Reproducible Research: Peer Assessment 1

Contents

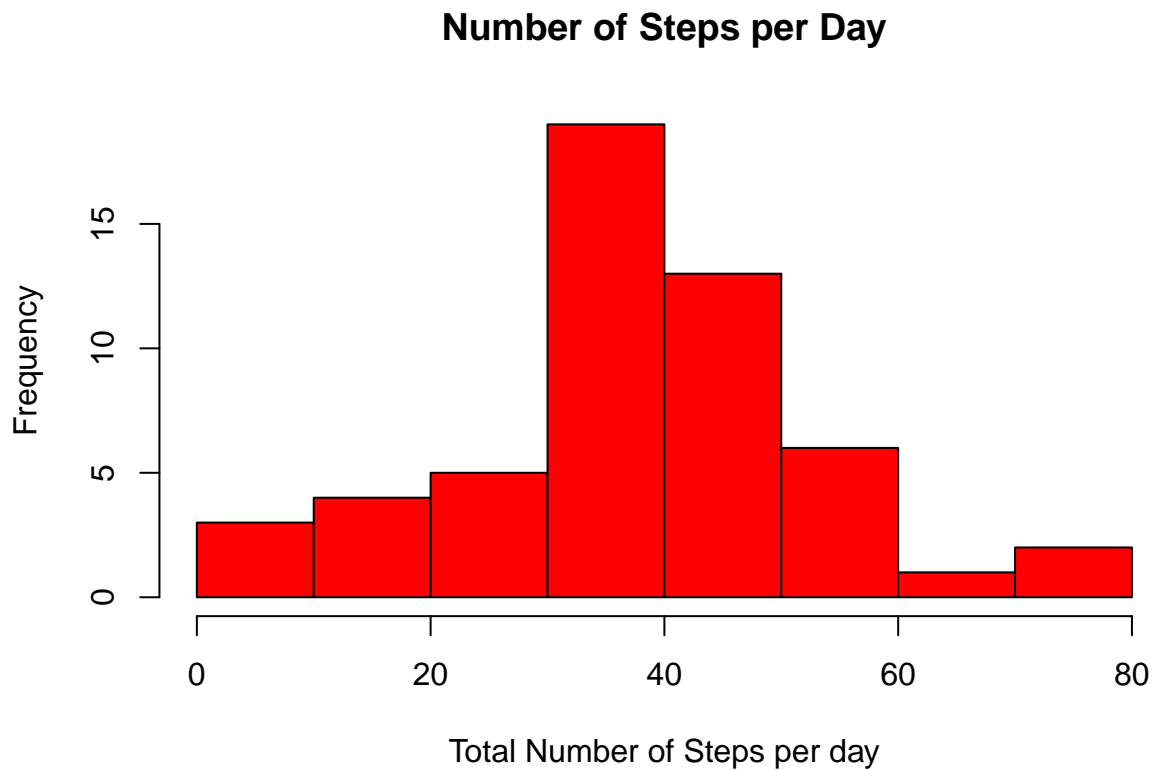## Loading and preprocessing the data

```
setwd("C:\\Users\\Dario\\Documents\\GitHub\\RepData_PeerAssessment1")
suppressMessages(library(dplyr))
activity <- read.table(unz("repdata_data_activity.zip", "activity.csv"),
                       header = TRUE, sep = ",")
```

What is mean total number of steps taken per day?

```
stepsPerDay <- activity %>% select(date, steps) %>% group_by(date) %>%
  summarize(mean(steps, na.rm = TRUE))
names(stepsPerDay) <- c("date", "sum")
```

1. Make a histogram of the total number of steps taken each day

```
hist(stepsPerDay$sum,
     freq = TRUE,
     col = 'red',
     xlab = 'Total Number of Steps per day',
     breaks = 10,
     main = 'Number of Steps per Day')
```

Number of Steps per Day


```r
dev.copy(png, file = 'figures/plot1.png', height=480, width=480)
```

```
## png
##   3
```

```r
dev.off()
```

```
## pdf
##   2
```

```r
stepsPerDayMean <- mean(stepsPerDay$sum, na.rm = TRUE)
stepsPerDayMedian <- median(stepsPerDay$sum, na.rm = TRUE)
```

