HW5

Wei Ye

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Question1

```
A=[[1:10]',[1 1 0 0 0 1 1 1 0 1]',[100 95 125 14
```

```
A = 10×4
     1     1   100     4
     2     1    95     2
     3     0   125     4
     4     0   140     7
     5     0   110     4
     6     1    85     2
     7     1   110     4
     8     1   100     4
     9     0   125     6
    10     1   105     4
```

a. Using for-loops to create two vectors, one containing the salaries of only maile(sal_m), the other for the salaries of only females(sal_f)

```
sal_m=[];
sal_f=[];
for i =1:size(A,1)
    if A(i,2)==0
        sal_m=[sal_m;A(i,3)]
    end
```

```
end
```

```
sal_m = 125
sal_m = 2×1
   125
   140
sal_m = 3×1
   125
   140
   110
sal_m = 4×1
   125
   140
   110
   125
```

```
for i =1:size(A,1)
    if A(i,2)==1
        sal_f=[sal_f;A(i,3)]
    end
end
```

```
sal_f = 100
sal_f = 2×1
   100
    95
sal_f = 3×1
   100
```

```
     95
     85
sal_f = 4×1
    100
     95
     85
    110
sal_f = 5×1
    100
     95
     85
    110
    100
sal_f = 6×1
    100
     95
     85
    110
    100
    105
```

b. using for loops to creat 2 matrices that have in their first column as id of the individuals and in the second column as the corresponding salary. Do this for male(id_sal_m) and females(id_sal_f)

```
id_sal_m=[];
id_sal_f=[];
```

```
for i =1:size(A,1)
    if A(i,2)==0
        id_sal_m=[sal_m;A(i,3)]
    end
end
```

```
id_sal_m = 5×1
   125
   140
   110
   125
   125
id_sal_m = 5×1
   125
   140
   110
   125
   140
id_sal_m = 5×1
   125
   140
   110
   125
   110
id_sal_m = 5×1
   125
   140
   110
   125
```

```
   125
```

```
for j=1:size(A,1)
    if A(j,2)==1
        id_sal_f=[id_sal_f;A(j,[1,3])]
    end
end
```

```
id_sal_f = 1×2
     1   100
id_sal_f = 2×2
     1   100
     2    95
id_sal_f = 3×2
     1   100
     2    95
     6    85
id_sal_f = 4×2
     1   100
     2    95
     6    85
     7   110
id_sal_f = 5×2
     1   100
     2    95
     6    85
     7   110
     8   100
```

```
id_sal_f = 6×2
     1   100
     2    95
     6    85
     7   110
     8   100
    10   105
```

c. Separate the data into males and females and compute the descriptive statisticals for sal_m and sal_f. Estimate the mean, median,variance, standard deviation, max, min and number of obseravations. The matrix names should be desc_stat_male and desc_stat_female;

```
desc_stats_male=[mean(sal_m),median(sal_m),var(s
```

```
desc_stats_male = 1×7
  125.0000  125.0000  150.0000   12.2474  140.00
```

```
desc_stats_female=[mean(sal_f),median(sal_f),var
```

```
desc_stats_female = 1×7
   99.1667  100.0000   74.1667    8.6120  110.00
```

d. Estimate the correlation between the salaries and the years of education after high school. Name the correlation corr_sal_years. Also estimate the p-values of the correlations. Name it as p_corr_sal_years.

```
[corr_sal_years,p_corr_sal_years]=corrcoef(A(:,3
```

```
corr_sal_years = 2×2
    1.0000    0.8911
    0.8911    1.0000
p_corr_sal_years = 2×2
    1.0000    0.0005
    0.0005    1.0000
```

