SD_dataset

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Some text

```
library(dplyr)
library(ggplot2)
library(reshape2)
setwd('C:/Users/katin/Desktop/Folder/STUDIA/DTU/Semestr I/Intro to ML/Project I')
SD <- read.csv('Speed Dating Data.csv')

# numdim(SDber of rows and columns
dim(SD)
```

```
## [1] 8378  195
```

```
# number of women
length(unique(SD$iid[which(SD$gender == 0)])) # 274
```

```
## [1] 274
```

```
# number of men
length(unique(SD$iid[which(SD$gender == 1)])) # 277
```

```
## [1] 277
```

```
274 + 277
```

```
## [1] 551
```

```
NAs <- sapply(SD, function(x) sum(is.na(x)))
sort(NAs[which(NAs > 0)])
```

```
##       id      pid     race   race_o  imprace imprelig     goal   go_out
##        1       10       63       73       79       79       79       79
##   sports tvsports exercise   dining  museums      art   hiking   gaming
##       79       79       79       79       79       79       79       79
## clubbing  reading       tv  theater   movies concerts    music shopping
##       79       79       79       79       79       79       79       79
##     yoga  attr1_1  sinc1_1 intel1_1  attr2_1  sinc2_1 intel2_1   fun2_1
##       79       79       79       79       79       79       79       79
## field_cd pf_o_att pf_o_sin pf_o_int   fun1_1   amb2_1  shar2_1      age
##       82       89       89       89       89       89       89       95
##     date pf_o_fun   amb1_1 exphappy    age_o  attr3_1  sinc3_1   fun3_1
##       97       98       99      101      104      105      105      105
## intel3_1   amb3_1 pf_o_amb  shar1_1 pf_o_sha career_c int_corr     attr
##      105      105      107      121      129      138      158      202
##   attr_o     like   like_o     sinc   sinc_o    intel  intel_o     prob
##      212      240      250      277      287      296      306      309
##   prob_o      fun    fun_o      met    met_o      amb    amb_o  satis_2
##      318      350      360      375      385      712      722      915
##   length  sinc1_2 intel1_2   fun1_2   amb1_2  shar1_2  attr3_2  sinc3_2
##      915      915      915      915      915      915      915      915
## intel3_2   fun3_2   amb3_2  attr1_2 