2. Calculate and report the mean and median total number of steps taken per day

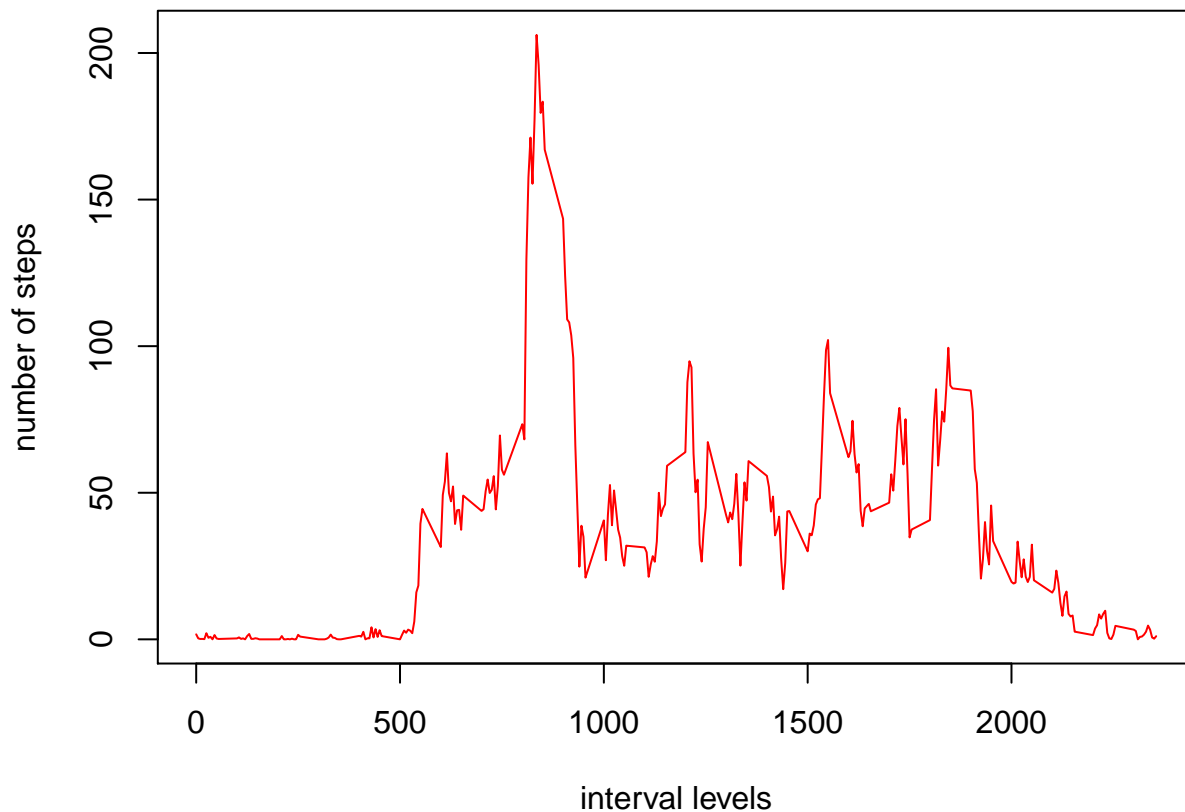| Variable	mean	median
Steps Per Day	37.3826	37.3785

What is the average daily activity pattern?

1. Make a time series plot of the 5-minute interval and the ave number steps

```
intervalPerDayMean <- activity %>% group_by(interval) %>%
  summarize(mean(steps, na.rm = TRUE))
names(intervalPerDayMean) <- c("interval", "MeanSteps")
intervalLevels <- levels(factor(activity$interval))
par(mar = c(4.5,4.5,1,1))
plot(intervalPerDayMean$MeanSteps ~ intervalLevels, type = "l",
     ylab = "number of steps", xlab = "interval levels", col = "red")
```



```
dev.copy(png, file = 'figures/plot2.png', height=480, width=960)
```

```
## png
##   3
```

```
dev.off()
```

```
## pdf
##   2
```

