Ben Deatsman

Classwork 3a

```
In [5]: import pandas as pd
          df = pd.read_csv('heart.csv')
          df
Out[5]:
                                                                                                                                     thal disease
                               chest_pain rest_bp chol fbs
                                                                              rest_ecg max_hr exang old_peak slope
                                                                                                                           ca
                age
                        sex
                                                            1 left ventricular hypertrophy
                                                                                                     0
                 63
                       Male
                                    typical
                                               145
                                                     233
                                                                                            150
                                                                                                              2.3
                                                                                                                       3
                                                                                                                          0.0
                                                                                                                                    fixed
                                                                                                                                                0
                       Male asymptomatic
                                               160
                 67
                                                     286
                                                            0 left ventricular hypertrophy
                                                                                            108
                                                                                                     1
                                                                                                              1.5
                                                                                                                       2
                                                                                                                          3.0
             1
                                                                                                                                  normal
                                                                                                                          2.0 reversable
                 67
             2
                       Male asymptomatic
                                               120
                                                     229
                                                            0 left ventricular hypertrophy
                                                                                            129
                                                                                                     1
                                                                                                              2.6
                                                                                                                                                1
                 37
                                                     250
                                                            0
                                                                                                              3.5
                                                                                                                       3
                                                                                                                          0.0
                       Male
                                nonanginal
                                               130
                                                                                normal
                                                                                            187
                                                                                                     0
                                                                                                                                  normal
                                                            0 left ventricular hypertrophy
                                                                                            172
                                                                                                     0
                 41
                     Female
                                nontypical
                                               130
                                                     204
                                                                                                              1.4
                                                                                                                          0.0
                                                                                                                                  normal
                                                                                                                                                0
            •••
                         • • •
                 45
                                                     264
                                                                                            132
                                                                                                     0
                                                                                                                           0.0 reversable
          298
                       Male
                                    typical
                                               110
                                                            0
                                                                                                              1.2
                                                                                 normal
          299
                 68
                       Male asymptomatic
                                               144
                                                     193
                                                                                            141
                                                                                                     0
                                                                                                              3.4
                                                                                                                          2.0 reversable
                                                                                                                                                1
                                                                                normal
                 57
                                                            0
          300
                       Male asymptomatic
                                               130
                                                     131
                                                                                normal
                                                                                            115
                                                                                                     1
                                                                                                              1.2
                                                                                                                           1.0 reversable
                                                                                                                                                1
                                                            0 left ventricular hypertrophy
                 57 Female
                                                     236
                                                                                                              0.0
                                                                                                                       2 1.0
           301
                                nontypical
                                               130
                                                                                            174
                                                                                                                                  normal
          302
                 38
                                                     175
                                                            0
                                                                                                     0
                                                                                                                                                0
                       Male
                                nonanginal
                                               138
                                                                                            173
                                                                                                              0.0
                                                                                                                       1 NaN
                                                                                normal
                                                                                                                                  normal
         303 rows × 14 columns
In [6]: df['age'].head()
Out[6]:
                63
                67
          2
                67
          3
                37
                41
          Name: age, dtype: int64
         df[['age']].head()
Out[7]:
             age
              63
          0
               67
          2
              67
              37
               41
          4
In [8]: df[['age', 'sex', 'max_hr']].head()
Out[8]:
              age
                      sex max_hr
              63
                              150
          0
                     Male
              67
                     Male
                              108
          1
              67
                              129
          2
                     Male
               37
                     Male
                              187
          3
               41
                  Female
                              172
In [9]: #last age = 60
          first_25 = df.loc[0:24]
          first_25
Out[9]:
                              chest_pain rest_bp chol fbs
                                                                             rest_ecg max_hr exang old_peak slope ca
                                                                                                                                  thal disease
               age
                       sex
           0
               63
                      Male
                                              145
                                                   233
                                                           1 left ventricular hypertrophy
                                                                                           150
                                                                                                    0
                                                                                                             2.3
                                                                                                                     3 0.0
                                                                                                                                              0
                                  typical
                                                                                                                                  fixed
               67
                                                   286
                                                                                                    1
                                                                                                                     2 3.0
                                                                                                                                              1
            1
                      Male
                            asymptomatic
                                              160
                                                          0 left ventricular hypertrophy
                                                                                           108
                                                                                                             1.5
                                                                                                                                normal
               67
                                                                                                    1
           2
                      Male asymptomatic
                                              120
                                                   229
                                                          0 left ventricular hypertrophy
                                                                                           129
                                                                                                             2.6
                                                                                                                     2 2.0 reversable
                                                                                                                                              1
                37
                                                   250
                                                          0
                                                                                                    0
                                                                                                                     3 0.0
                                                                                                                                              0
                                              130
                                                                                                             3.5
            3
                      Male
                               nonanginal
                                                                                           187