numdat_2     shar   shar_o match_es
##      915      915      915      933      945     1067     1076     1173
## positin1  attr4_1  sinc4_1 intel4_1   fun4_1   amb4_1  shar4_1  attr4_2
##     1846     1889     1889     1889     1889     1889     1911     2603
##  sinc4_2 intel4_2   fun4_2   amb4_2  shar4_2  attr2_2  sinc2_2 intel2_2
##     2603     2603     2603     2603     2603     2603     2603     2603
##   fun2_2   amb2_2  shar2_2  attr5_1  sinc5_1 intel5_1   fun5_1   amb5_1
##     2603     2603     2603     3472     3472     3472     3472     3472
##  attr5_2  sinc5_2 intel5_2   fun5_2   amb5_2  attr1_s  sinc1_s intel1_s
##     4001     4001     4001     4001     4001     4282     4282     4282
##   fun1_s   amb1_s  shar1_s  attr3_s  sinc3_s intel3_s   fun3_s   amb3_s
##     4282     4282     4282     4378     4378     4378     4378     4378
## you_call them_cal   date_3  attr1_3  sinc1_3 intel1_3   fun1_3   amb1_3
##     4404     4404     4404     4404     4404     4404     4404     4404
##  shar1_3  attr3_3  sinc3_3 intel3_3   fun3_3   amb3_3  attr4_3  sinc4_3
##     4404     4404     4404     4404     4404     4404     5419     5419
## intel4_3   fun4_3   amb4_3  shar4_3  attr2_3  sinc2_3 intel2_3   fun2_3
##     5419     5419     5419     5419     5419     5419     5419     5419
##   amb2_3  attr7_3  sinc7_3 intel7_3   fun7_3   amb7_3  shar7_3  shar2_3
##     5419     6362     6362     6362     6362     6362     6362     6362
##  attr5_3  sinc5_3 intel5_3   fun5_3   amb5_3  attr7_2 intel7_2   fun7_2
##     6362     6362     6362     6362     6362     6394     6394     6394
##  shar7_2  sinc7_2   amb7_2   expnum numdat_3 num_in_3
##     6404     6423     6423     6578     6882     7710
```

```
#filling one missing value in last id row
SD[which(is.na(SD$id)), 1:2] <- 22

# filling 10 missing values in pid columns
SD[which(is.na(SD$pid)), 1:15] # partner's id - 7
```

```