2. Which 5-minute interval on average contains the maximum number of steps

```
max5MinMeanValue <- max(intervalPerDayMean$MeanSteps)
max5MinMeanRow <- which(intervalPerDayMean$MeanSteps == max5MinMeanValue)
max5MinMeanInterval <- intervalPerDayMean[row(intervalPerDayMean) ==
                                          max5MinMeanRow,][1,1]
```

The (835) 5-minute interval contains 206 maximum number of steps in average across all days:

3

Imputing missing values

1. Calculate and report the total number of missing values in the dataset

```
iSteps <- which(is.na(activity[,1]) == TRUE)
jInterval <- activity[iSteps,3]
activity[iSteps, 1] <- intervalPerDayMean[,2]
```

Total number of missing values rows in the dataset is: 2304

2. Devise a strategy for filling in all of the missing values in the dataset.

- Strategy is to fill in the missing values with the average of all existing values in a particular day

```
missingvals = c(NA)
meanVector <- tbl_df(aggregate(activity$steps[!activity$steps %in% missingvals],
                                list(activity$date[!activity$steps %in% missingvals]), mean))
names(meanVector) <- c("date", "steps")
meanVector$date <- as.character(meanVector$date)
newActivity <- tbl_df(activity)
newActivity$date <- as.character(newActivity$date)


mutate(newActivity, steps = ifelse(steps == NA,
                                    meanVector$steps[newActivity$date ==
                                                     meanVector$date], steps))
```

```
## Source: local data frame [17,568 x 3]
##
##     steps        date interval
## 1      NA 2012-10-01        0
## 2      NA 2012-10-01        5
## 3      NA 2012-10-01       10
## 4      NA 2012-10-01       15
## 5      NA 2012-10-01       20
## 6      NA 2012-10-01       25
## 7      NA 2012-10-01       30
## 8      NA 2012-10-01       35
## 9      NA 2012-10-01       40
## 10     NA 2012-10-01       45
## ..    ...         ...      ...
```

```
newActivity$steps[newActivity$steps %in% missingvals] <-
  meanVector$steps[newActivity$date == meanVector$date]
```

3. Create a new dataset that is equal to the original dataset but missing values filled in

4.

Are there differences in activity patterns between weekdays and weekends?

