41
## 603	-18.56	169.31	223	4.7	35
## 604	-16.23	183.59	367	4.7	35
## 605	-30.28	180.62	350	4.7	32
## 606	-30.66	180.13	411	4.7	42
## 607	-16.52	185.70	90	4.7	30
## 608	-19.40	180.94	664	4.7	34
## 609	-13.44	166.53	44	4.7	27
## 610	-15.50	186.90	46	4.7	18
## 611	-10.97	166.26	180	4.7	26
## 612	-19.18	169.33	254	4.7	35
## 613	-20.90	181.51	548	4.7	32
## 614	-24.40	179.85	522	4.7	29
## 615	-21.13	185.32	123	4.7	36
## 616	-16.44	185.74	126	4.7	30
## 617	-23.30	179.70	500	4.7	29
## 618	-27.10	182.18	43	4.7	17
## 619	-27.27	182.36	65	4.7	21
## 620	-11.64	166.47	130	4.7	19
## 621	-30.80	182.16	41	4.7	24
## 622	-15.36	167.51	123	4.7	28
## 623	-32.60	180.90	57	4.7	44

## 624	-20.58	181.24	602	4.7	44
## 625	-23.33	180.26	530	4.7	22
## 626	-16.10	185.32	257	4.7	30
## 627	-21.05	184.68	136	4.7	29
## 628	-22.28	183.52	90	4.7	19
## 629	-16.96	167.70	45	4.7	23
## 630	-31.94	180.57	168	4.7	39
## 631	-19.14	184.36	269	4.7	31
## 632	-11.81	165.98	51	4.7	28
## 633	-26.54	183.63	66	4.7	34
## 634	-16.99	187.00	70	4.7	30
## 635	-15.17	187.20	50	4.7	28
## 636	-26.18	179.79	460	4.7	44
## 637	-24.68	183.33	70	4.7	30
## 638	-33.57	180.80	51	4.7	35
## 639	-16.10	167.25	68	4.7	36
## 640	-17.70	181.31	549	4.7	33
## 641	-15.08	166.62	42	4.7	23
## 642	-23.28	184.61	76	4.7	36
## 643	-23.92	184.47	40	4.7	17
## 644	-20.04	181.87	577	4.7	19
## 645	-13.62	167.15	209	4.7	30
## 646	-23.89	182.39	243	4.7	32
## 647	-23.07	184.03	89	4.7	32
## 648	-32.82	179.80	176	4.7	26
## 649	-17.99	168.98	234	4.7	28
## 650	-33.29	181.30	60	4.7	33
## 651	-34.63	179.10	278	4.7	24
## 652	-34.12	181.75	75	4.7	41
## 653	-20.81	185.01	79	4.7	42
## 654	-14.28	170.34	642	4.7	29
## 655	-23.11	179.15	564	4.7	17
## 656	-15.45	186.73	83	4.7	37
## 657	-18.35	185.27	201	4.7	57
## 658	-22.42	171.40	86	4.7	33
## 659	-23.50	180.00	550	4.7	23
## 660	-17.97	181.48	578	4.7	43
## 661	-26.02	181.20	361	4.7	32
## 662	-15.40	186.87	78	4.7	44
## 663	-38.59	175.70	162	4.7	36
## 664	-11.37	166.55	188	4.7	24
## 665	-22.33	171.46	119	4.7	32
## 666	-27.87	183.40	87	4.7	34
## 667	-20.07	181.75	582	4.7	27
## 668	-19.36	186.36	100	4.7	40
## 669	-17.38	168.63	209	4.7	29
## 670	-13.79	166.56	68	4.7	41
## 671	-14.82	171.17	658	4.7	49
## 672	-21.40	180.78	615	4.7	51
## 673	-23.08	183.45	90	4.7	30
## 674	-25.81	182.54	201	4.7	40
## 675	-17.95	181.73	583	4.7	57

## 676	-23.50	184.90	61	4.7	16
## 677	-23.73	184.49	60	4.7	35
## 678	-27.08	183.44	63	4.7	27
## 679	-21.71	183.58	234	4.7	55
## 680	-24.10	184.50	68	4.7	23
## 681	-22.95	170.56	42	4.7	21
## 682	-16.00	184.53	108	4.7	33
## 683	-12.28	167.06	248	4.7	35
## 684	-20.42	181.62	562	4.8	41
## 685	-11.70	166.10	82	4.8	43
## 686	-15.55	185.05	292	4.8	42
## 687	-26.11	178.30	617	4.8	39
## 688	-14.60	167.40	178	4.8	52
## 689	-14.65	166.97	82	4.8	28
## 690	-27.72	181.70	94	4.8	59
## 691	-24.34	179.52	504	4.8	34
## 692	-35.48	179.90	59	4.8	35
## 693	-24.96	180.22	470	4.8	41
## 694	-18.20	183.68	107	4.8	52
## 695	-13.34	166.20	67	4.8	18
## 696	-19.68	184.14	242	4.8	40
## 697	-32.62	181.50	55	4.8	26
## 698	-14.82	167.32	123	4.8	28
## 699	-27.38	181.70	80	4.8	13
## 700	-27.17	183.68	44	4.8	27
## 701	-22.24	184.56	99	4.8	57
## 702	-20.07	169.14	66	4.8	37
## 703	-19.70	186.20	47	4.8	19
## 704	-26.16	178.47	537	4.8	33
## 705	-17.97	168.52	146	4.8	33
## 706	-16.03	185.43	297	4.8	25
## 707	-18.49	169.04	211	4.8	30
## 708	-30.04	181.20	49	4.8	20
## 709	-18.89	184.46	242	4.8	36
## 710	-23.28	184.60	44	4.8	34
## 711	-15.71	166.91	58	4.8	20
## 712	-20.33	168.71	40	4.8	38
## 713	-23.44	184.60	63	4.8	27
## 714	-18.85	187.55	44	4.8	35
## 715	-15.90	167.16	41	4.8	42
## 716	-16.62	186.74	82	4.8	51
## 717	-12.72	166.28	70	4.8	47
## 718	-24.50	180.92	377	4.8	43
## 719	-22.75	170.99	67	4.8	35
## 720	-17.78	181.53	511	4.8	56
## 721	-18.48	182.37	376	4.8	57
## 722	-28.56	183.47	48	4.8	56
## 723	-23.29	184.00	164	4.8	50
## 724	-18.17	181.98	651	4.8	43
## 725	-30.01	180.80	286	4.8	43
## 726	-18.26	180.98	631	4.8	36
## 727	-23.82	180.09	498	4.8	40

## 728	-24.97	182.85	137	4.8	40
## 729	-23.47	180.24	511	4.8	37
## 730	-14.30	167.32	208	4.8	25
## 731	-21.22	181.51	524	4.8	49
## 732	-16.21	186.52	111	4.8	30
## 733	-13.40	166.90	228	4.8	15
## 734	-24.33	179.97	510	4.8	44
## 735	-17.99	181.62	574	4.8	38
## 736	-25.63	180.26	464	4.8	60
## 737	-18.78	186.72	68	4.8	48
## 738	-12.01	166.66	99	4.8	36
## 739	-19.10	169.63	266	4.8	31
## 740	-22.03	179.77	587	4.8	31
## 741	-12.57	167.11	231	4.8	28
## 742	-14.10	166.01	69	4.8	29
## 743	-27.84	182.10	193	4.8	27
## 744	-23.70	184.13	51	4.8	27
## 745	-15.78	167.44	40	4.8	42
## 746	-23.50	180.13	512	4.8	40
## 747	-15.86	166.98	60	4.8	25
## 748	-22.70	170.30	69	4.8	27
## 749	-30.10	182.30	56	4.9	34
## 750	-20.68	181.41	593	4.9	40
## 751	-25.20	182.60	149	4.9	31
## 752	-21.27	173.49	48	4.9	42
## 753	-20.90	169.84	93	4.9	31
## 754	-17.67	187.09	45	4.9	62
## 755	-19.85	181.85	576	4.9	54
## 756	-22.43	184.48	65	4.9	48
## 757	-13.65	166.66	71	4.9	52
## 758	-19.62	185.35	57	4.9	31
## 759	-22.50	170.40	106	4.9	38
## 760	-23.79	179.89	526	4.9	43
## 761	-26.17	184.20	65	4.9	37
## 762	-22.09	180.38	590	4.9	35
## 763	-22.00	180.53	583	4.9	20
## 764	-13.05	169.58	644	4.9	68
## 765	-21.48	183.78	200	4.9	54
## 766	-12.59	167.10	325	4.9	26
## 767	-12.49	166.36	74	4.9	55
## 768	-12.01	166.29	59	4.9	27
## 769	-27.00	183.88	56	4.9	36
## 770	-21.04	181.20	591	4.9	45
## 771	-32.42	181.21	47	4.9	39
## 772	-21.07	181.13	594	4.9	43
## 773	-16.51	187.10	62	4.9	46
## 774	-25.59	180.02	485	4.9	48
## 775	-17.99	181.57	579	4.9	49
## 776	-30.69	182.10	62	4.9	25
## 777	-12.84	166.78	150	4.9	35
## 778	-21.24	180.86	615	4.9	23
## 779	-21.57	185.62	66	4.9	38