##      iid id gender idg condtn wave round position positin1 order partner pid
## 1756 122  1      1   2      1    5    10        4       NA     6       7  NA
## 1766 123  2      1   4      1    5    10        4       NA    10       7  NA
## 1776 124  3      1   6      1    5    10        4       NA     3       7  NA
## 1786 125  4      1   8      1    5    10        4       NA     8       7  NA
## 1796 126  5      1  10      1    5    10        4       NA     1       7  NA
## 1806 127  6      1  12      1    5    10        4       NA     7       7  NA
## 1816 128  7      1  14      1    5    10        4       NA     9       7  NA
## 1826 129  8      1  15      1    5    10        4       NA     5       7  NA
## 1836 130  9      1  16      1    5    10        4       NA     2       7  NA
## 1846 131 10      1  18      1    5    10        4       NA     4       7  NA
##      match int_corr samerace
## 1756     0    -0.12        0
## 1766     0    -0.29        0
## 1776     0    -0.05        0
## 1786     0     0.15        0
## 1796     0     0.01        0
## 1806     0     0.38        0
## 1816     0    -0.05        0
## 1826     0     0.09        0
## 1836     0    -0.40        0
## 1846     0    -0.14        0
```

```
SD[which(SD$id == 7 & SD$wave == 5), 1:2] # we have to fill these 10 NAs with 128
```

```
##      iid id
## 1807 128  7
## 1808 128  7
## 1809 128  7
## 1810 128  7
## 1811 128  7
## 1812 128  7
## 1813 128  7
## 1814 128  7
## 1815 128  7
## 1816 128  7
```

```
SD[which(is.na(SD$pid)), 'pid'] <- 128

# adding one column with explanation for race column (matching index with race names)
race_idx <- unique(SD$race)
race_val <- c('Asian', 'European', 'Other', 'Latino', 'Black', NA)
SD$race_explained <- race_val[match(SD$race, race_idx)]

# adding one column with explanation for field_cd column (matching index with race names)
# DISCUSS WITH ALVILS IMPUTING DATA INTO field_cd as 9 (because field is Operations Research)
field_idx <- c(1:18, NA)
field_val <- c('Law', 'Math', 'Social Science, Psychologist', 'Medical Science/Pharmaceuticals/Bio Tech
               'Engineering', 'English/Creative Writing/ Journalism', 'History/Religion/Philosophy',
              'Business/Econ/Finance', 'Education, Academia', 'Biological Sciences/Chemistry/Physics',
              'Social Work', 'Undergrad/undecided', 'Political Science/International Affairs',
              'Film', 'Fine Arts/Arts Administration', 'Languages', 'Architecture', 'Other', 'Other')