e. Do the same as before, but this time for males and females independently. Create a matrix with two columns: first column the years and second column the salaries for male and females. Name the matrices sal_year_m and sal_year_f. After this, estimate the correlations and p-values. Name the correlation matrices as corr_sal_years_m and corr_sal_years_f; the p-values should be named as p_corr_sal_years_m and p_corr_sal_years_f.

```
sal_year_m=[];
sal_year_f=[];
for i =1:size(A,1)
    if A(i,2)==0
        sal_year_m=[sal_year_m;A(i,[4,3])]
    end
end
```

```
sal_year_m = 1×2
     4   125
sal_year_m = 2×2
```

```
     4   125
     7   140
sal_year_m = 3×2
     4   125
     7   140
     4   110
sal_year_m = 4×2
     4   125
     7   140
     4   110
     6   125
```

```
for j =1:size(A,1)
    if A(j,2)==1
        sal_year_f=[sal_year_f;A(j,[4,3])]
    end
end
```

```
sal_year_f = 1×2
     4   100
sal_year_f = 2×2
     4   100
     2    95
sal_year_f = 3×2
     4   100
     2    95
     2    85
sal_year_f = 4×2
```

```
     4   100
     2    95
     2    85
     4   110
sal_year_f = 5×2
     4   100
     2    95
     2    85
     4   110
     4   100
sal_year_f = 6×2
     4   100
     2    95
     2    85
     4   110
     4   100
     4   105
```

```
[corr_sal_years_m,p_corr_sal_years_m]=corrcoef(s
```

```
corr_sal_years_m = 2×2
    1.0000    0.8165
    0.8165    1.0000
p_corr_sal_years_m = 2×2
    1.0000    0.1835
    0.1835    1.0000
```

```
[corr_sal_years_f,p_corr_sal_years_f]=corrcoef(s
```

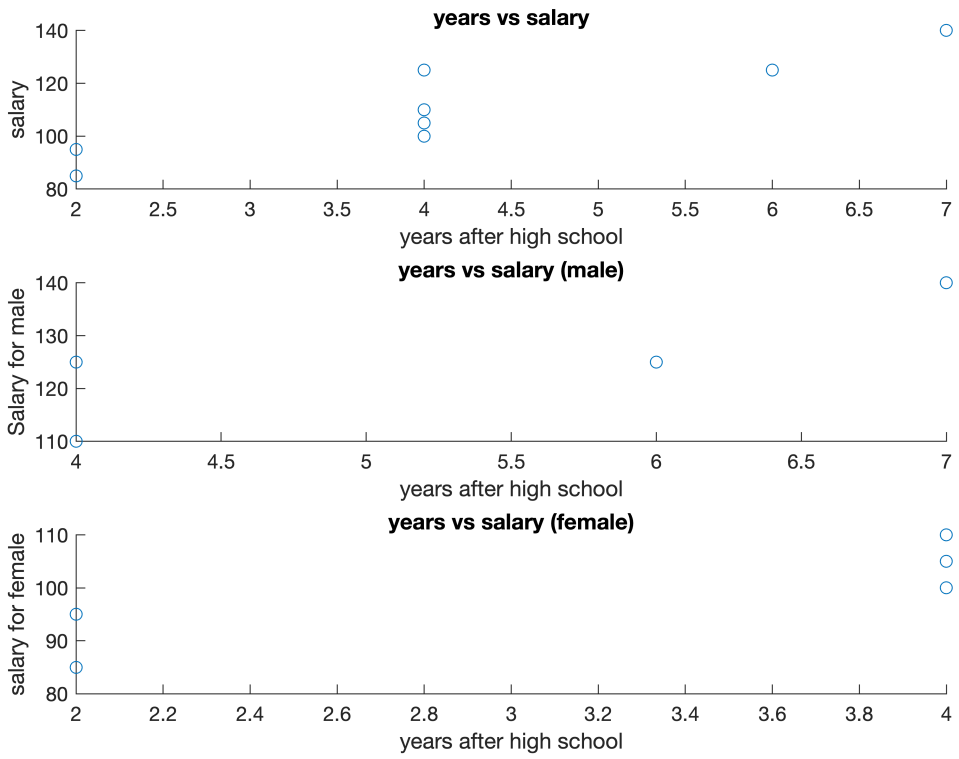
```
corr_sal_years_f = 2×2
```

```
    1.0000    0.8245
    0.8245    1.0000
p_corr_sal_years_f = 2×2
    1.0000    0.0435
    0.0435    1.0000
```

```
subplot(3,1,1)
scatter(A(:,4),A(:,3))
title("years vs salary")
xlabel("years after high school")
ylabel("salary")

subplot(3,1,2)
scatter(sal_year_m(:,1),sal_year_m(:,2))
title("years vs salary (male)")
xlabel("years after high school")
ylabel("Salary for male")

subplot(3,1,3)
scatter(sal_year_f(:,1),sal_year_f(:,2))
title("years vs salary (female)")
xlabel("years after high school")
ylabel("salary for female")
```



Question 2, see last homework file.