Omar Saeed Ali Negm

omarnegm2014@gmail.com

01092446124

Analysis Tasks

Mean Salary Calculation:

Mean = $\frac{\sum_i^n x_i}{n}$, n= number of data points, i= datapoint index

∴ *Mean* = $\frac{60+75+65+50+80+45+95+85+70+55+78+82+90+40+95}{15} = \frac{(110+140+150+100+160+130+190+85)}{15} = \frac{290+210+290+187+85}{15} = \frac{272+580+210}{15} = \frac{580+482}{15} = \frac{1062}{14} = 70 + \frac{12}{15} = \mathbf{70.8}$

Median Age Calculation:

1. Sort the datapoints:
   - [22, 24, 25, 26, 28, 29, 30, 32, 33, 35, 36, 38, 39, 40, 41]
2. N= 15, so the middle index = 7th

∴ *Median* = **32**

IQR for Projects Completed:

From step 1 at getting the median: [3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17]

IQR = min(3rd quarter) – max(1st quarter)

min(3rd quarter) = 13th value = 15 , max(1st quarter) = 3rd value= 5

➔ ∴ *IQR* = 15 – 5 = **10**

Variance for Hours worked per week:

Variance = SS/(n-1) , SS: sum-of-squares = $\sum_i^n (x_i - \mu)$, $n = 15$,

$\mu = mean(Hrs\ p\ week)$

$$= \frac{(40+40)+(50+50)+38+39+(42+42+42)+43+44+45+48+(41+41)}{15}$$

$$= \frac{(100+126)+(80+82)+(77\ +44+88+48)}{15}$$

$$= \frac{226+162+(77*2+11+92)}{15} = \frac{226+162+165+92}{15} = \frac{327+318}{15} = \frac{645}{15}$$

$$= 43$$

SS =

$(40-43)^2 + (40-43)^2 +$

$(42-43)^2 + (42-43)^2 + (42-43)^2 +$

$(38-43)^2 +$

$(45-43)^2 +$

$(50-43)^2 + (50-43)^2 +$

$(44-43)^2 +$

$(39-43)^2 +$

$(48-43)^2 +$

$(41-43)^2 + (41-43)^2 +$

$(43-43)^2 = 9+1+25+4+9+49+1+16+1+25+4+0+4+49+1$

$= 198$

➔ ∴ *Variance* = 198/14 = 14+(2/14)

Std Deviation for Hrs/week :

From the variance given:

$$\therefore \sigma = \sqrt{variance} = \sqrt{\mathbf{14.142857}} = \mathbf{3.761}$$

Z-Score for Performance Rating(for the one of 7-valued):

z-score = $\frac{x-\mu}{\sigma}$, $x = 7$

$$\mu = \frac{(8*3)+(9*4)+(7*2)+(6*2)+(5+4)+(2*10)}{15}$$

$$= \frac{24+36+9+20+12+14}{15} = \frac{26+60+29}{15} = \frac{60+55}{15} = \frac{115}{15}$$