SD$field_explained <- field_val[match(SD$field_cd, field_idx)]




#sum(is.na(field_df$field_cd))

# converting income from string to numeric
SD$income <- as.numeric(gsub(',', "", SD$income, fixed = T))

sum(is.na(SD$income))
```

```
## [1] 4099
```

```
unique(SD$field_cd)
```

```
##  [1]  1  2 13  8  5  9  3 11 NA 12  4  7  6 10 14 16 15 17 18
```

```
summary(SD[SD$wave >= 6 & SD$wave <= 9,129:134])
```

```
##     attr1_2         sinc1_2         intel1_2         fun1_2     
##  Min.   :10.00   Min.   : 5.00   Min.   :13.95   Min.   :11.11  
##  1st Qu.:15.38   1st Qu.:16.07   1st Qu.:17.39   1st Qu.:15.69  
##  Median :16.67   Median :17.65   Median :18.52   Median :17.78  
##  Mean   :17.45   Mean   :17.36   Mean   :18.79   Mean   :17.34  
##  3rd Qu.:19.05   3rd Qu.:19.15   3rd Qu.:20.00   3rd Qu.:18.75  
##  Max.   :26.32   Max.   :23.81   Max.   :25.00   Max.   :25.00  
##  NA's   :164     NA's   :164     NA's   :164     NA's   :164    
##      amb1_2         shar1_2     
##  Min.   : 2.50   Min.   : 4.76  
##  1st Qu.:12.77   1st Qu.:12.96  
##  Median :15.38   Median :14.58  
##  Mean   :14.65   Mean   :14.40  
##  3rd Qu.:16.67   3rd Qu.:16.67  
##  Max.   :22.22   Max.   :22.50  
##  NA's   :164     NA's   :164
```

```
# Waves 6 - 9:
# attr4_1 - shar4_1 have values between 0 and 10
# attr2_1 - shar2_1 OK
# attr1_2 - shar1_2 OK
```

```
# Age analysis
sum(is.na(SD$age))
```

```
## [1] 95
```

```
SD[is.na(SD$age), 1:10]
```

```
##      iid id gender idg condtn wave round position positin1 order
## 829   58  3      0   5      1    3    10        7       NA     9
## 830   58  3      0   5      1    3    10        7       NA     5
## 831   58  3      0   5      1    3    10        7       NA    10
## 832   58  3      0   5      1    3    10        7       NA     1
## 833   58  3      0   5      1    3    10        7       NA     6
## 834   58  3      0   5      1    3    10        7       NA     4
## 835   58  3      0   5      1    3    10        7       NA     3
## 836   58  3      0   5      1    3    10        7       NA     7
## 837   58  3      0   5      1    3    10        7       NA     2
## 838   58  3      0   5      1    3    10        7       NA     8
## 839   59  4      0   7      1    3    10        8       NA    10
## 840   59  4      0   7      1    3    10        8       NA     6
## 841   59  4      0   7      1    3    10        8       NA     1
## 842   59  4      0   7      1    3    10        8       NA     2
## 843   59  4      0   7      1    3    10        8       NA     7
## 844   59  4      0   7      1    3    10        8       NA     5
## 845   59  4      0   7      1    3    10        8       NA     4
## 846   59  4      0   7      1    3    10        8       NA     8
## 847   59  4      0   7      1    3    10        8       NA     3
## 848   59  4      0   7      1    3    10        8       NA     9
## 1817 129  8      1  15      1    5    10        6       NA     7
## 1818 129  8      1  15      1    5    10        9       NA    10
## 1819 129  8      1  15      1    5    10        7       NA     8
## 1820 129  8      1  15      1    5    10        1       NA     2
## 1821 129  8      1  15      1    5    10        8       NA     9
## 1822 129  8      1  15      1    5    10        2       NA     3
## 1823 129  8      1  15      1    5    10        5       NA     6
## 1824 129  8      1  15      1    5    10        3       NA     4
## 1825 129  8      1  15      1    5    10       10       NA     1
## 1826 129  8      1  15      1    5    10        4       NA     5
## 1867 136  6      0   8      1    6     5        5        5     3
## 1868 136  6      0   8      1    6     5        5        5     5
## 1869 136  6      0   8      1    6     5        5        5     1
## 1870 136  6      0   8      1    6     5        5        5     2
## 1871 136  6      0   8      1    6     5        5        5     4
## 5005 339  8      1  16      1   13    10        1        1     1
## 5006 339  8      1  16      1   13    10        5        5     5
## 5007 339  8      1  16      1   13    10        4        4     4
## 5008 339  8      1  16      1   13    10        6        6     6
## 5009 339  8      1  16      1   13    10        3        3     3
## 5010 339  8      1  16      1   13    10        9        9     