iSteps

```
##     [1]    1    2    3    4    5    6    7    8    9   10   11
##    [12]   12   13   14   15   16   17   18   19   20   21   22
##    [23]   23   24   25   26   27   28   29   30   31   32   33
##    [34]   34   35   36   37   38   39   40   41   42   43   44
##    [45]   45   46   47   48   49   50   51   52   53   54   55
##    [56]   56   57   58   59   60   61   62   63   64   65   66
##    [67]   67   68   69   70   71   72   73   74   75   76   77
##    [78]   78   79   80   81   82   83   84   85   86   87   88
##    [89]   89   90   91   92   93   94   95   96   97   98   99
##   [100]  100  101  102  103  104  105  106  107  108  109  110
##   [111]  111  112  113  114  115  116  117  118  119  120  121
##   [122]  122  123  124  125  126  127  128  129  130  131  132
##   [133]  133  134  135  136  137  138  139  140  141  142  143
##   [144]  144  145  146  147  148  149  150  151  152  153  154
##   [155]  155  156  157  158  159  160  161  162  163  164  165
##   [166]  166  167  168  169  170  171  172  173  174  175  176
##   [177]  177  178  179  180  181  182  183  184  185  186  187
##   [188]  188  189  190  191  192  193  194  195  196  197  198
##   [199]  199  200  201  202  203  204  205  206  207  208  209
##   [210]  210  211  212  213  214  215  216  217  218  219  220
##   [221]  221  222  223  224  225  226  227  228  229  230  231
##   [232]  232  233  234  235  236  237  238  239  240  241  242
##   [243]  243  244  245  246  247  248  249  250  251  252  253
##   [254]  254  255  256  257  258  259  260  261  262  263  264
##   [265]  265  266  267  268  269  270  271  272  273  274  275
##   [276]  276  277  278  279  280  281  282  283  284  285  286
##   [287]  287  288 2017 2018 2019 2020 2021 2022 2023 2024 2025
##   [298] 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036
##   [309] 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047
##   [320] 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058
##   [331] 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069
##   [342] 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080
##   [353] 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091
##   [364] 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102
##   [375] 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113
##   [386] 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124
##   [397] 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135
##   [408] 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146
##   [419] 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157
##   [430] 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168
##   [441] 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179
##   [452] 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190
##   [463] 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201
##   [474] 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212
##   [485] 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223
##   [496] 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234
##   [507] 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245
##   [518] 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256
##   [529] 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267
##   [540] 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278
##   [551] 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289
```

```