                                                                               normal
                                                                                                                                normal
                                                   204
                                                          0 left ventricular hypertrophy
                41
                   Female
                               nontypical
                                              130
                                                                                           172
                                                                                                    0
                                                                                                             1.4
                                                                                                                     1 0.0
                                                                                                                                              0
           4
                                                                                                                                normal
                                                   236
                                                          0
                                                                                                    0
                                                                                                                                              0
            5
                56
                      Male
                               nontypical
                                              120
                                                                               normal
                                                                                           178
                                                                                                             8.0
                                                                                                                     1 0.0
                                                                                                                                normal
                                                                                                    0
                                                                                                                     3 2.0
                                                   268
                                                          0 left ventricular hypertrophy
                                                                                                             3.6
                   Female asymptomatic
                                              140
                                                                                           160
                                                                                                                                normal
                57
                                              120
                                                   354
                                                          0
                                                                                                    1
                                                                                                             0.6
                                                                                                                     1 0.0
                                                                                                                                              0
                   Female asymptomatic
                                                                                           163
                                                                                                                                normal
           7
                                                                               normal
                                                                                                    0
           8
                63
                      Male asymptomatic
                                              130
                                                   254
                                                          0 left ventricular hypertrophy
                                                                                           147
                                                                                                             1.4
                                                                                                                     2 1.0 reversable
                                                   203
                53
                                                                                                                     3 0.0 reversable
                      Male asymptomatic
                                              140
                                                           1 left ventricular hypertrophy
                                                                                                    1
                                                                                           155
                                                                                                             3.1
          10
                57
                      Male asymptomatic
                                                    192
                                                          0
                                                                                                    0
                                                                                                                     2 0.0
                                                                                                                                              0
                                              140
                                                                                           148
                                                                                                             0.4
                                                                                                                                  fixed
                                                                               normal
                56
                                                          0 left ventricular hypertrophy
                                                                                                    0
                                                                                                                                              0
                    Female
                               nontypical
                                              140
                                                   294
                                                                                           153
                                                                                                             1.3
                                                                                                                     2 0.0
                                                                                                                                normal
           11
                                                                                                    1
          12
                56
                      Male
                               nonanginal
                                              130
                                                   256
                                                           1 left ventricular hypertrophy
                                                                                           142
                                                                                                             0.6
                                                                                                                     2 1.0
                                                                                                                                  fixed
                                                                                                                                              1
                                                                                                                     1 0.0 reversable
               44
                                                   263
                                                          0
                                                                                                    0
                                                                                                                                              0
          13
                      Male
                                              120
                                                                                           173
                                                                                                             0.0
                               nontypical
                                                                               normal
               52
                                                   199
                                                                                                    0
                                                                                                                     1 0.0 reversable
                                                                                                                                              0
          14
                      Male
                               nonanginal
                                              172
                                                          1
                                                                                           162
                                                                                                             0.5
                                                                               normal
                57
                                                   168
                                                          0
                                                                                                    0
                                                                                                                     1 0.0
           15
                      Male
                               nonanginal
                                              150
                                                                                           174
                                                                                                             1.6
                                                                               normal
                                                                                                                                normal
                               nontypical
                48
                                                   229
                                                          0
                                                                                           168
                                                                                                    0
                                                                                                             1.0
          16
                      Male
                                              110
                                                                               normal
                                                                                                                     3 0.0 reversable
               54
                      Male asymptomatic
                                                   239
                                                          0
                                                                                           160
                                                                                                    0
                                                                                                             1.2
                                                                                                                     1 0.0
                                                                                                                                              0
           17
                                              140
                                                                               normal
                                                                                                                                normal
                                                                                                    0
                48
                    Female
                                                   275
                                                          0
                                                                                                             0.2
                                                                                                                     1 0.0
                                                                                                                                              0
                               nonanginal
                                              130
                                                                                           139
           18
                                                                               normal
                                                                                                                                normal
               49
                      Male
                               nontypical
                                              130
                                                   266
                                                          0
                                                                                           171
                                                                                                    0
                                                                                                             0.6
                                                                                                                     1 0.0
                                                                                                                                normal