9
## 5011 339  8      1  16      1   13    10        2        2     2
## 5012 339  8      1  16      1   13    10       10       10    10
## 5013 339  8      1  16      1   13    10        7        7     7
## 5014 339  8      1  16      1   13    10        8        8     8
## 5015 340  9      1  18      1   13    10        1        1     9
## 5016 340  9      1  18      1   13    10        5        5     3
## 5017 340  9      1  18      1   13    10        4        4     2
## 5018 340  9      1  18      1   13    10        6        6     4
## 5019 340  9      1  18      1   13    10        3        3     1
## 5020 340  9      1  18      1   13    10        9        9     7
## 5021 340  9      1  18      1   13    10        2        2    10
## 5022 340  9      1  18      1   13    10       10       10     8
## 5023 340  9      1  18      1   13    10        7        7     5
## 5024 340  9      1  18      1   13    10        8        8     6
## 5115 346  6      0  11      2   14    18       10       10     7
## 5116 346  6      0  11      2   14    18       10       10     1
## 5117 346  6      0  11      2   14    18       10       10    16
## 5118 346  6      0  11      2   14    18       10       10    18
## 5119 346  6      0  11      2   14    18       10       10    14
## 5120 346  6      0  11      2   14    18       10       10    17
## 5121 346  6      0  11      2   14    18       10       10    10
## 5122 346  6      0  11      2   14    18       10       10     8
## 5123 346  6      0  11      2   14    18       10       10    12
## 5124 346  6      0  11      2   14    18       10       10     6
## 5125 346  6      0  11      2   14    18       10       10     9
## 5126 346  6      0  11      2   14    18       10       10     4
## 5127 346  6      0  11      2   14    18       10       10     5
## 5128 346  6      0  11      2   14    18       10       10    15
## 5129 346  6      0  11      2   14    18       10       10    11
## 5130 346  6      0  11      2   14    18       10       10    13
## 5131 346  6      0  11      2   14    18       10       10     2
## 5132 346  6      0  11      2   14    18       10       10     3
## 