$$= 7 + \frac{2}{3} = 7.667$$

SS = $(8-7.667)^2 * 3 +$

$(9-7.667)^2 * 4 +$

$(7-7.667)^2 * 2 +$

$(6-7.667)^2 * 2 +$

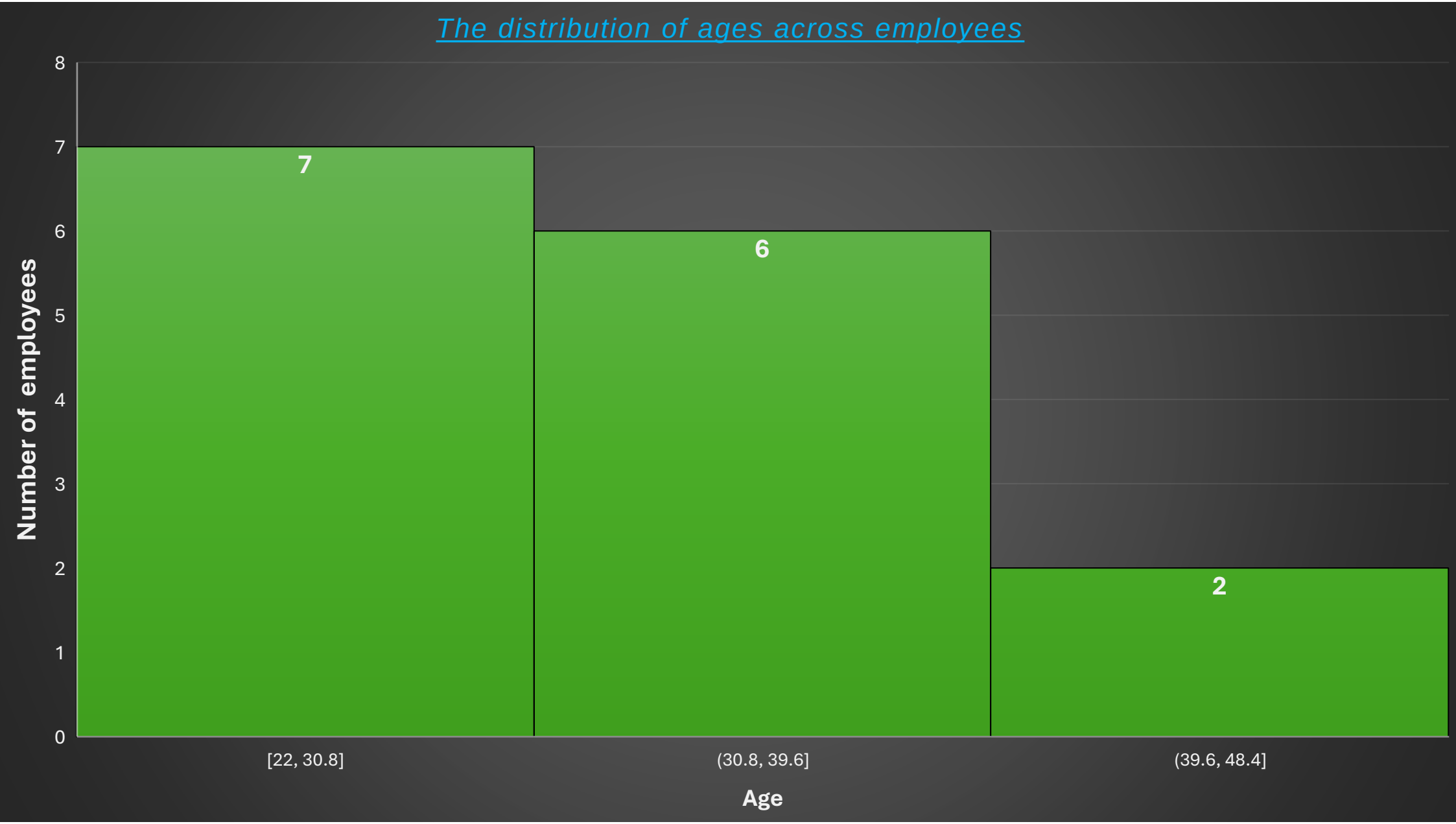
$(5-7.667)^2 + (4-7.667)^2 +$

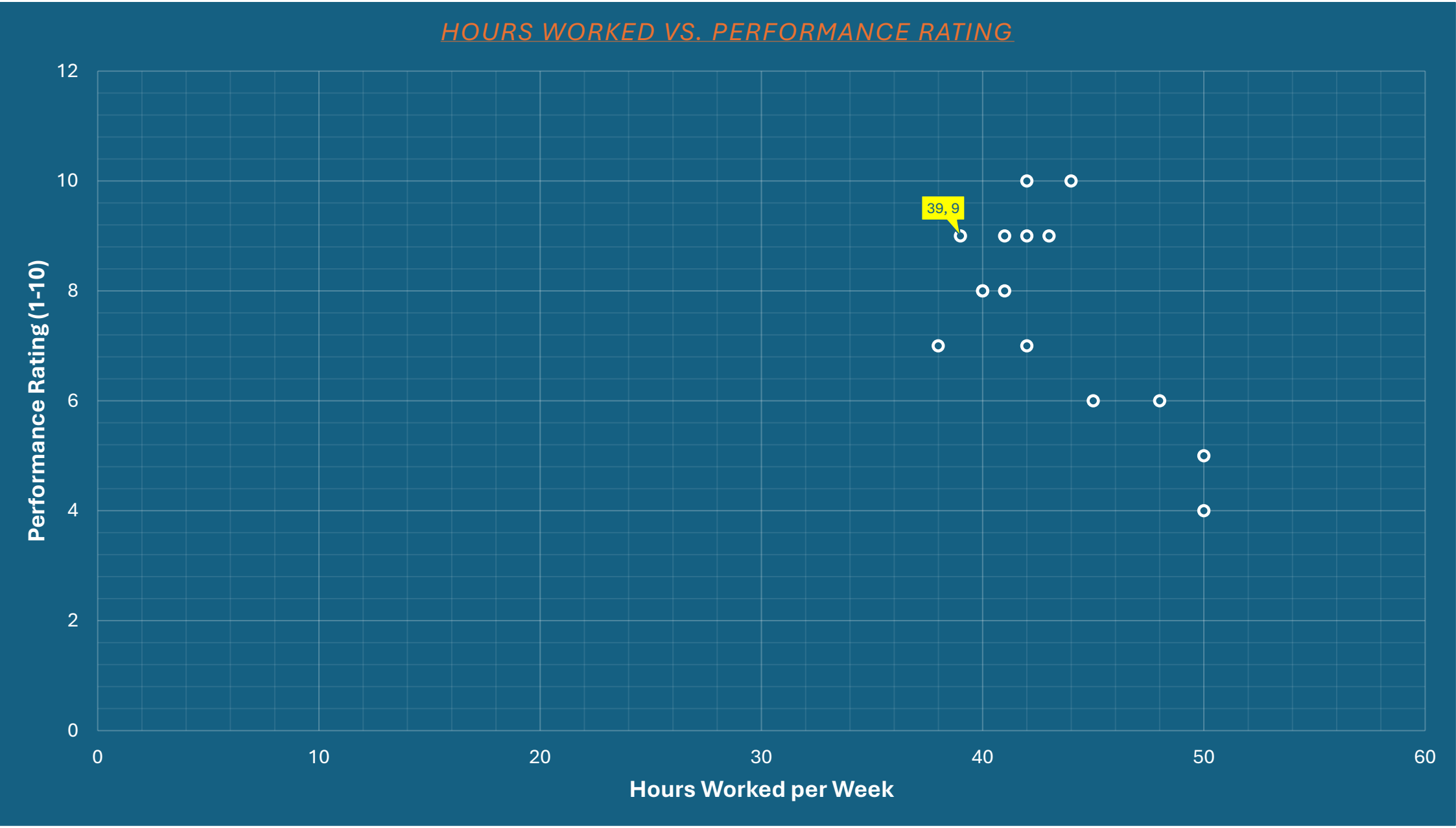
$(10-7.667)^2 * 2 = 45.333$

$\sigma = \sqrt{45.333/14} = 1.799464$

➔ ∴ Z-score = $\frac{7-7.667}{1.799464} = \mathbf{-0.3706659}$

Visualization Tasks:


The distribution of ages across employees
Number of employees
8
7
6
5
4
3
2
1
0
7
6
2
[22, 30.8]
(30.8, 39.6]
(39.6, 48.4]
Age


HOURS WORKED VS. PERFORMANCE RATING
Performance Rating (1-10)
Hours Worked per Week
39, 9
0
2
4
6
8
10
12
0
10
20
30
40
50
60