## [562]  2290  2291  2292  2293  2294  2295  2296  2297  2298  2299  2300
## [573]  2301  2302  2303  2304  8929  8930  8931  8932  8933  8934  8935
## [584]  8936  8937  8938  8939  8940  8941  8942  8943  8944  8945  8946
## [595]  8947  8948  8949  8950  8951  8952  8953  8954  8955  8956  8957
## [606]  8958  8959  8960  8961  8962  8963  8964  8965  8966  8967  8968
## [617]  8969  8970  8971  8972  8973  8974  8975  8976  8977  8978  8979
## [628]  8980  8981  8982  8983  8984  8985  8986  8987  8988  8989  8990
## [639]  8991  8992  8993  8994  8995  8996  8997  8998  8999  9000  9001
## [650]  9002  9003  9004  9005  9006  9007  9008  9009  9010  9011  9012
## [661]  9013  9014  9015  9016  9017  9018  9019  9020  9021  9022  9023
## [672]  9024  9025  9026  9027  9028  9029  9030  9031  9032  9033  9034
## [683]  9035  9036  9037  9038  9039  9040  9041  9042  9043  9044  9045
## [694]  9046  9047  9048  9049  9050  9051  9052  9053  9054  9055  9056
## [705]  9057  9058  9059  9060  9061  9062  9063  9064  9065  9066  9067
## [716]  9068  9069  9070  9071  9072  9073  9074  9075  9076  9077  9078
## [727]  9079  9080  9081  9082  9083  9084  9085  9086  9087  9088  9089
## [738]  9090  9091  9092  9093  9094  9095  9096  9097  9098  9099  9100
## [749]  9101  9102  9103  9104  9105  9106  9107  9108  9109  9110  9111
## [760]  9112  9113  9114  9115  9116  9117  9118  9119  9120  9121  9122
## [771]  9123  9124  9125  9126  9127  9128  9129  9130  9131  9132  9133
## [782]  9134  9135  9136  9137  9138  9139  9140  9141  9142  9143  9144
## [793]  9145  9146  9147  9148  9149  9150  9151  9152  9153  9154  9155
## [804]  9156  9157  9158  9159  9160  9161  9162  9163  9164  9165  9166
## [815]  9167  9168  9169  9170  9171  9172  9173  9174  9175  9176  9177
## [826]  9178  9179  9180  9181  9182  9183  9184  9185  9186  9187  9188
## [837]  9189  9190  9191  9192  9193  9194  9195  9196  9197  9198  9199
## [848]  9200  9201  9202  9203  9204  9205  9206  9207  9208  9209  9210
## [859]  9211  9212  9213  9214  9215  9216  9793  9794  9795  9796  9797
## [870]  9798  9799  9800  9801  9802  9803  9804  9805  9806  9807  9808
## [881]  9809  9810  9811  9812  9813  9814  9815  9816  9817  9818  9819
## [892]  9820  9821  9822  9823  9824  9825  9826  9827  9828  9829  9830
## [903]  9831  9832  9833  9834  9835  9836  9837  9838  9839  9840  9841
## [914]  9842  9843  9844  9845  9846  9847  9848  9849  9850  9851  9852
## [925]  9853  9854  9855  9856  9857  9858  9859  9860  9861  9862  9863
## [936]  9864  9865  9866  9867  9868  9869  9870  9871  9872  9873  9874
## [947]  9875  9876  9877  9878  9879  9880  9881  9882  9883  9884  9885
## [958]  9886  9887  9888  9889  9890  9891  9892  9893  9894  9895  9896
## [969]  9897  9898  9899  9900  9901  9902  9903  9904  9905  9906  9907
## [980]  9908  9909  9910  9911  9912  9913  9914  9915  9916  9917  9918
## [991]  9919  9920  9921  9922  9923  9924  9925  9926  9927  9928  9929
## [1002] 9930  9931  9932  9933  9934  9935  9936  9937  9938  9939  9940
## [1013] 9941  9942  9943  9944  9945  9946  9947  9948  9949  9950  9951
## [1024] 9952  9953  9954  9955  9956  9957  9958  9959  9960  9961  9962
## [1035] 9963  9964  9965  9966  9967  9968  9969  9970  9971  9972  9973
## [1046] 9974  9975  9976  9977  9978  9979  9980  9981  9982  9983  9984
## [1057] 9985  9986  9987  9988  9989  9990  9991  9992  9993  9994  9995
## [1068] 9996  9997  9998  9999 10000 10001 10002 10003 10004 10005 10006
## [1079] 10007 10008 10009 10010 10011 10012 10013 10014 10015 10016 10017
## [1090] 10018 10019 10020 10021 10022 10023 10024 10025 10026 10027 10028
## [1101] 10029 10030 10031 10032 10033 10034 10035 10036 10037 10038 10039
## [1112] 10040 10041 10042 10043 10044 10045 10046 10047 10048 10049 10050
## [1123] 10051 10052 10053 10054 10055 10056 10057 10058 10059 10060 10061
## [1134] 10062 10063 10064 10065 10066 10067 10068 10069 10070 10071 10072
## [1145] 10073 10074 10075 10076 10077 10078 10079 10080 11233 11234 11235
```

```