                                                                                                                                              0
          19
                                                                               normal
                                                          0 left ventricular hypertrophy
               64
                                                                                                    1
                                                                                                                                              0
          20
                      Male
                                  typical
                                              110
                                                    211
                                                                                           144
                                                                                                             1.8
                                                                                                                     2 0.0
                                                                                                                                normal
               58
                   Female
                                                   283
                                                                                                    0
                                                                                                             1.0
                                                                                                                     1 0.0
           21
                                  typical
                                              150
                                                           1 left ventricular hypertrophy
                                                                                           162
                                                                                                                                normal
                58
                                                                                                    0
                                                                                                                     2 0.0
          22
                      Male
                               nontypical
                                              120
                                                   284
                                                          0 left ventricular hypertrophy
                                                                                           160
                                                                                                             1.8
                                                                                                                                normal
          23
                58
                      Male
                              nonanginal
                                              132
                                                   224
                                                          0 left ventricular hypertrophy
                                                                                           173
                                                                                                    0
                                                                                                             3.2
                                                                                                                     1 2.0 reversable
          24
               60
                                                   206
                                                          0 left ventricular hypertrophy
                                                                                           132
                                                                                                    1
                                                                                                             2.4
                                                                                                                     2 2.0 reversable
                                                                                                                                              1
                      Male asymptomatic
                                              130
In [10]: #209 observations
          df[df['age'] > 50]
Out[10]:
                               chest_pain rest_bp chol fbs
                                                                                                                                    thal disease
                                                                              rest_ecg max_hr exang old_peak slope ca
                age
                        sex
                                                            1 left ventricular hypertrophy
                                                                                                     0
                                                                                                                                               0
             0
                 63
                       Male
                                    typical
                                               145
                                                     233
                                                                                            150
                                                                                                              2.3
                                                                                                                       3 0.0
                                                                                                                                   fixed
             1
                 67
                       Male asymptomatic
                                               160
                                                     286
                                                            0 left ventricular hypertrophy
                                                                                            108
                                                                                                     1
                                                                                                              1.5
                                                                                                                       2 3.0
                                                                                                                                 normal
                                                                                                                                               1
                 67
                                                            0 left ventricular hypertrophy
             2
                       Male asymptomatic
                                               120
                                                     229
                                                                                            129
                                                                                                     1
                                                                                                              2.6
                                                                                                                       2 2.0 reversable
                                                                                                                                               1
                 56
                                                            0
                       Male
                                nontypical
                                               120
                                                     236
                                                                                            178
                                                                                                     0
                                                                                                              8.0
                                                                                                                       1 0.0
                                                                                                                                               0
             5
                                                                                normal
                                                                                                                                 normal
                     Female asymptomatic
                                                            0 left ventricular hypertrophy
                                                                                            160
                                                                                                     0
                                                                                                              3.6
                                                                                                                       3 2.0
                 62
                                               140
                                                     268
                                                                                                                                 normal
                                                                                                                                               1
             6
          296
                 59
                       Male asymptomatic
                                                     176
                                                            1 left ventricular hypertrophy
                                                                                             90
                                                                                                     0
                                                                                                              1.0
                                                                                                                       2 2.0
                                                                                                                                   fixed
                                                                                                                                               1
                                               164
                                                            0
                 57 Female asymptomatic
                                                     241
                                                                                                     1
                                                                                                              0.2
                                                                                                                       2 0.0 reversable
          297
                                               140
                                                                                            123
                                                                                                                                               1
                                                                                normal
          299
                 68
                       Male asymptomatic
                                               144
                                                     193
                                                                                            141
                                                                                                     0
                                                                                                              3.4
                                                                                                                       2 2.0
                                                                                                                             reversable
                                                                                                                                               1
                                                                                normal
                 57
          300
                       Male asymptomatic
                                               130
                                                     131
                                                            0
                                                                                normal
                                                                                            115
                                                                                                     1
                                                                                                              1.2
                                                                                                                       2 1.0 reversable
                                                                                                                                               1
                                                            0 left ventricular hypertrophy
                 57
                                                     236
                                                                                            174
                                                                                                     0
                                                                                                              0.0
                                                                                                                       2 1.0
                                                                                                                                               1
           301
                     Female
                                nontypical
                                               130
                                                                                                                                 normal
         209 rows × 14 columns
In [11]: # 139 observations
          df[(df['age'] > 50) \& (df['sex'] == 'Male')].shape
Out[11]: (139, 14)
In [32]: df1 = df[(df['age'] \le 50) & (df['sex'] == 'Female') & (df['disease'] == 1)]
In [40]: #There is 1 row and 3 columns
          df1[['chest_pain', 'chol', 'max_hr']]
Out[40]:
                 chest_pain chol max_hr
          113 asymptomatic 341
                                       136
```

In []: