HW2\_Group #1\_Austin Halvorsen

Pedram Jahangiry

Sep 15 2020

# Problems

## Question 1

### (i)

[1] 1 5 9 13 17

## Question 2

### (i)

[,1] [,2] [,3] [,4] [,5]  
[1,] 20 21 22 23 24  
[2,] 25 26 27 28 29  
[3,] 30 31 32 33 34  
[4,] 35 36 37 38 39

### (ii)

A B C D E  
[1,] 20 21 22 23 24  
[2,] 25 26 27 28 29  
[3,] 30 31 32 33 34  
[4,] 35 36 37 38 39

### (iii)

B D  
[1,] 26 28  
[2,] 36 38

### (iv)

[,1] [,2]  
B 26 36  
D 28 38

### (v)

[,1] [,2]  
B -1.9 1.4  
D 1.8 -1.3

### (vi)

[,1] [,2]  
[1,] 1 0  
[2,] 0 1

## Question 3

### (i)

mpg cyl disp hp drat wt qsec vs am gear carb  
Mazda RX4 21.0 6 160.0 110 3.90 2.620 16.46 0 1 4 4  
Mazda RX4 Wag 21.0 6 160.0 110 3.90 2.875 17.02 0 1 4 4  
Datsun 710 22.8 4 108.0 93 3.85 2.320 18.61 1 1 4 1  
Hornet 4 Drive 21.4 6 258.0 110 3.08 3.215 19.44 1 0 3 1  
Hornet Sportabout 18.7 8 360.0 175 3.15 3.440 17.02 0 0 3 2  
Valiant 18.1 6 225.0 105 2.76 3.460 20.22 1 0 3 1  
Duster 360 14.3 8 360.0 245 3.21 3.570 15.84 0 0 3 4  
Merc 240D 24.4 4 146.7 62 3.69 3.190 20.00 1 0 4 2  
Merc 230 22.8 4 140.8 95 3.92 3.150 22.90 1 0 4 2  
Merc 280 19.2 6 167.6 123 3.92 3.440 18.30 1 0 4 4

### (ii)

cyl hp wt vs am gear mpg  
Datsun 710 4 93 2.320 1 1 4 22.8  
Merc 240D 4 62 3.190 1 0 4 24.4  
Merc 230 4 95 3.150 1 0 4 22.8  
Fiat 128 4 66 2.200 1 1 4 32.4  
Honda Civic 4 52 1.615 1 1 4 30.4

### (iii)

cyl hp wt vs am gear mpg gpm  
1 4 93 2.320 1 1 4 22.8 0.044  
2 4 62 3.190 1 0 4 24.4 0.041  
3 4 95 3.150 1 0 4 22.8 0.044  
4 4 66 2.200 1 1 4 32.4 0.031  
5 4 52 1.615 1 1 4 30.4 0.033

### (iv)

'data.frame': 32 obs. of 8 variables:  
 $ cyl : num 4 4 4 4 4 4 4 4 4 4 ...  
 $ hp : num 93 62 95 66 52 65 97 66 91 113 ...  
 $ wt : num 2.32 3.19 3.15 2.2 1.61 ...  
 $ vs : num 1 1 1 1 1 1 1 1 0 1 ...  
 $ am : num 1 0 0 1 1 1 0 1 1 1 ...  
 $ gear: num 4 4 4 4 4 4 3 4 5 5 ...  
 $ mpg : num 22.8 24.4 22.8 32.4 30.4 33.9 21.5 27.3 26 30.4 ...  
 $ gpm : num 0.044 0.041 0.044 0.031 0.033 0.029 0.047 0.037 0.038 0.033 ...

### (v)

'data.frame': 32 obs. of 8 variables:  
 $ cyl : Factor w/ 3 levels "4","6","8": 1 1 1 1 1 1 1 1 1 1 ...  
 $ hp : num 93 62 95 66 52 65 97 66 91 113 ...  
 $ wt : num 2.32 3.19 3.15 2.2 1.61 ...  
 $ vs : Factor w/ 2 levels "0","1": 2 2 2 2 2 2 2 2 1 2 ...  
 $ am : Factor w/ 2 levels "0","1": 2 1 1 2 2 2 1 2 2 2 ...  
 $ gear: Factor w/ 3 levels "3","4","5": 2 2 2 2 2 2 1 2 3 3 ...  
 $ mpg : num 22.8 24.4 22.8 32.4 30.4 33.9 21.5 27.3 26 30.4 ...  
 $ gpm : num 0.044 0.041 0.044 0.031 0.033 0.029 0.047 0.037 0.038 0.033 ...

# Computer Exercises

## Alcohol Dataset for Questions

### (i)

**What is percentage of the men in the sample report abusing alcohol?**

0 1   
0.90083486 0.09916514

From the sample, we see about 9.9% of men report alcohol abuse

### (ii)

**What is the employment rate?**

2 3   
0.03272888 0.96727112

2 3   
 148 4374

The employment rate is ≈ 96.7%

### (iii)

**Consider the group of men who abuse alcohol. What is the employment rate?**

2 3   
0.04601571 0.95398429

The employment rate of those who abuse alcohol is ≈ 95.4%

### (iv)

**What is the employment rate for the group of men who do not abuse alcohol?**

2 3   
0.03334546 0.96665454

The employment rate for those who do not abuse alcohol is ≈ 96.7%

### (v)

**Discuss the difference in your answers to parts (iii) and (iv). Does this allow you to conclude that alcohol abuse causes unemployment?**

The rates of those who abuse alcohol and those who do not were who were employed were x% and y%. This does not highlight anything to do with the causality of alcohol abuse and unemployment. We would need to test and control other explanatory variables to try to explain the reasoning for unemployement.