## [1156] 11236 11237 11238 11239 11240 11241 11242 11243 11244 11245 11246
## [1167] 11247 11248 11249 11250 11251 11252 11253 11254 11255 11256 11257
## [1178] 11258 11259 11260 11261 11262 11263 11264 11265 11266 11267 11268
## [1189] 11269 11270 11271 11272 11273 11274 11275 11276 11277 11278 11279
## [1200] 11280 11281 11282 11283 11284 11285 11286 11287 11288 11289 11290
## [1211] 11291 11292 11293 11294 11295 11296 11297 11298 11299 11300 11301
## [1222] 11302 11303 11304 11305 11306 11307 11308 11309 11310 11311 11312
## [1233] 11313 11314 11315 11316 11317 11318 11319 11320 11321 11322 11323
## [1244] 11324 11325 11326 11327 11328 11329 11330 11331 11332 11333 11334
## [1255] 11335 11336 11337 11338 11339 11340 11341 11342 11343 11344 11345
## [1266] 11346 11347 11348 11349 11350 11351 11352 11353 11354 11355 11356
## [1277] 11357 11358 11359 11360 11361 11362 11363 11364 11365 11366 11367
## [1288] 11368 11369 11370 11371 11372 11373 11374 11375 11376 11377 11378
## [1299] 11379 11380 11381 11382 11383 11384 11385 11386 11387 11388 11389
## [1310] 11390 11391 11392 11393 11394 11395 11396 11397 11398 11399 11400
## [1321] 11401 11402 11403 11404 11405 11406 11407 11408 11409 11410 11411
## [1332] 11412 11413 11414 11415 11416 11417 11418 11419 11420 11421 11422
## [1343] 11423 11424 11425 11426 11427 11428 11429 11430 11431 11432 11433
## [1354] 11434 11435 11436 11437 11438 11439 11440 11441 11442 11443 11444
## [1365] 11445 11446 11447 11448 11449 11450 11451 11452 11453 11454 11455
## [1376] 11456 11457 11458 11459 11460 11461 11462 11463 11464 11465 11466
## [1387] 11467 11468 11469 11470 11471 11472 11473 11474 11475 11476 11477
## [1398] 11478 11479 11480 11481 11482 11483 11484 11485 11486 11487 11488
## [1409] 11489 11490 11491 11492 11493 11494 11495 11496 11497 11498 11499
## [1420] 11500 11501 11502 11503 11504 11505 11506 11507 11508 11509 11510
## [1431] 11511 11512 11513 11514 11515 11516 11517 11518 11519 11520 11521
## [1442] 11522 11523 11524 11525 11526 11527 11528 11529 11530 11531 11532
## [1453] 11533 11534 11535 11536 11537 11538 11539 11540 11541 11542 11543
## [1464] 11544 11545 11546 11547 11548 11549 11550 11551 11552 11553 11554
## [1475] 11555 11556 11557 11558 11559 11560 11561 11562 11563 11564 11565
## [1486] 11566 11567 11568 11569 11570 11571 11572 11573 11574 11575 11576
## [1497] 11577 11578 11579 11580 11581 11582 11583 11584 11585 11586 11587
## [1508] 11588 11589 11590 11591 11592 11593 11594 11595 11596 11597 11598
## [1519] 11599 11600 11601 11602 11603 11604 11605 11606 11607 11608 11609
## [1530] 11610 11611 11612 11613 11614 11615 11616 11617 11618 11619 11620
## [1541] 11621 11622 11623 11624 11625 11626 11627 11628 11629 11630 11631
## [1552] 11632 11633 11634 11635 11636 11637 11638 11639 11640 11641 11642
## [1563] 11643 11644 11645 11646 11647 11648 11649 11650 11651 11652 11653
## [1574] 11654 11655 11656 11657 11658 11659 11660 11661 11662 11663 11664
## [1585] 11665 11666 11667 11668 11669 11670 11671 11672 11673 11674 11675
## [1596] 11676 11677 11678 11679 11680 11681 11682 11683 11684 11685 11686
## [1607] 11687 11688 11689 11690 11691 11692 11693 11694 11695 11696 11697
## [1618] 11698 11699 11700 11701 11702 11703 11704 11705 11706 11707 11708
## [1629] 11709 11710 11711 11712 11713 11714 11715 11716 11717 11718 11719
## [1640] 11720 11721 11722 11723 11724 11725 11726 11727 11728 11729 11730
## [1651] 11731 11732 11733 11734 11735 11736 11737 11738 11739 11740 11741
## [1662] 11742 11743 11744 11745 11746 11747 11748 11749 11750 11751 11752
## [1673] 11753 11754 11755 11756 11757 11758 11759 11760 11761 11762 11763
## [1684] 11764 11765 11766 11767 11768 11769 11770 11771 11772 11773 11774
## [1695] 11775 11776 11777 11778 11779 11780 11781 11782 11783 11784 11785
## [1706] 11786 11787 11788 11789 11790 11791 11792 11793 11794 11795 11796
## [1717] 11797 11798 11799 11800 11801 11802 11803 11804 11805 11806 11807
## [1728] 11808 12673 12674 12675 12676 12677 12678 12679 12680 12681 12682
## [1739] 12683 12684 12685 12686 12687 12688 12689 12690 12691 12692 12693
```