7477 512  4      0   7      2   21    22        7        7    16
## 7478 512  4      0   7      2   21    22        7        7    13
## 7479 512  4      0   7      2   21    22        7        7     6
## 7480 512  4      0   7      2   21    22        7        7    15
## 7481 512  4      0   7      2   21    22        7        7    12
## 7482 512  4      0   7      2   21    22        7        7     5
## 7483 512  4      0   7      2   21    22        7        7    17
## 7484 512  4      0   7      2   21    22        7        7    22
## 7485 512  4      0   7      2   21    22        7        7     4
## 7486 512  4      0   7      2   21    22        7        7    19
## 7487 512  4      0   7      2   21    22        7        7     7
## 7488 512  4      0   7      2   21    22        7        7     2
## 7489 512  4       0    7       2    21     22         7         7     18
## 7490 512  4       0    7       2    21     22         7         7      3
## 7491 512  4       0    7       2    21     22         7         7     11
## 7492 512  4       0    7       2    21     22         7         7      8
## 7493 512  4       0    7       2    21     22         7         7     14
## 7494 512  4       0    7       2    21     22         7         7     21
## 7495 512  4       0    7       2    21     22         7         7      1
## 7496 512  4       0    7       2    21     22         7         7     10
## 7497 512  4       0    7       2    21     22         7         7      9
## 7498 512  4       0    7       2    21     22         7         7     20
```

```
age_df <- subset(SD, !duplicated(SD[,1])) %>%
  filter(!is.na(age)) %>%
  group_by(wave, gender) %>%
  summarize(Average_age = mean(age))
```

```
## `summarise()` regrouping output by 'wave' (override with `.groups` argument)
```

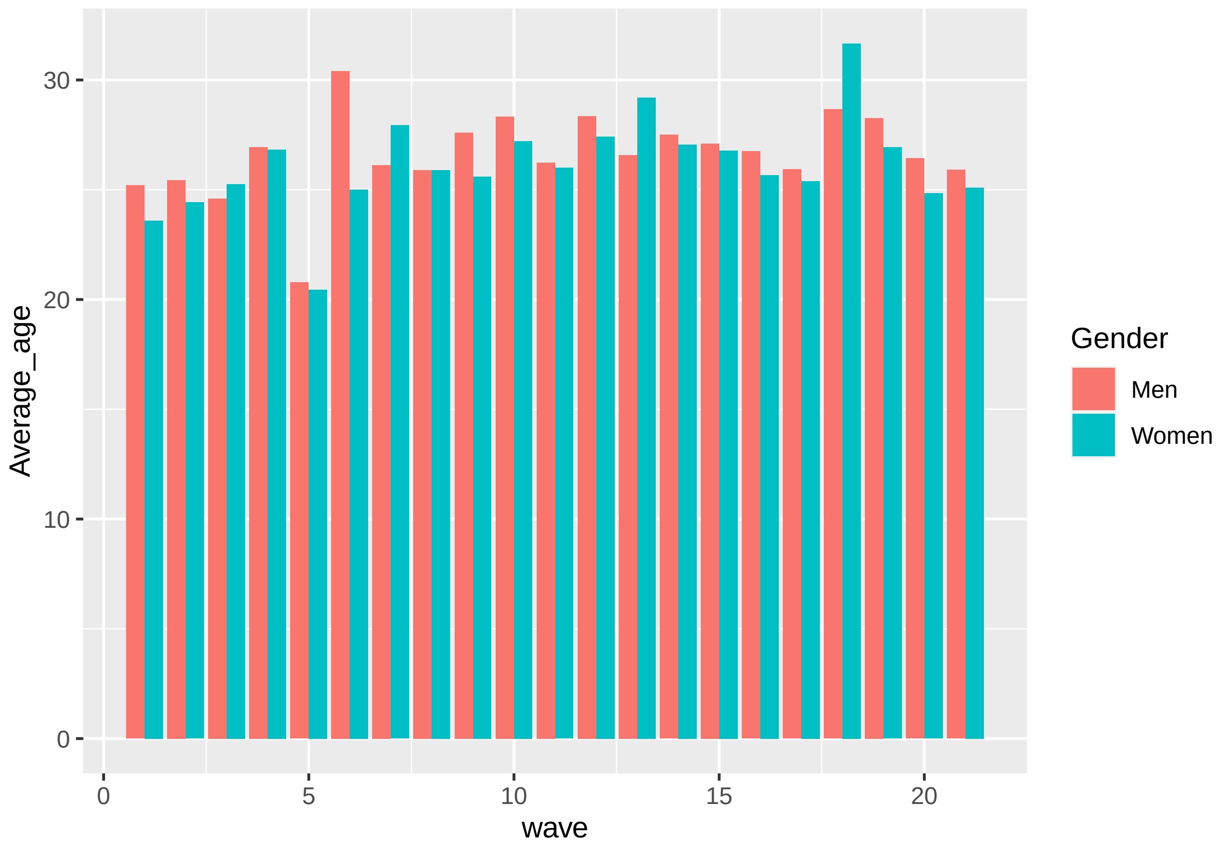
```
SD %>% nrow()
```

```
## [1] 8378
```

```
nrow(SD)
```

```
## [1] 8378
```

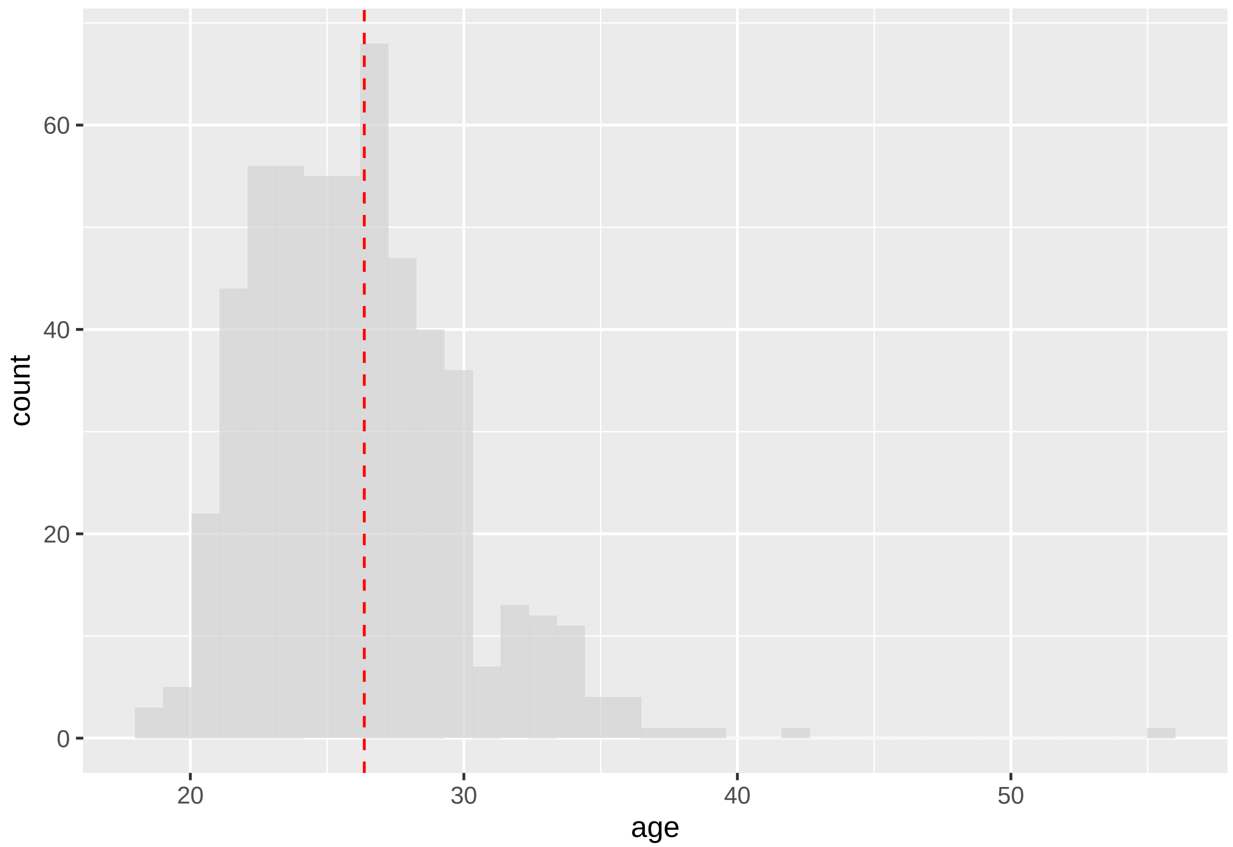
```
age_df$gender <- ifelse(age_df$gender == 0, 'Women', 'Men')

# Mean age per wave
age_df %>% ggplot(aes(x = wave, y = Average_age, fill = gender)) +
  geom_bar(stat = 'identity', position = 'dodge') +