## 780	-22.04	184.91	47	4.9	47
## 781	-22.37	171.50	116	4.9	38
## 782	-19.19	182.30	390	4.9	48
## 783	-10.78	166.10	195	4.9	45
## 784	-20.54	181.66	559	4.9	50
## 785	-21.47	185.86	55	4.9	46
## 786	-26.53	178.30	605	4.9	43
## 787	-20.64	169.66	89	4.9	42
## 788	-26.00	178.43	644	4.9	27
## 789	-21.08	181.30	557	4.9	78
## 790	-24.97	179.54	505	4.9	50
## 791	-11.02	167.01	62	4.9	36
## 792	-21.29	185.80	69	4.9	74
## 793	-15.24	185.11	262	4.9	56
## 794	-33.09	180.94	47	4.9	47
## 795	-10.96	165.97	76	4.9	64
## 796	-14.86	167.32	137	4.9	22
## 797	-20.88	184.95	82	4.9	50
## 798	-18.56	169.05	217	4.9	35
## 799	-23.30	184.68	102	4.9	27
## 800	-23.00	170.70	43	4.9	20
## 801	-28.22	183.60	75	4.9	49
## 802	-20.05	183.86	243	4.9	65
## 803	-13.82	172.38	613	5.0	61
## 804	-21.96	179.62	627	5.0	45
## 805	-36.95	177.81	146	5.0	35
## 806	-26.53	178.57	600	5.0	69
## 807	-13.23	167.10	220	5.0	46
## 808	-34.20	179.43	40	5.0	37
## 809	-22.64	180.64	544	5.0	50
## 810	-23.73	182.53	232	5.0	55
## 811	-22.34	171.52	106	5.0	43
## 812	-21.68	180.63	617	5.0	63
## 813	-16.65	185.51	218	5.0	52
## 814	-23.33	180.18	528	5.0	59
## 815	-20.60	182.28	529	5.0	50
## 816	-18.48	181.49	641	5.0	49
## 817	-15.24	186.21	158	5.0	57
## 818	-16.40	185.86	148	5.0	47
## 819	-12.25	166.60	219	5.0	28
## 820	-21.54	185.48	51	5.0	29
## 821	-17.79	181.32	587	5.0	49
## 822	-25.50	182.82	124	5.0	25
## 823	-14.32	167.33	204	5.0	49
## 824	-15.87	188.13	52	5.0	30
## 825	-18.00	180.62	636	5.0	100
## 826	-10.79	166.06	142	5.0	40
## 827	-15.61	187.15	49	5.0	30
## 828	-20.41	186.51	63	5.0	28
## 829	-12.05	167.39	332	5.0	36
## 830	-28.15	183.40	57	5.0	32
## 831	-23.46	180.11	539	5.0	41

## 832	-20.93	181.54	564	5.0	64
## 833	-18.07	181.58	603	5.0	65
## 834	-18.04	181.57	587	5.0	51
## 835	-26.50	178.29	609	5.0	50
## 836	-19.30	183.00	302	5.0	65
## 837	-24.04	184.85	70	5.0	48
## 838	-23.61	180.27	537	5.0	63
## 839	-21.19	181.58	490	5.0	77
## 840	-23.80	184.70	42	5.0	36
## 841	-18.97	169.44	242	5.0	41
## 842	-25.42	182.65	102	5.0	36
## 843	-22.23	180.48	581	5.0	54
## 844	-12.00	166.20	94	5.0	31
## 845	-21.35	170.04	56	5.0	22
## 846	-22.82	184.52	49	5.0	52
## 847	-19.30	185.86	48	5.0	40
## 848	-20.56	184.41	138	5.0	82
## 849	-20.82	181.67	577	5.0	67
## 850	-18.97	185.25	129	5.1	73
## 851	-15.48	167.53	128	5.1	61
## 852	-13.66	166.54	50	5.1	45
## 853	-17.93	167.89	49	5.1	43
## 854	-16.14	187.32	42	5.1	68
## 855	-17.80	181.38	587	5.1	47
## 856	-19.02	184.23	270	5.1	72
## 857	-12.93	169.63	641	5.1	57
## 858	-23.49	179.07	544	5.1	58
## 859	-22.19	171.40	150	5.1	49
## 860	-20.43	182.37	502	5.1	48
## 861	-23.73	179.99	527	5.1	49
## 862	-17.59	181.09	536	5.1	61
## 863	-19.77	181.40	630	5.1	54
## 864	-15.36	186.66	112	5.1	57
## 865	-16.24	167.95	188	5.1	68
## 866	-20.04	182.01	605	5.1	49
## 867	-28.83	181.66	221	5.1	63
## 868	-14.28	167.26	211	5.1	51
## 869	-22.10	179.71	579	5.1	58
## 870	-22.55	183.81	82	5.1	68
## 871	-20.85	181.59	499	5.1	91
## 872	-29.90	181.16	215	5.1	51
## 873	-13.26	167.01	213	5.1	70
## 874	-27.28	183.40	70	5.1	54
## 875	-11.25	166.36	130	5.1	55
## 876	-23.31	179.27	566	5.1	49
## 877	-15.65	186.26	64	5.1	54
## 878	-20.06	168.69	49	5.1	49
## 879	-23.78	180.31	518	5.1	71
## 880	-22.87	172.65	56	5.1	50
## 881	-17.59	180.98	548	5.1	79
## 882	-17.74	186.78	104	5.1	71
## 883	-21.44	170.45	166	5.1	22

## 884	-12.34	167.43	50	5.1	47
## 885	-21.57	183.86	156	5.1	70
## 886	-20.24	185.10	86	5.1	61
## 887	-15.00	184.62	40	5.1	54
## 888	-20.89	185.26	54	5.1	44
## 889	-21.55	181.39	513	5.1	81
## 890	-28.05	182.39	117	5.1	43
## 891	-21.52	169.75	61	5.1	40
## 892	-27.64	182.22	162	5.1	67
## 893	-16.46	180.79	498	5.2	79
## 894	-23.74	179.99	506	5.2	75
## 895	-34.02	180.21	75	5.2	65
## 896	-20.64	182.02	497	5.2	64
## 897	-18.16	183.41	306	5.2	54
## 898	-17.72	180.30	595	5.2	74
## 899	-21.96	180.54	603	5.2	66
## 900	-19.13	182.51	579	5.2	56
## 901	-21.79	183.48	210	5.2	69
## 902	-18.08	180.70	628	5.2	72
## 903	-23.58	183.40	94	5.2	79
## 904	-17.71	181.18	574	5.2	67
## 905	-14.46	167.26	195	5.2	87
## 906	-18.51	182.64	405	5.2	74
## 907	-27.98	181.96	53	5.2	89
## 908	-18.21	180.87	631	5.2	69
## 909	-18.80	182.41	385	5.2	67
## 910	-17.64	177.01	545	5.2	91
## 911	-17.98	181.51	586	5.2	68
## 912	-19.02	186.83	45	5.2	65
## 913	-31.03	181.59	57	5.2	49
## 914	-19.34	186.59	56	5.2	49
## 915	-21.60	169.90	43	5.2	56
## 916	-15.18	167.23	71	5.2	59
## 917	-26.72	182.69	162	5.2	64
## 918	-21.53	170.52	129	5.2	30
## 919	-22.41	183.99	128	5.2	72
## 920	-23.75	184.50	54	5.2	74
## 921	-22.33	171.66	125	5.2	51
## 922	-28.98	181.11	304	5.3	60
## 923	-13.66	172.23	46	5.3	67
## 924	-23.58	180.17	462	5.3	63
## 925	-19.89	183.84	244	5.3	73
## 926	-20.02	184.09	234	5.3	71
## 927	-14.70	166.00	48	5.3	16
## 928	-23.36	180.01	553	5.3	61
## 929	-18.77	169.24	218	5.3	53
## 930	-11.41	166.24	83	5.3	55
## 931	-19.10	183.87	61	5.3	42
## 932	-17.72	181.42	565	5.3	89
## 933	-13.45	170.30	641	5.3	93
## 934	-21.92	182.80	273	5.3	78
## 935	-24.18	179.02	550	5.3	86