```
## [1750] 12694 12695 12696 12697 12698 12699 12700 12701 12702 12703 12704
## [1761] 12705 12706 12707 12708 12709 12710 12711 12712 12713 12714 12715
## [1772] 12716 12717 12718 12719 12720 12721 12722 12723 12724 12725 12726
## [1783] 12727 12728 12729 12730 12731 12732 12733 12734 12735 12736 12737
## [1794] 12738 12739 12740 12741 12742 12743 12744 12745 12746 12747 12748
## [1805] 12749 12750 12751 12752 12753 12754 12755 12756 12757 12758 12759
## [1816] 12760 12761 12762 12763 12764 12765 12766 12767 12768 12769 12770
## [1827] 12771 12772 12773 12774 12775 12776 12777 12778 12779 12780 12781
## [1838] 12782 12783 12784 12785 12786 12787 12788 12789 12790 12791 12792
## [1849] 12793 12794 12795 12796 12797 12798 12799 12800 12801 12802 12803
## [1860] 12804 12805 12806 12807 12808 12809 12810 12811 12812 12813 12814
## [1871] 12815 12816 12817 12818 12819 12820 12821 12822 12823 12824 12825
## [1882] 12826 12827 12828 12829 12830 12831 12832 12833 12834 12835 12836
## [1893] 12837 12838 12839 12840 12841 12842 12843 12844 12845 12846 12847
## [1904] 12848 12849 12850 12851 12852 12853 12854 12855 12856 12857 12858
## [1915] 12859 12860 12861 12862 12863 12864 12865 12866 12867 12868 12869
## [1926] 12870 12871 12872 12873 12874 12875 12876 12877 12878 12879 12880
## [1937] 12881 12882 12883 12884 12885 12886 12887 12888 12889 12890 12891
## [1948] 12892 12893 12894 12895 12896 12897 12898 12899 12900 12901 12902
## [1959] 12903 12904 12905 12906 12907 12908 12909 12910 12911 12912 12913
## [1970] 12914 12915 12916 12917 12918 12919 12920 12921 12922 12923 12924
## [1981] 12925 12926 12927 12928 12929 12930 12931 12932 12933 12934 12935
## [1992] 12936 12937 12938 12939 12940 12941 12942 12943 12944 12945 12946
## [2003] 12947 12948 12949 12950 12951 12952 12953 12954 12955 12956 12957
## [2014] 12958 12959 12960 17281 17282 17283 17284 17285 17286 17287 17288
## [2025] 17289 17290 17291 17292 17293 17294 17295 17296 17297 17298 17299
## [2036] 17300 17301 17302 17303 17304 17305 17306 17307 17308 17309 17310
## [2047] 17311 17312 17313 17314 17315 17316 17317 17318 17319 17320 17321
## [2058] 17322 17323 17324 17325 17326 17327 17328 17329 17330 17331 17332
## [2069] 17333 17334 17335 17336 17337 17338 17339 17340 17341 17342 17343
## [2080] 17344 17345 17346 17347 17348 17349 17350 17351 17352 17353 17354
## [2091] 17355 17356 17357 17358 17359 17360 17361 17362 17363 17364 17365
## [2102] 17366 17367 17368 17369 17370 17371 17372 17373 17374 17375 17376
## [2113] 17377 17378 17379 17380 17381 17382 17383 17384 17385 17386 17387
## [2124] 17388 17389 17390 17391 17392 17393 17394 17395 17396 17397 17398
## [2135] 17399 17400 17401 17402 17403 17404 17405 17406 17407 17408 17409
## [2146] 17410 17411 17412 17413 17414 17415 17416 17417 17418 17419 17420
## [2157] 17421 17422 17423 17424 17425 17426 17427 17428 17429 17430 17431
## [2168] 17432 17433 17434 17435 17436 17437 17438 17439 17440 17441 17442
## [2179] 17443 17444 17445 17446 17447 17448 17449 17450 17451 17452 17453
## [2190] 17454 17455 17456 17457 17458 17459 17460 17461 17462 17463 17464
## [2201] 17465 17466 17467 17468 17469 17470 17471 17472 17473 17474 17475
## [2212] 17476 17477 17478 17479 17480 17481 17482 17483 17484 17485 17486
## [2223] 17487 17488 17489 17490 17491 17492 17493 17494 17495 17496 17497
## [2234] 17498 17499 17500 17501 17502 17503 17504 17505 17506 17507 17508
## [2245] 17509 17510 17511 17512 17513 17514 17515 17516 17517 17518 17519
## [2256] 17520 17521 17522 17523 17524 17525 17526 17527 17528 17529 17530
## [2267] 17531 17532 17533 17534 17535 17536 17537 17538 17539 17540 17541
## [2278] 17542 17543 17544 17545 17546 17547 17548 17549 17550 17551 17552
## [2289] 17553 17554 17555 17556 17557 17558 17559 17560 17561 17562 17563
## [2300] 17564 17565 17566 17567 17568
```

** Si las hay **