  scale_fill_discrete(name = "Gender")
```



```r
age_df <- subset(SD, !duplicated(SD$iid), select = c(iid, gender, age)) %>%
  filter(!is.na(age)) %>%
  mutate(mean = mean(age))
age_df$gender <- ifelse(age_df$gender == 0, 'Women', 'Men')

# Histogram of age
max(unique(age_df$age)) - min(unique(age_df$age)) # number of bins
```

```
## [1] 37
```

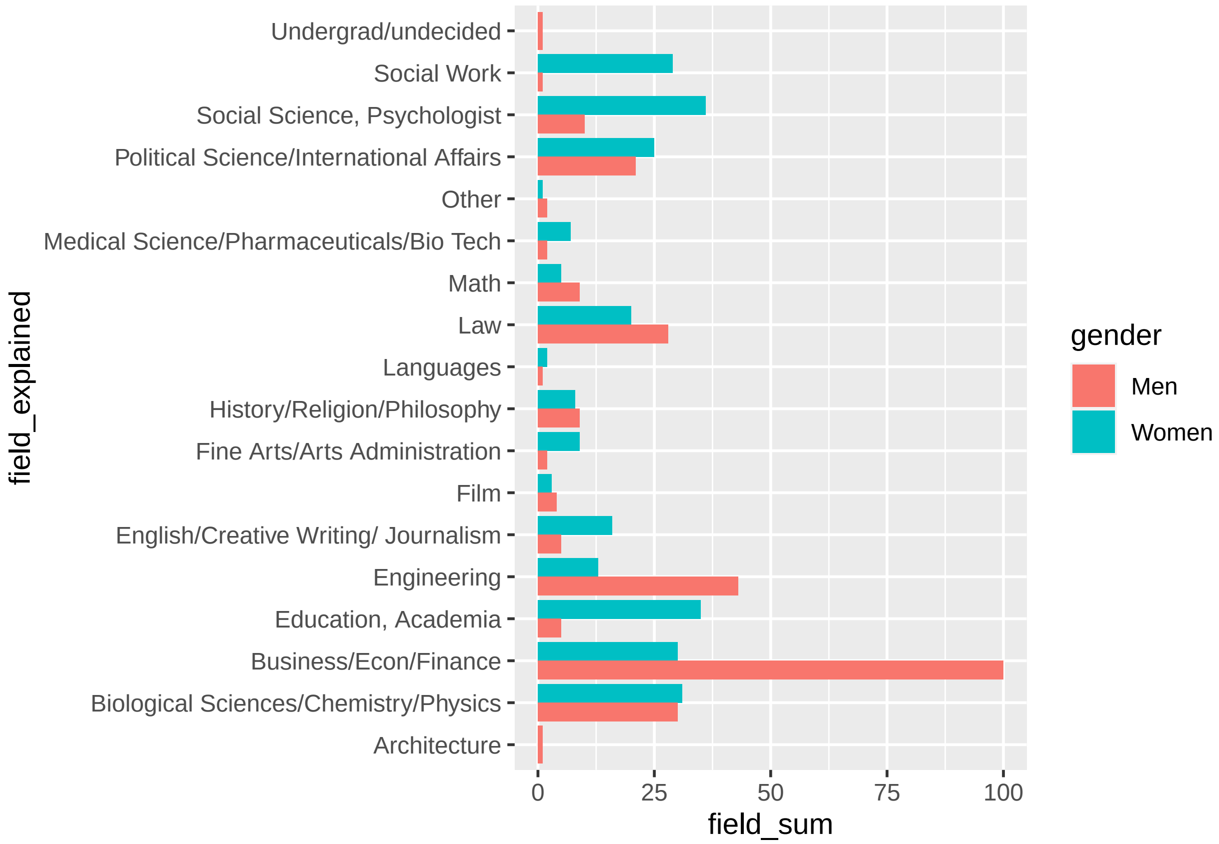
```r
age_df %>% ggplot(aes(x = age)) +
  geom_histogram(bins = 37, fill = 'lightgrey', position = 'identity', alpha = .7) +
  geom_vline(aes(xintercept = mean), col = 'red', linetype = 'dashed')
```



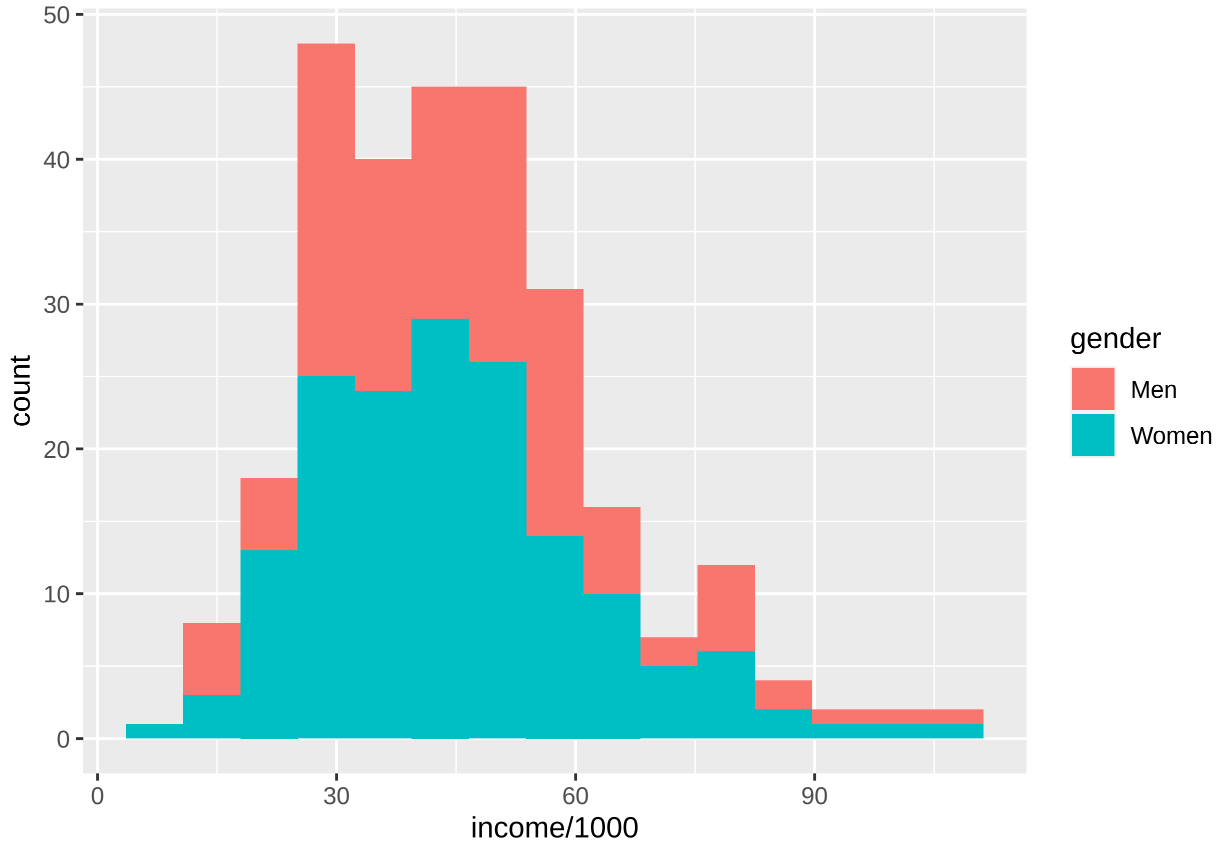
```r
# Field analysis
field_df <- subset(SD, !duplicated(SD$iid)) %>%
  filter(!is.na(field_cd)) %>%
  group_by(field_explained, gender) %>%
  summarize(field_sum = n())
```

```
## `summarise()` regrouping output by 'field_explained' (override with `.groups` argument)
```

```r
field_df$gender <- ifelse(field_df$gender == 0, 'Women', 'Men')

field_df %>% ggplot(aes(x = field_explained, y = field_sum, fill = gender)) +
  geom_bar(stat = 'identity', position = 'dodge') +
  coord_flip()
```



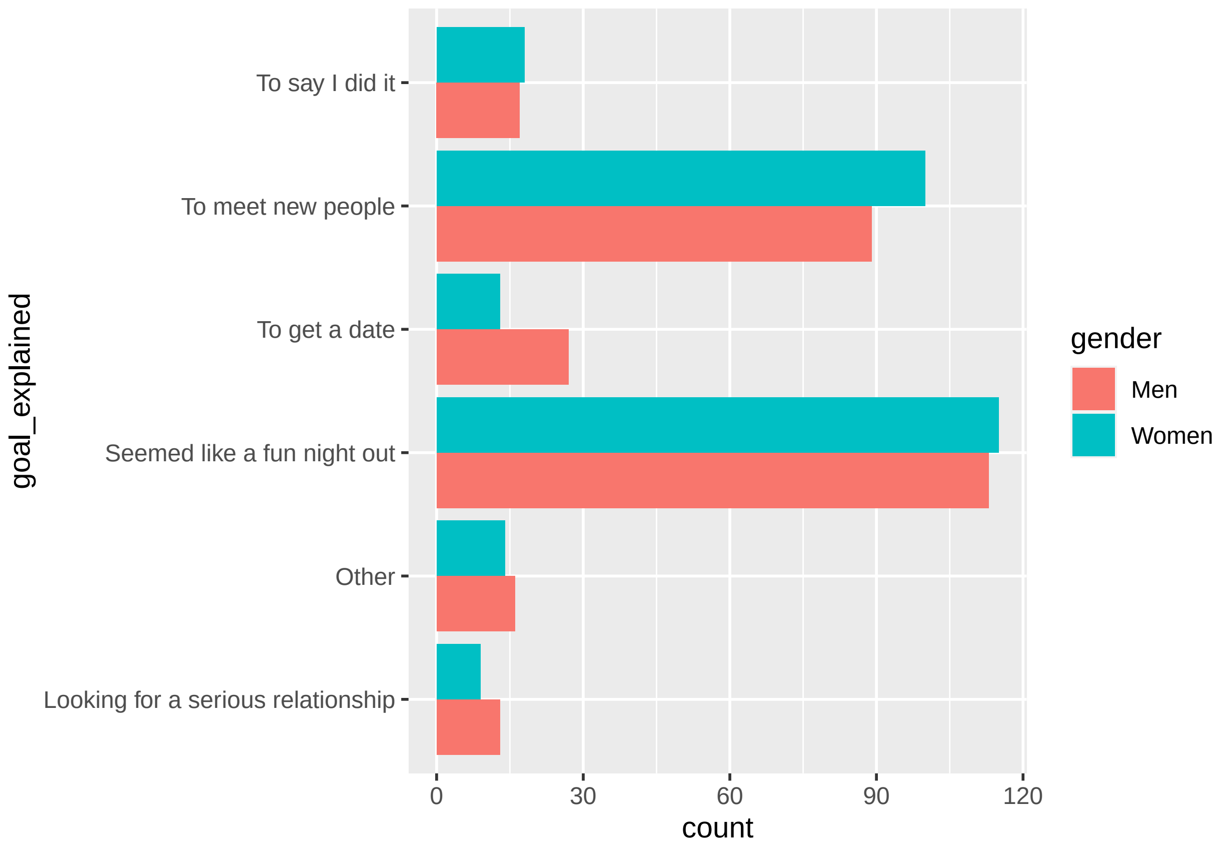
```
# Income
income_df <- subset(SD, !duplicated(SD$iid)) %>%
  filter(!is.na(income))

income_df$gender <- ifelse(income_df$gender == 0, 'Women', 'Men')

income_df %>% ggplot(aes(x = income/1000, fill = gender)) +
  geom_histogram(bins = 15)
```



```
# Purpose
goal_df <- subset(SD, !duplicated(SD$iid)) %>%
  filter(!is.na(goal)) %>%
  group_by(goal, gender) %>%
  summarise(count = n())
```

```
## `summarise()` regrouping output by 'goal' (override with `.groups` argument)
```

```
goal_df$gender <- ifelse(goal_df$gender == 0, 'Women', 'Men')

goal_idx <- unique(goal_df$goal)
goal_val <- c('Seemed like a fun night out', 'To meet new people', 'To get a date',
              'Looking for a serious relationship', 'To say I did it',  'Other')
goal_df$goal_explained <- goal_val[match(goal_df$goal, goal_idx)]

goal_df %>% ggplot(aes(x = goal_explained, y = count, fill = gender)) +
  geom_bar(stat = 'identity', position = 'dodge') +
  coord_flip()
```



```
# Importance of features for men/women
```