## 936	-15.34	167.10	128	5.3	18
## 937	-18.92	169.37	248	5.3	60
## 938	-21.29	185.77	57	5.3	69
## 939	-21.13	185.60	85	5.3	86
## 940	-13.70	166.75	46	5.3	71
## 941	-14.12	166.64	63	5.3	69
## 942	-15.99	167.95	190	5.3	81
## 943	-26.00	184.10	42	5.4	43
## 944	-19.66	180.28	431	5.4	57
## 945	-20.47	185.68	93	5.4	85
## 946	-18.60	181.91	442	5.4	82
## 947	-27.19	182.18	69	5.4	68
## 948	-21.98	179.60	583	5.4	67
## 949	-19.89	184.08	219	5.4	105
## 950	-26.18	178.59	548	5.4	65
## 951	-23.53	179.99	538	5.4	87
## 952	-37.93	177.47	65	5.4	65
## 953	-15.95	167.34	47	5.4	87
## 954	-11.54	166.18	89	5.4	80
## 955	-18.12	181.88	649	5.4	88
## 956	-17.10	185.90	127	5.4	75
## 957	-38.28	177.10	100	5.4	71
## 958	-29.33	182.72	57	5.4	61
## 959	-19.33	186.16	44	5.4	110
## 960	-23.60	183.99	118	5.4	88
## 961	-22.04	183.95	109	5.4	61
## 962	-23.95	184.64	43	5.4	45
## 963	-15.46	187.81	40	5.5	91
## 964	-30.17	182.02	56	5.5	68
## 965	-17.10	182.68	403	5.5	82
## 966	-15.36	186.71	130	5.5	95
## 967	-21.11	181.50	538	5.5	104
## 968	-22.54	172.91	54	5.5	71
## 969	-20.90	184.28	58	5.5	92
## 970	-32.45	181.15	41	5.5	81
## 971	-15.77	167.01	64	5.5	73
## 972	-15.90	167.42	40	5.5	86
## 973	-18.14	180.87	624	5.5	105
## 974	-13.80	166.53	42	5.5	70
## 975	-27.89	182.92	87	5.5	67
## 976	-35.94	178.52	138	5.5	78
## 977	-26.00	182.12	205	5.6	98
## 978	-24.57	178.40	562	5.6	80
## 979	-34.68	179.82	75	5.6	79
## 980	-18.82	182.21	417	5.6	129
## 981	-37.03	177.52	153	5.6	87
## 982	-11.40	166.07	93	5.6	94
## 983	-15.93	167.91	183	5.6	109
## 984	-17.85	181.44	589	5.6	115
## 985	-20.25	184.75	107	5.6	121
## 986	-22.55	185.90	42	5.7	76
## 987	-23.34	184.50	56	5.7	106

```
## 988 -32.22 180.20 216 5.7    90
## 989 -22.13 180.38 577 5.7    104
## 990 -15.33 186.75 48 5.7    123
## 991 -17.84 181.30 535 5.7    112
## 992 -19.89 174.46 546 5.7    99
## 993 -21.14 174.21 40 5.7    78
## 994 -22.91 183.95 64 5.9    118
## 995 -21.08 180.85 627 5.9    119
## 996 -13.64 165.96 50 6.0    83
## 997 -12.23 167.02 242 6.0    132
## 998 -21.59 170.56 165 6.0    119
## 999 -20.70 169.92 139 6.1    94
## 1000 -15.56 167.62 127 6.4   122
```

Arrange function helps to reorder the rows just like sort. If the column is numeric it will sort from smaller to bigger number, if the column is character, then it will arrange in alphabetical order.

G. Now create a second sorted dataframe called **quakeSorted2** using the **order()** function. Explain in a comment how the function works.

```
indexes <- order(myQuakes[, "mag"])
quakeSortedDF2 <- myQuakes[indexes, ]
quakeSortedDF2
```

```
##      lat   long depth mag stations
## 5    -20.42 181.96  649 4.0     11
## 6    -19.68 184.31  195 4.0     12
## 26   -17.94 181.49  537 4.0     15
## 34   -23.55 180.80  349 4.0     10
## 52   -19.26 184.42  223 4.0     15
## 58   -22.06 180.60  584 4.0     11
## 71   -15.31 185.80  152 4.0     11
## 85   -17.70 181.70  450 4.0     11
## 96   -19.73 182.40  375 4.0     18
## 113  -19.06 182.45  477 4.0     16
## 142  -20.65 181.40  582 4.0     14
## 150  -17.90 181.50  573 4.0     19
## 202  -17.70 182.20  445 4.0     12
## 236  -23.54 179.93  574 4.0     12
## 284  -17.70 185.00  383 4.0     10
## 298  -17.94 181.51  601 4.0     16
## 299  -30.64 181.20  175 4.0     16
## 362  -16.90 185.72  135 4.0     22
## 389  -10.72 165.99  195 4.0     14
## 433  -18.55 182.23  563 4.0     17
## 483  -22.70 183.30  180 4.0     13
## 533  -21.00 183.20  296 4.0     16
## 598  -17.02 182.93  406 4.0     17
## 637  -19.51 183.97  280 4.0     16
## 698  -15.43 185.19  249 4.0     11
## 722  -17.91 181.48  555 4.0     17
## 727  -17.10 182.80  390 4.0     14
## 733  -30.30 180.80  275 4.0     14
## 750  -25.60 180.30  440 4.0     12
## 770  -20.70 186.30  80  4.0     10
## 772  -16.40 182.73  391 4.0     16
## 775  -21.60 180.50  595 4.0     22
## 780  -17.90 181.50  589 4.0     12
## 794  -28.00 182.00  199 4.0     16
## 816  -22.12 180.49  532 4.0     14
## 826  -21.62 182.40  350 4.0     12
## 834  -19.70 182.44  397 4.0     12
## 856  -18.50 185.40  243 4.0     11
## 861  -21.03 180.78  638 4.0     14
## 875  -17.80 181.20  530 4.0     15
## 900  -17.82 181.27  538 4.0     33
## 919  -25.06 182.80  133 4.0     14
## 937  -18.14 181.71  574 4.0     20
## 955  -23.49 180.06  530 4.0     23
## 989  -17.86 181.30  614 4.0     12
## 994  -17.95 181.37  642 4.0     17
## 4    -17.97 181.66  626 4.1     19
## 39   -17.66 181.40  585 4.1     17
## 62   -21.16 182.40  260 4.1     12
## 67   -20.14 181.60  587 4.1     13
## 77   -19.21 184.70  197 4.1     11
```

## 101	-16.98	185.61	108	4.1	12
## 161	-17.98	180.50	626	4.1	19
## 173	-20.20	180.90	627	4.1	11
## 174	-15.20	184.68	99	4.1	14
## 175	-15.03	182.29	399	4.1	10
## 179	-17.84	181.48	542	4.1	20
## 185	-20.45	181.85	534	4.1	14
## 194	-24.08	179.50	605	4.1	21
## 213	-28.25	181.71	226	4.1	19
## 242	-24.36	182.84	148	4.1	16
## 273	-23.80	179.90	498	4.1	12
## 307	-17.68	181.36	515	4.1	19
## 317	-17.32	181.03	497	4.1	13
## 353	-17.46	181.32	573	4.1	17
## 370	-23.44	182.93	158	4.1	20
## 423	-17.04	186.80	70	4.1	22
## 431	-18.40	183.40	343	4.1	10
## 482	-14.85	184.87	294	4.1	10
## 485	-17.90	181.30	593	4.1	13
## 488	-17.61	181.20	537	4.1	11
## 495	-17.14	185.31	223	4.1	15
## 515	-17.81	181.82	598	4.1	14
## 522	-19.22	182.54	570	4.1	22
## 595	-21.79	185.00	74	4.1	15
## 671	-17.80	181.32	539	4.1	12
## 687	-18.89	181.24	655	4.1	14
## 690	-17.60	181.50	548	4.1	10
## 720	-17.20	182.90	383	4.1	11
## 738	-25.14	178.42	554	4.1	15
## 760	-16.43	186.73	75	4.1	20
## 763	-17.78	185.33	223	4.1	10
## 767	-19.10	184.52	230	4.1	16
## 776	-21.77	181.00	618	4.1	10
## 791	-18.07	181.65	593	4.1	16
## 793	-20.21	181.90	576	4.1	16
## 806	-19.13	184.97	210	4.1	22
## 820	-22.10	180.40	603	4.1	11
## 823	-22.14	179.62	587	4.1	23
## 832	-15.70	185.10	70	4.1	15
## 835	-19.40	182.29	326	4.1	15
## 836	-15.85	185.90	121	4.1	17
## 846	-17.56	181.23	580	4.1	16
## 851	-15.18	185.93	77	4.1	16
## 858	-15.65	185.17	315	4.1	15
## 863	-17.93	181.89	567	4.1	27
## 895	-17.74	181.25	559	4.1	16
## 924	-18.40	181.77	600	4.1	11
## 954	-23.47	179.95	543	4.1	21
## 964	-19.69	184.23	223	4.1	23
## 966	-17.99	181.59	595	4.1	26
## 2	-20.62	181.03	650	4.2	15
## 22	-10.98	166.32	211	4.2	12

## 51	-18.75	182.35	554	4.2	13
## 55	-20.10	182.16	489	4.2	16
## 79	-21.81	181.71	323	4.2	15
## 89	-15.43	186.30	123	4.2	16
## 94	-19.72	169.71	271	4.2	14
## 95	-15.44	185.26	224	4.2	21
## 106	-19.44	183.50	293	4.2	15
## 112	-16.85	182.31	388	4.2	14
## 116	-26.13	178.31	609	4.2	25
## 120	-18.96	169.48	248	4.2	13
## 127	-19.30	183.84	517	4.2	21
## 132	-17.05	181.22	527	4.2	24
## 140	-18.84	184.16	210	4.2	17
## 145	-14.31	173.50	614	4.2	23
## 146	-20.10	184.40	186	4.2	10
## 154	-11.80	165.80	112	4.2	20
## 157	-11.75	166.07	69	4.2	14
## 184	-20.30	183.00	375	4.2	15
## 196	-20.36	181.19	637	4.2	23
## 210	-20.20	182.30	533	4.2	11
## 217	-26.67	182.40	186	4.2	17
## 220	-18.31	182.39	342	4.2	14
## 224	-20.37	182.10	397	4.2	22
## 227	-21.55	182.90	207	4.2	18
## 250	-19.15	169.50	150	4.2	12
## 256	-20.32	180.88	680	4.2	22
## 259	-23.81	179.36	521	4.2	23
## 265	-19.41	183.05	300	4.2	16
## 274	-20.16	181.99	504	4.2	11
## 282	-22.32	180.54	565	4.2	12
## 287	-19.30	180.60	671	4.2	16
## 327	-21.04	181.20	483	4.2	10
## 341	-27.22	182.28	65	4.2	14
## 361	-17.98	181.58	590	4.2	14
## 369	-15.83	182.51	423	4.2	21
## 387	-17.82	181.49	573	4.2	14
## 394	-17.46	181.90	417	4.2	14
## 396	-23.70	179.60	646	4.2	21
## 410	-33.20	181.60	153	4.2	21
## 430	-17.47	180.96	546	4.2	23
## 493	-23.45	180.23	520	4.2	19
## 494	-16.04	183.54	384	4.2	23
## 499	-24.03	180.22	508	4.2	23
## 506	-19.41	182.30	589	4.2	19
## 538	-15.96	166.69	150	4.2	20
## 542	-15.29	166.90	100	4.2	15
## 556	-23.12	184.42	104	4.2	17
## 557	-23.65	184.46	93	4.2	16
## 565	-25.04	180.97	393	4.2	21
## 566	-19.92	183.91	264	4.2	23
## 614	-19.60	181.87	597	4.2	18
## 628	-25.25	179.86	491	4.2	23

## 631	-21.46	181.02	584	4.2	18
## 639	-17.40	186.54	85	4.2	28
## 650	-20.48	181.38	556	4.2	13
## 660	-17.88	180.58	622	4.2	23
## 665	-18.44	181.04	624	4.2	21
## 686	-18.69	169.10	218	4.2	27
## 688	-17.61	183.32	356	4.2	15
## 693	-20.61	182.44	518	4.2	10
## 701	-13.90	167.18	221	4.2	21
## 718	-26.10	182.50	133	4.2	17
## 734	-24.89	179.67	498	4.2	14
## 751	-18.04	181.84	611	4.2	20
## 779	-10.80	165.80	175	4.2	12
## 831	-30.63	180.90	334	4.2	28
## 833	-19.20	184.37	220	4.2	18
## 845	-26.06	180.05	432	4.2	19
## 864	-20.87	181.70	560	4.2	13
## 867	-22.85	181.37	397	4.2	15
## 868	-17.08	185.96	180	4.2	29
## 871	-20.91	181.57	530	4.2	20
## 877	-18.85	182.20	501	4.2	23
## 881	-18.40	184.84	221	4.2	18
## 882	-21.20	181.40	560	4.2	12
## 884	-11.70	166.30	139	4.2	15
## 892	-22.24	180.28	601	4.2	21
## 905	-17.46	181.42	524	4.2	16
## 906	-17.44	181.33	545	4.2	37
## 907	-24.71	179.85	477	4.2	34
## 917	-19.57	184.47	202	4.2	28
## 932	-23.47	180.21	553	4.2	23
## 939	-20.77	181.16	568	4.2	12
## 947	-18.98	182.32	442	4.2	22
## 968	-21.40	180.74	613	4.2	20
## 976	-17.03	185.74	178	4.2	32
## 986	-12.37	166.93	291	4.2	16
## 995	-17.70	188.10	45	4.2	10
## 10	-17.47	179.59	622	4.3	19
## 16	-15.94	184.95	306	4.3	11
## 36	-25.82	179.33	600	4.3	13
## 44	-15.49	186.04	94	4.3	26
## 49	-24.12	180.08	493	4.3	21
## 54	-21.37	180.67	593	4.3	13
## 60	-24.20	179.20	530	4.3	12
## 73	-11.55	166.20	96	4.3	14
## 76	-23.54	180.04	564	4.3	15
## 84	-20.12	183.40	284	4.3	15
## 86	-19.66	184.31	170	4.3	15
## 90	-15.41	186.44	69	4.3	42
## 122	-19.90	178.90	81	4.3	11
## 130	-19.19	183.51	307	4.3	19
## 135	-21.30	180.82	624	4.3	14
## 153	-23.83	182.56	229	4.3	24

## 158	-24.81	180.00	452	4.3	19
## 171	-17.82	181.83	640	4.3	24
## 182	-24.60	183.50	67	4.3	25
## 187	-22.30	181.90	309	4.3	11
## 199	-20.41	181.74	538	4.3	31
## 201	-19.67	182.18	360	4.3	23
## 206	-21.97	182.32	261	4.3	13
## 212	-16.17	184.10	338	4.3	13
## 215	-23.55	180.27	535	4.3	22
## 216	-20.94	181.58	573	4.3	21
## 232	-24.64	180.81	397	4.3	24
## 247	-17.95	181.65	619	4.3	26
## 278	-24.78	179.22	492	4.3	16
## 305	-14.99	171.39	637	4.3	21
## 344	-27.54	182.50	68	4.3	12
## 345	-27.20	182.39	69	4.3	14
## 346	-27.71	182.47	103	4.3	11
## 364	-32.14	179.90	406	4.3	19
## 391	-20.36	186.16	102	4.3	21
## 403	-30.40	181.40	40	4.3	17
## 406	-17.95	181.50	593	4.3	16
## 407	-20.51	182.30	492	4.3	23
## 414	-25.04	180.10	481	4.3	15
## 419	-34.10	181.80	246	4.3	23
## 421	-24.19	180.38	484	4.3	27
## 436	-27.63	182.93	80	4.3	14
## 441	-12.66	166.37	165	4.3	18
## 447	-15.72	185.64	138	4.3	21
## 451	-26.46	182.50	184	4.3	11
## 452	-24.09	179.68	538	4.3	21
## 454	-23.19	182.80	237	4.3	18
## 455	-20.81	184.70	162	4.3	20
## 473	-16.95	185.94	95	4.3	12
## 518	-20.75	184.52	144	4.3	25
## 521	-20.66	185.77	69	4.3	25
## 550	-21.16	181.41	543	4.3	17
## 551	-20.65	182.22	506	4.3	24
## 582	-20.57	181.33	605	4.3	18
## 591	-20.95	181.06	611	4.3	20
## 619	-18.07	181.54	546	4.3	28
## 635	-20.08	183.22	294	4.3	18
## 684	-18.19	181.74	616	4.3	17
## 691	-17.96	181.40	655	4.3	20
## 705	-19.45	184.48	246	4.3	15
## 710	-20.97	181.72	487	4.3	16
## 740	-25.28	181.17	367	4.3	25
## 761	-20.70	184.30	182	4.3	17
## 773	-19.60	184.53	199	4.3	21
## 774	-21.63	180.77	592	4.3	21
## 778	-21.05	180.90	616	4.3	10
## 784	-20.40	186.10	74	4.3	22
## 799	-22.90	183.80	71	4.3	19

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## 800 -18.11 181.63 568 4.3 36
## 809 -20.90 182.02 402 4.3 18
## 814 -23.73 183.00 118 4.3 11
## 824 -21.48 182.44 364 4.3 20
## 859 -30.01 181.15 210 4.3 17
## 860 -13.16 167.24 278 4.3 17
## 876 -18.94 182.43 566 4.3 20
## 894 -21.07 183.78 180 4.3 25
## 909 -19.17 169.53 268 4.3 21
## 923 -17.98 181.61 598 4.3 27
## 941 -20.83 181.01 622 4.3 15
## 956 -23.85 180.26 497 4.3 32
## 963 -12.57 166.72 137 4.3 20
## 979 -18.83 182.26 575 4.3 11
## 984 -27.99 183.50 71 4.3 22
## 991 -20.73 181.42 575 4.3 18
## 992 -15.45 181.42 409 4.3 27
## 8 -28.11 181.93 194 4.4 15
## 11 -21.44 180.69 583 4.4 13
## 13 -18.54 182.11 554 4.4 19
## 14 -21.00 181.66 600 4.4 10
## 19 -23.50 179.78 570 4.4 13
## 20 -22.63 180.31 598 4.4 18
## 23 -23.30 180.16 512 4.4 18
## 30 -19.84 182.37 328 4.4 17
## 40 -18.82 169.33 230 4.4 11
## 43 -24.97 179.82 511 4.4 23
## 48 -11.77 166.32 70 4.4 18
## 56 -19.85 182.13 562 4.4 31
## 59 -17.80 181.35 535 4.4 23
## 75 -17.70 181.23 546 4.4 35
## 107 -34.89 180.60 42 4.4 25
## 115 -26.20 178.35 606 4.4 21
## 125 -31.24 180.60 328 4.4 18
## 144 -29.91 181.43 205 4.4 34
## 147 -17.80 185.17 97 4.4 22
## 183 -19.88 184.30 161 4.4 17
## 219 -20.21 183.83 242 4.4 29
## 233 -16.00 182.82 431 4.4 16
## 237 -28.23 182.68 74 4.4 20
## 255 -29.10 182.10 179 4.4 19
## 263 -19.06 169.01 158 4.4 10
## 264 -17.88 181.47 562 4.4 27
## 268 -18.73 168.80 82 4.4 14
## 271 -19.76 181.41 105 4.4 15
## 281 -30.72 180.10 413 4.4 22
## 285 -17.95 184.68 260 4.4 21
## 301 -13.09 169.28 654 4.4 22
## 316 -17.40 181.02 479 4.4 14
## 323 -19.83 182.04 575 4.4 23
## 324 -29.50 182.31 129 4.4 14
## 326 -26.10 182.30 49 4.4 11
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## 333	-27.33	182.60	42	4.4	11
## 365	-18.80	169.21	221	4.4	16
## 375	-20.31	184.06	249	4.4	21
## 377	-18.20	181.60	553	4.4	14
## 382	-13.47	167.14	226	4.4	26
## 393	-20.94	181.26	556	4.4	21
## 405	-15.70	184.50	118	4.4	30
## 409	-23.61	180.23	475	4.4	26
## 415	-21.50	185.20	139	4.4	15
## 417	-14.43	167.26	151	4.4	17
## 418	-32.70	181.70	211	4.4	40
## 429	-19.47	169.15	149	4.4	15
## 435	-21.80	183.20	325	4.4	19
## 437	-18.89	169.48	259	4.4	21
## 461	-15.66	186.80	45	4.4	11
## 464	-18.05	180.86	632	4.4	15
## 466	-20.90	181.90	556	4.4	17
## 467	-15.61	167.50	135	4.4	21
## 469	-17.68	181.11	568	4.4	22
## 472	-18.00	185.48	143	4.4	29
## 480	-19.60	185.20	125	4.4	13
## 487	-34.40	180.50	201	4.4	41
## 497	-15.90	185.30	57	4.4	19
## 504	-13.07	166.87	132	4.4	24
## 508	-11.76	165.96	45	4.4	51
## 519	-19.50	186.90	58	4.4	20
## 529	-15.26	183.13	393	4.4	28
## 575	-18.18	182.04	609	4.4	26
## 588	-24.96	179.87	480	4.4	25
## 592	-21.58	181.90	409	4.4	19
## 607	-22.00	185.50	52	4.4	18
## 611	-30.09	182.40	51	4.4	18
## 620	-12.85	165.67	75	4.4	30
## 633	-28.56	183.59	53	4.4	20
## 648	-15.48	186.73	82	4.4	17
## 654	-23.10	180.12	533	4.4	27
## 668	-15.85	184.83	299	4.4	30
## 670	-18.60	184.28	255	4.4	31
## 682	-20.16	184.27	210	4.4	27
## 685	-15.35	186.40	98	4.4	17
## 695	-25.23	179.86	476	4.4	29
## 696	-23.90	179.90	579	4.4	16
## 709	-21.56	183.23	271	4.4	36
## 716	-13.36	172.76	618	4.4	18
## 726	-18.76	169.71	287	4.4	23
## 730	-21.26	181.69	487	4.4	20
## 747	-30.51	181.30	203	4.4	20
## 756	-12.16	167.03	264	4.4	14
## 768	-19.85	184.51	184	4.4	26
## 777	-21.80	183.60	213	4.4	17
## 795	-20.74	180.70	589	4.4	27
## 797	-18.91	169.46	248	4.4	33

## 804	-12.93	169.52	663	4.4	30
## 825	-18.54	168.93	100	4.4	17
## 828	-15.50	185.30	93	4.4	25
## 829	-15.67	185.23	66	4.4	34
## 842	-15.80	185.25	82	4.4	39
## 874	-22.09	180.58	580	4.4	22
## 880	-18.10	181.63	592	4.4	28
## 896	-23.87	180.15	524	4.4	22
## 913	-15.28	185.98	162	4.4	36
## 914	-20.27	181.51	609	4.4	32
## 971	-25.79	182.38	172	4.4	14
## 977	-20.77	183.71	251	4.4	47
## 978	-28.10	183.50	42	4.4	17
## 996	-25.93	179.54	470	4.4	22
## 18	-17.83	181.50	590	4.5	21
## 21	-20.84	181.16	576	4.5	17
## 29	-20.97	181.47	582	4.5	25
## 35	-16.30	186.00	48	4.5	10
## 37	-18.73	169.23	206	4.5	17
## 47	-26.40	181.70	329	4.5	24
## 57	-22.70	181.00	445	4.5	17
## 69	-20.42	181.86	530	4.5	27
## 72	-19.86	184.35	201	4.5	30
## 78	-12.11	167.06	265	4.5	23
## 82	-23.84	180.99	367	4.5	27
## 88	-23.64	179.96	538	4.5	26
## 97	-27.24	181.11	365	4.5	21
## 111	-15.75	185.23	280	4.5	28
## 124	-19.22	182.43	571	4.5	23
## 131	-17.43	185.43	189	4.5	22
## 133	-19.52	168.98	63	4.5	21
## 170	-18.89	169.42	239	4.5	27
## 178	-17.42	185.16	206	4.5	22
## 181	-18.04	181.75	640	4.5	47
## 198	-24.00	182.75	175	4.5	14
## 204	-26.72	183.35	190	4.5	36
## 205	-12.95	169.09	629	4.5	19
## 208	-20.32	181.69	508	4.5	14
## 225	-23.77	180.16	505	4.5	26
## 228	-16.24	185.75	154	4.5	22
## 235	-23.84	180.13	525	4.5	15
## 241	-20.08	182.74	298	4.5	33
## 252	-14.85	167.24	97	4.5	26
## 270	-21.29	180.85	607	4.5	23
## 279	-22.00	180.52	561	4.5	19
## 289	-18.07	181.57	572	4.5	26
## 314	-21.34	181.41	464	4.5	21
## 319	-26.16	179.50	492	4.5	25
## 332	-23.91	180.00	534	4.5	11
## 336	-27.18	182.18	56	4.5	14
## 337	-25.80	182.10	68	4.5	26
## 339	-27.27	182.38	45	4.5	16

## 343	-27.27	182.50	51	4.5	13
## 348	-27.38	182.39	69	4.5	12
## 368	-18.30	183.20	103	4.5	14
## 388	-27.23	180.98	401	4.5	39
## 411	-17.68	186.80	112	4.5	35
## 422	-26.60	182.77	119	4.5	29
## 438	-20.30	182.30	476	4.5	10
## 439	-20.56	182.04	499	4.5	29
## 450	-25.31	180.15	467	4.5	25
## 457	-18.06	181.59	604	4.5	23
## 458	-19.00	185.60	107	4.5	15
## 475	-20.83	185.90	104	4.5	19
## 479	-23.56	180.23	474	4.5	13
## 481	-21.39	180.68	617	4.5	18
## 491	-30.24	181.63	80	4.5	17
## 503	-21.06	183.81	203	4.5	34
## 509	-12.08	165.76	63	4.5	51
## 524	-15.43	167.38	137	4.5	16
## 526	-21.31	180.84	586	4.5	17
## 543	-15.86	166.85	85	4.5	22
## 544	-16.20	166.80	98	4.5	21
## 560	-13.56	166.49	83	4.5	25
## 567	-27.75	182.26	174	4.5	18
## 569	-19.60	183.84	309	4.5	23
## 573	-17.02	182.41	420	4.5	29
## 576	-16.49	187.80	40	4.5	18
## 578	-20.49	181.69	559	4.5	24
## 626	-23.97	179.91	518	4.5	23
## 634	-21.30	180.92	617	4.5	26
## 642	-16.23	167.91	182	4.5	28
## 659	-17.94	180.60	627	4.5	29
## 674	-19.34	182.62	573	4.5	32
## 694	-20.74	181.53	598	4.5	36
## 704	-25.00	180.00	488	4.5	10
## 706	-16.11	187.48	61	4.5	19
## 725	-16.31	168.08	204	4.5	16
## 728	-19.28	182.78	348	4.5	30
## 735	-14.57	167.24	162	4.5	18
## 737	-22.06	183.95	134	4.5	17
## 749	-22.14	180.64	591	4.5	18
## 755	-24.41	180.03	500	4.5	34
## 762	-21.18	180.92	619	4.5	18
## 766	-12.27	167.41	50	4.5	29
## 781	-22.26	171.44	83	4.5	25
## 789	-21.56	185.50	47	4.5	29
## 796	-31.80	180.60	178	4.5	19
## 798	-20.45	182.10	500	4.5	37
## 802	-23.42	180.21	510	4.5	37
## 803	-23.20	184.80	97	4.5	13
## 805	-21.14	181.06	625	4.5	35
## 813	-15.83	167.10	43	4.5	19
## 817	-15.39	185.10	237	4.5	39

## 848	-25.46	179.98	479	4.5	27
## 855	-17.90	181.41	586	4.5	33
## 872	-11.38	167.05	133	4.5	32
## 878	-21.91	181.28	548	4.5	30
## 886	-24.39	178.98	562	4.5	30
## 898	-22.20	180.58	594	4.5	45
## 901	-32.14	180.00	331	4.5	27
## 904	-20.18	181.62	558	4.5	31
## 926	-20.99	181.02	626	4.5	36
## 931	-17.63	185.13	219	4.5	28
## 951	-17.93	181.62	561	4.5	32
## 953	-18.68	184.50	174	4.5	34
## 959	-20.97	181.20	605	4.5	31
## 961	-23.90	184.60	41	4.5	22
## 985	-15.54	187.15	60	4.5	17
## 998	-20.13	184.20	244	4.5	34
## 999	-17.40	187.80	40	4.5	14
## 12	-12.26	167.00	249	4.6	16
## 27	-14.72	167.51	155	4.6	18
## 31	-22.58	179.24	553	4.6	21
## 38	-17.64	181.28	574	4.6	17
## 42	-15.31	186.10	96	4.6	32
## 45	-19.23	169.41	246	4.6	27
## 53	-22.75	173.20	46	4.6	26
## 64	-11.49	166.22	84	4.6	32
## 83	-19.57	182.38	579	4.6	38
## 102	-26.20	178.41	583	4.6	25
## 105	-21.33	180.69	636	4.6	29
## 108	-20.24	169.49	100	4.6	22
## 134	-23.71	180.30	510	4.6	30
## 138	-23.95	182.80	199	4.6	14
## 141	-12.66	169.46	658	4.6	43
## 160	-11.34	166.24	103	4.6	30
## 163	-13.86	167.16	202	4.6	30
## 164	-35.56	180.20	42	4.6	32
## 172	-25.68	180.34	434	4.6	41
## 180	-15.02	184.24	339	4.6	27
## 189	-24.27	179.88	523	4.6	24
## 190	-15.85	185.13	290	4.6	29
## 193	-17.87	182.00	569	4.6	12
## 195	-32.20	179.61	422	4.6	41
## 197	-23.85	182.53	204	4.6	27
## 218	-18.13	181.52	618	4.6	41
## 222	-22.36	171.65	130	4.6	39
## 246	-18.11	181.67	597	4.6	28
## 257	-16.09	184.89	304	4.6	34
## 267	-14.95	167.24	130	4.6	16
## 269	-20.21	182.37	482	4.6	37
## 276	-17.44	181.40	529	4.6	25
## 283	-16.45	177.77	138	4.6	17
## 293	-20.92	181.50	546	4.6	31
## 294	-25.31	179.69	507	4.6	35

## 300	-18.64	169.32	260	4.6	23
## 304	-21.09	181.38	555	4.6	15
## 309	-21.38	181.39	501	4.6	36
## 328	-10.78	165.77	93	4.6	20
## 329	-20.76	185.77	118	4.6	15
## 347	-27.60	182.40	61	4.6	11
## 350	-27.21	182.43	55	4.6	10
## 351	-28.96	182.61	54	4.6	15
## 359	-27.18	182.53	60	4.6	21
## 366	-26.78	183.61	40	4.6	22
## 379	-15.29	186.42	153	4.6	31
## 402	-11.63	166.14	109	4.6	36
## 426	-33.00	182.40	176	4.6	28
## 428	-20.61	182.60	488	4.6	12
## 444	-19.83	182.54	524	4.6	14
## 456	-15.03	167.32	136	4.6	20
## 460	-18.18	180.63	639	4.6	39
## 476	-32.90	181.60	169	4.6	27
## 478	-29.09	183.20	54	4.6	23
## 490	-13.84	170.62	638	4.6	20
## 502	-20.10	186.30	63	4.6	19
## 505	-23.46	180.09	543	4.6	28
## 514	-23.46	180.17	541	4.6	32
## 517	-11.67	166.02	102	4.6	21
## 527	-15.44	167.18	140	4.6	44
## 532	-15.79	166.83	45	4.6	39
## 534	-16.28	166.94	50	4.6	24
## 540	-17.56	181.59	543	4.6	34
## 546	-16.45	167.54	125	4.6	18
## 548	-19.61	181.91	590	4.6	34
## 559	-22.06	180.47	587	4.6	28
## 577	-17.74	181.31	575	4.6	42
## 585	-20.89	181.25	599	4.6	20
## 587	-20.09	168.75	50	4.6	23
## 589	-20.95	181.42	559	4.6	27
## 596	-20.48	169.76	134	4.6	33
## 602	-28.10	182.25	68	4.6	18
## 603	-21.24	180.81	605	4.6	34
## 610	-33.03	180.20	186	4.6	27
## 640	-23.93	180.18	525	4.6	31
## 641	-21.23	181.09	613	4.6	18
## 645	-20.72	181.41	595	4.6	36
## 647	-38.46	176.03	148	4.6	44
## 656	-22.87	171.72	47	4.6	27
## 658	-27.60	182.10	154	4.6	22
## 673	-18.12	181.71	594	4.6	24
## 677	-15.97	186.08	143	4.6	41
## 683	-25.48	180.94	390	4.6	33
## 707	-23.73	179.98	524	4.6	11
## 715	-22.16	180.49	586	4.6	13
## 739	-20.30	181.40	608	4.6	13
## 741	-20.63	181.61	599	4.6	30

## 743	-22.10	185.30	50	4.6	22
## 748	-22.55	183.34	66	4.6	18
## 810	-25.04	179.84	474	4.6	32
## 811	-21.85	180.89	577	4.6	43
## 815	-18.10	181.72	544	4.6	52
## 819	-21.75	180.67	595	4.6	30
## 830	-21.78	183.11	225	4.6	21
## 887	-19.64	169.50	204	4.6	35
## 911	-23.39	179.97	541	4.6	50
## 912	-22.33	171.51	112	4.6	14
## 933	-23.92	180.21	524	4.6	50
## 934	-20.88	185.18	51	4.6	28
## 943	-19.94	182.39	544	4.6	30
## 946	-30.39	182.40	63	4.6	22
## 9	-28.74	181.74	211	4.7	35
## 24	-30.20	182.00	125	4.7	22
## 32	-16.32	166.74	50	4.7	30
## 41	-37.37	176.78	263	4.7	34
## 61	-20.69	181.55	582	4.7	35
## 66	-17.10	184.93	286	4.7	25
## 87	-21.50	170.50	117	4.7	32
## 92	-13.36	167.06	236	4.7	22
## 100	-24.57	179.92	484	4.7	33
## 103	-21.88	180.39	608	4.7	30
## 104	-33.00	181.60	72	4.7	22
## 118	-13.47	172.29	64	4.7	14
## 123	-22.05	180.40	606	4.7	27
## 136	-16.24	168.02	53	4.7	12
## 155	-15.54	167.68	140	4.7	16
## 156	-20.65	181.32	597	4.7	39
## 169	-23.43	180.00	553	4.7	41
## 192	-18.56	169.31	223	4.7	35
## 203	-16.23	183.59	367	4.7	35
## 209	-30.28	180.62	350	4.7	32
## 211	-30.66	180.13	411	4.7	42
## 221	-16.52	185.70	90	4.7	30
## 231	-19.40	180.94	664	4.7	34
## 239	-13.44	166.53	44	4.7	27
## 248	-15.50	186.90	46	4.7	18
## 251	-10.97	166.26	180	4.7	26
## 258	-19.18	169.33	254	4.7	35
## 262	-20.90	181.51	548	4.7	32
## 286	-24.40	179.85	522	4.7	29
## 288	-21.13	185.32	123	4.7	36
## 303	-16.44	185.74	126	4.7	30
## 306	-23.30	179.70	500	4.7	29
## 340	-27.10	182.18	43	4.7	17
## 355	-27.27	182.36	65	4.7	21
## 360	-11.64	166.47	130	4.7	19
## 401	-30.80	182.16	41	4.7	24
## 408	-15.36	167.51	123	4.7	28
## 425	-32.60	180.90	57	4.7	44

## 427	-20.58	181.24	602	4.7	44
## 432	-23.33	180.26	530	4.7	22
## 440	-16.10	185.32	257	4.7	30
## 442	-21.05	184.68	136	4.7	29
## 446	-22.28	183.52	90	4.7	19
## 453	-16.96	167.70	45	4.7	23
## 470	-31.94	180.57	168	4.7	39
## 471	-19.14	184.36	269	4.7	31
## 507	-11.81	165.98	51	4.7	28
## 511	-26.54	183.63	66	4.7	34
## 513	-16.99	187.00	70	4.7	30
## 516	-15.17	187.20	50	4.7	28
## 520	-26.18	179.79	460	4.7	44
## 523	-24.68	183.33	70	4.7	30
## 530	-33.57	180.80	51	4.7	35
## 536	-16.10	167.25	68	4.7	36
## 537	-17.70	181.31	549	4.7	33
## 553	-15.08	166.62	42	4.7	23
## 554	-23.28	184.61	76	4.7	36
## 562	-23.92	184.47	40	4.7	17
## 584	-20.04	181.87	577	4.7	19
## 593	-13.62	167.15	209	4.7	30
## 599	-23.89	182.39	243	4.7	32
## 600	-23.07	184.03	89	4.7	32
## 606	-32.82	179.80	176	4.7	26
## 613	-17.99	168.98	234	4.7	28
## 621	-33.29	181.30	60	4.7	33
## 622	-34.63	179.10	278	4.7	24
## 627	-34.12	181.75	75	4.7	41
## 644	-20.81	185.01	79	4.7	42
## 655	-14.28	170.34	642	4.7	29
## 679	-23.11	179.15	564	4.7	17
## 711	-15.45	186.73	83	4.7	37
## 719	-18.35	185.27	201	4.7	57
## 721	-22.42	171.40	86	4.7	33
## 729	-23.50	180.00	550	4.7	23
## 731	-17.97	181.48	578	4.7	43
## 732	-26.02	181.20	361	4.7	32
## 736	-15.40	186.87	78	4.7	44
## 744	-38.59	175.70	162	4.7	36
## 769	-11.37	166.55	188	4.7	24
## 782	-22.33	171.46	119	4.7	32
## 786	-27.87	183.40	87	4.7	34
## 808	-20.07	181.75	582	4.7	27
## 822	-19.36	186.36	100	4.7	40
## 837	-17.38	168.63	209	4.7	29
## 852	-13.79	166.56	68	4.7	41
## 857	-14.82	171.17	658	4.7	49
## 862	-21.40	180.78	615	4.7	51
## 918	-23.08	183.45	90	4.7	30
## 929	-25.81	182.54	201	4.7	40
## 940	-17.95	181.73	583	4.7	57

## 949	-23.50	184.90	61	4.7	16
## 950	-23.73	184.49	60	4.7	35
## 957	-27.08	183.44	63	4.7	27
## 960	-21.71	183.58	234	4.7	55
## 973	-24.10	184.50	68	4.7	23
## 982	-22.95	170.56	42	4.7	21
## 990	-16.00	184.53	108	4.7	33
## 997	-12.28	167.06	248	4.7	35
## 1	-20.42	181.62	562	4.8	41
## 7	-11.70	166.10	82	4.8	43
## 33	-15.55	185.05	292	4.8	42
## 114	-26.11	178.30	617	4.8	39
## 119	-14.60	167.40	178	4.8	52
## 121	-14.65	166.97	82	4.8	28
## 129	-27.72	181.70	94	4.8	59
## 162	-24.34	179.52	504	4.8	34
## 165	-35.48	179.90	59	4.8	35
## 240	-24.96	180.22	470	4.8	41
## 244	-18.20	183.68	107	4.8	52
## 292	-13.34	166.20	67	4.8	18
## 302	-19.68	184.14	242	4.8	40
## 310	-32.62	181.50	55	4.8	26
## 321	-14.82	167.32	123	4.8	28
## 342	-27.38	181.70	80	4.8	13
## 392	-27.17	183.68	44	4.8	27
## 412	-22.24	184.56	99	4.8	57
## 413	-20.07	169.14	66	4.8	37
## 420	-19.70	186.20	47	4.8	19
## 434	-26.16	178.47	537	4.8	33
## 443	-17.97	168.52	146	4.8	33
## 468	-16.03	185.43	297	4.8	25
## 492	-18.49	169.04	211	4.8	30
## 498	-30.04	181.20	49	4.8	20
## 500	-18.89	184.46	242	4.8	36
## 535	-23.28	184.60	44	4.8	34
## 545	-15.71	166.91	58	4.8	20
## 552	-20.33	168.71	40	4.8	38
## 555	-23.44	184.60	63	4.8	27
## 572	-18.85	187.55	44	4.8	35
## 581	-15.90	167.16	41	4.8	42
## 586	-16.62	186.74	82	4.8	51
## 594	-12.72	166.28	70	4.8	47
## 609	-24.50	180.92	377	4.8	43
## 612	-22.75	170.99	67	4.8	35
## 616	-17.78	181.53	511	4.8	56
## 630	-18.48	182.37	376	4.8	57
## 632	-28.56	183.47	48	4.8	56
## 646	-23.29	184.00	164	4.8	50
## 652	-18.17	181.98	651	4.8	43
## 661	-30.01	180.80	286	4.8	43
## 667	-18.26	180.98	631	4.8	36
## 669	-23.82	180.09	498	4.8	40

## 676	-24.97	182.85	137	4.8	40
## 678	-23.47	180.24	511	4.8	37
## 699	-14.30	167.32	208	4.8	25
## 717	-21.22	181.51	524	4.8	49
## 818	-16.21	186.52	111	4.8	30
## 827	-13.40	166.90	228	4.8	15
## 838	-24.33	179.97	510	4.8	44
## 841	-17.99	181.62	574	4.8	38
## 847	-25.63	180.26	464	4.8	60
## 854	-18.78	186.72	68	4.8	48
## 865	-12.01	166.66	99	4.8	36
## 866	-19.10	169.63	266	4.8	31
## 879	-22.03	179.77	587	4.8	31
## 891	-12.57	167.11	231	4.8	28
## 930	-14.10	166.01	69	4.8	29
## 942	-27.84	182.10	193	4.8	27
## 945	-23.70	184.13	51	4.8	27
## 962	-15.78	167.44	40	4.8	42
## 967	-23.50	180.13	512	4.8	40
## 969	-15.86	166.98	60	4.8	25
## 988	-22.70	170.30	69	4.8	27
## 46	-30.10	182.30	56	4.9	34
## 65	-20.68	181.41	593	4.9	40
## 139	-25.20	182.60	149	4.9	31
## 148	-21.27	173.49	48	4.9	42
## 159	-20.90	169.84	93	4.9	31
## 186	-17.67	187.09	45	4.9	62
## 188	-19.85	181.85	576	4.9	54
## 223	-22.43	184.48	65	4.9	48
## 226	-13.65	166.66	71	4.9	52
## 234	-19.62	185.35	57	4.9	31
## 254	-22.50	170.40	106	4.9	38
## 260	-23.79	179.89	526	4.9	43
## 266	-26.17	184.20	65	4.9	37
## 272	-22.09	180.38	590	4.9	35
## 308	-22.00	180.53	583	4.9	20
## 311	-13.05	169.58	644	4.9	68
## 315	-21.48	183.78	200	4.9	54
## 320	-12.59	167.10	325	4.9	26
## 325	-12.49	166.36	74	4.9	55
## 352	-12.01	166.29	59	4.9	27
## 390	-27.00	183.88	56	4.9	36
## 395	-21.04	181.20	591	4.9	45
## 484	-32.42	181.21	47	4.9	39
## 489	-21.07	181.13	594	4.9	43
## 501	-16.51	187.10	62	4.9	46
## 510	-25.59	180.02	485	4.9	48
## 561	-17.99	181.57	579	4.9	49
## 563	-30.69	182.10	62	4.9	25
## 597	-12.84	166.78	150	4.9	35
## 604	-21.24	180.86	615	4.9	23
## 608	-21.57	185.62	66	4.9	38

## 617	-22.04	184.91	47	4.9	47
## 625	-22.37	171.50	116	4.9	38
## 662	-19.19	182.30	390	4.9	48
## 672	-10.78	166.10	195	4.9	45
## 680	-20.54	181.66	559	4.9	50
## 713	-21.47	185.86	55	4.9	46
## 723	-26.53	178.30	605	4.9	43
## 754	-20.64	169.66	89	4.9	42
## 792	-26.00	178.43	644	4.9	27
## 807	-21.08	181.30	557	4.9	78
## 821	-24.97	179.54	505	4.9	50
## 873	-11.02	167.01	62	4.9	36
## 897	-21.29	185.80	69	4.9	74
## 899	-15.24	185.11	262	4.9	56
## 903	-33.09	180.94	47	4.9	47
## 915	-10.96	165.97	76	4.9	64
## 927	-14.86	167.32	137	4.9	22
## 958	-20.88	184.95	82	4.9	50
## 974	-18.56	169.05	217	4.9	35
## 975	-23.30	184.68	102	4.9	27
## 980	-23.00	170.70	43	4.9	20
## 983	-28.22	183.60	75	4.9	49
## 993	-20.05	183.86	243	4.9	65
## 63	-13.82	172.38	613	5.0	61
## 68	-21.96	179.62	627	5.0	45
## 110	-36.95	177.81	146	5.0	35
## 128	-26.53	178.57	600	5.0	69
## 143	-13.23	167.10	220	5.0	46
## 166	-34.20	179.43	40	5.0	37
## 177	-22.64	180.64	544	5.0	50
## 229	-23.73	182.53	232	5.0	55
## 230	-22.34	171.52	106	5.0	43
## 238	-21.68	180.63	617	5.0	63
## 245	-16.65	185.51	218	5.0	52
## 277	-23.33	180.18	528	5.0	59
## 290	-20.60	182.28	529	5.0	50
## 291	-18.48	181.49	641	5.0	49
## 295	-15.24	186.21	158	5.0	57
## 296	-16.40	185.86	148	5.0	47
## 334	-12.25	166.60	219	5.0	28
## 349	-21.54	185.48	51	5.0	29
## 356	-17.79	181.32	587	5.0	49
## 383	-25.50	182.82	124	5.0	25
## 384	-14.32	167.33	204	5.0	49
## 398	-15.87	188.13	52	5.0	30
## 462	-18.00	180.62	636	5.0	100
## 474	-10.79	166.06	142	5.0	40
## 549	-15.61	187.15	49	5.0	30
## 574	-20.41	186.51	63	5.0	28
## 638	-12.05	167.39	332	5.0	36
## 643	-28.15	183.40	57	5.0	32
## 664	-23.46	180.11	539	5.0	41

## 689	-20.93	181.54	564	5.0	64
## 697	-18.07	181.58	603	5.0	65
## 700	-18.04	181.57	587	5.0	51
## 724	-26.50	178.29	609	5.0	50
## 745	-19.30	183.00	302	5.0	65
## 783	-24.04	184.85	70	5.0	48
## 788	-23.61	180.27	537	5.0	63
## 790	-21.19	181.58	490	5.0	77
## 801	-23.80	184.70	42	5.0	36
## 840	-18.97	169.44	242	5.0	41
## 843	-25.42	182.65	102	5.0	36
## 849	-22.23	180.48	581	5.0	54
## 883	-12.00	166.20	94	5.0	31
## 888	-21.35	170.04	56	5.0	22
## 889	-22.82	184.52	49	5.0	52
## 902	-19.30	185.86	48	5.0	40
## 922	-20.56	184.41	138	5.0	82
## 981	-20.82	181.67	577	5.0	67
## 50	-18.97	185.25	129	5.1	73
## 91	-15.48	167.53	128	5.1	61
## 99	-13.66	166.54	50	5.1	45
## 126	-17.93	167.89	49	5.1	43
## 137	-16.14	187.32	42	5.1	68
## 253	-17.80	181.38	587	5.1	47
## 261	-19.02	184.23	270	5.1	72
## 312	-12.93	169.63	641	5.1	57
## 335	-23.49	179.07	544	5.1	58
## 357	-22.19	171.40	150	5.1	49
## 367	-20.43	182.37	502	5.1	48
## 371	-23.73	179.99	527	5.1	49
## 373	-17.59	181.09	536	5.1	61
## 374	-19.77	181.40	630	5.1	54
## 378	-15.36	186.66	112	5.1	57
## 381	-16.24	167.95	188	5.1	68
## 385	-20.04	182.01	605	5.1	49
## 386	-28.83	181.66	221	5.1	63
## 416	-14.28	167.26	211	5.1	51
## 424	-22.10	179.71	579	5.1	58
## 445	-22.55	183.81	82	5.1	68
## 448	-20.85	181.59	499	5.1	91
## 465	-29.90	181.16	215	5.1	51
## 528	-13.26	167.01	213	5.1	70
## 580	-27.28	183.40	70	5.1	54
## 583	-11.25	166.36	130	5.1	55
## 590	-23.31	179.27	566	5.1	49
## 615	-15.65	186.26	64	5.1	54
## 618	-20.06	168.69	49	5.1	49
## 624	-23.78	180.31	518	5.1	71
## 629	-22.87	172.65	56	5.1	50
## 657	-17.59	180.98	548	5.1	79
## 708	-17.74	186.78	104	5.1	71
## 714	-21.44	170.45	166	5.1	22

## 759	-12.34	167.43	50	5.1	47
## 764	-21.57	183.86	156	5.1	70
## 771	-20.24	185.10	86	5.1	61
## 785	-15.00	184.62	40	5.1	54
## 839	-20.89	185.26	54	5.1	44
## 850	-21.55	181.39	513	5.1	81
## 910	-28.05	182.39	117	5.1	43
## 916	-21.52	169.75	61	5.1	40
## 925	-27.64	182.22	162	5.1	67
## 28	-16.46	180.79	498	5.2	79
## 74	-23.74	179.99	506	5.2	75
## 81	-34.02	180.21	75	5.2	65
## 93	-20.64	182.02	497	5.2	64
## 98	-18.16	183.41	306	5.2	54
## 200	-17.72	180.30	595	5.2	74
## 207	-21.96	180.54	603	5.2	66
## 280	-19.13	182.51	579	5.2	56
## 322	-21.79	183.48	210	5.2	69
## 463	-18.08	180.70	628	5.2	72
## 486	-23.58	183.40	94	5.2	79
## 568	-17.71	181.18	574	5.2	67
## 571	-14.46	167.26	195	5.2	87
## 579	-18.51	182.64	405	5.2	74
## 601	-27.98	181.96	53	5.2	89
## 666	-18.21	180.87	631	5.2	69
## 692	-18.80	182.41	385	5.2	67
## 702	-17.64	177.01	545	5.2	91
## 703	-17.98	181.51	586	5.2	68
## 742	-19.02	186.83	45	5.2	65
## 746	-31.03	181.59	57	5.2	49
## 812	-19.34	186.59	56	5.2	49
## 844	-21.60	169.90	43	5.2	56
## 853	-15.18	167.23	71	5.2	59
## 885	-26.72	182.69	162	5.2	64
## 908	-21.53	170.52	129	5.2	30
## 938	-22.41	183.99	128	5.2	72
## 972	-23.75	184.50	54	5.2	74
## 987	-22.33	171.66	125	5.2	51
## 80	-28.98	181.11	304	5.3	60
## 117	-13.66	172.23	46	5.3	67
## 149	-23.58	180.17	462	5.3	63
## 168	-19.89	183.84	244	5.3	73
## 191	-20.02	184.09	234	5.3	71
## 243	-14.70	166.00	48	5.3	16
## 249	-23.36	180.01	553	5.3	61
## 318	-18.77	169.24	218	5.3	53
## 330	-11.41	166.24	83	5.3	55
## 331	-19.10	183.87	61	5.3	42
## 397	-17.72	181.42	565	5.3	89
## 400	-13.45	170.30	641	5.3	93
## 564	-21.92	182.80	273	5.3	78
## 623	-24.18	179.02	550	5.3	86

## 675	-15.34	167.10	128	5.3	18
## 681	-18.92	169.37	248	5.3	60
## 752	-21.29	185.77	57	5.3	69
## 758	-21.13	185.60	85	5.3	86
## 765	-13.70	166.75	46	5.3	71
## 787	-14.12	166.64	63	5.3	69
## 921	-15.99	167.95	190	5.3	81
## 3	-26.00	184.10	42	5.4	43
## 25	-19.66	180.28	431	5.4	57
## 214	-20.47	185.68	93	5.4	85
## 313	-18.60	181.91	442	5.4	82
## 338	-27.19	182.18	69	5.4	68
## 363	-21.98	179.60	583	5.4	67
## 372	-19.89	184.08	219	5.4	105
## 404	-26.18	178.59	548	5.4	65
## 459	-23.53	179.99	538	5.4	87
## 477	-37.93	177.47	65	5.4	65
## 539	-15.95	167.34	47	5.4	87
## 547	-11.54	166.18	89	5.4	80
## 651	-18.12	181.88	649	5.4	88
## 757	-17.10	185.90	127	5.4	75
## 890	-38.28	177.10	100	5.4	71
## 928	-29.33	182.72	57	5.4	61
## 936	-19.33	186.16	44	5.4	110
## 944	-23.60	183.99	118	5.4	88
## 965	-22.04	183.95	109	5.4	61
## 970	-23.95	184.64	43	5.4	45
## 70	-15.46	187.81	40	5.5	91
## 354	-30.17	182.02	56	5.5	68
## 358	-17.10	182.68	403	5.5	82
## 380	-15.36	186.71	130	5.5	95
## 449	-21.11	181.50	538	5.5	104
## 496	-22.54	172.91	54	5.5	71
## 512	-20.90	184.28	58	5.5	92
## 525	-32.45	181.15	41	5.5	81
## 531	-15.77	167.01	64	5.5	73
## 541	-15.90	167.42	40	5.5	86
## 663	-18.14	180.87	624	5.5	105
## 893	-13.80	166.53	42	5.5	70
## 948	-27.89	182.92	87	5.5	67
## 952	-35.94	178.52	138	5.5	78
## 167	-26.00	182.12	205	5.6	98
## 297	-24.57	178.40	562	5.6	80
## 570	-34.68	179.82	75	5.6	79
## 636	-18.82	182.21	417	5.6	129
## 649	-37.03	177.52	153	5.6	87
## 653	-11.40	166.07	93	5.6	94
## 712	-15.93	167.91	183	5.6	109
## 920	-17.85	181.44	589	5.6	115
## 935	-20.25	184.75	107	5.6	121
## 109	-22.55	185.90	42	5.7	76
## 151	-23.34	184.50	56	5.7	106

```
## 176 -32.22 180.20 216 5.7      90
## 275 -22.13 180.38 577 5.7     104
## 376 -15.33 186.75 48 5.7     123
## 399 -17.84 181.30 535 5.7     112
## 605 -19.89 174.46 546 5.7      99
## 869 -21.14 174.21 40 5.7      78
## 558 -22.91 183.95 64 5.9     118
## 753 -21.08 180.85 627 5.9     119
## 17 -13.64 165.96 50 6.0      83
## 870 -12.23 167.02 242 6.0     132
## 1000 -21.59 170.56 165 6.0    119
## 15 -20.70 169.92 139 6.1     94
## 152 -15.56 167.62 127 6.4    122
```

#Order function returns the index number. It sorts the data in ascending order as per the index number.

H. Print the top rows of each of the sorted dataframes using the **head()** function and explain in a comment what you see - did the two sorting functions produce a similar result?

```
head(quakeSortedDF1,5)
```

```
##      lat   long depth mag stations
## 1 -20.42 181.96  649   4      11
## 2 -19.68 184.31  195   4      12
## 3 -17.94 181.49  537   4      15
## 4 -23.55 180.80  349   4      10
## 5 -19.26 184.42  223   4      15
```

```
head(quakeSortedDF2,5)
```

```
##      lat   long depth mag stations
## 5 -20.42 181.96  649   4      11
## 6 -19.68 184.31  195   4      12
## 26 -17.94 181.49  537   4      15
## 34 -23.55 180.80  349   4      10
## 52 -19.26 184.42  223   4      15
```

both the head functions above displayed similar output except there is a change in the index number of rows in both the output.

I. What are the latitude and longitude of the quake reported by the largest number of stations?

```
sta <- which.max(myQuakes$stations)
dep <- select(myQuakes, lat, long)
dep[sta, ]
```

```
##      lat   long
## 870 -12.23 167.02
```

J. What are the latitude and longitude of the quake with the smallest magnitude?

```
mag1 <- which.min(myQuakes$mag)
dep[mag1, ]
```

```
##      lat   long
## 5 -20.42 181.96
```

Step 3: Using conditional if statements

A. Test if **maxQuake** is greater than 6 (output yes or no)

Hint: Try modifying the following code in R:

```
if (maxQuake > 6) "Yes" else "No"
```

```
## [1] "Yes"
```

B. Following the same logic, test if **minQuake** is less than 3 (output yes or no):

```
if (maxQuake < 3) "Yes" else "No"
```

```
## [1] "No"
```