STAT 4355 HW2

Code

a)

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```
#import data
sysbp=read.csv("hw2_systolic_bp.csv")
y=sysbp$sys.bp
x=sysbp$ï..weight
#fit model
lmsb=lm(y~x)
summary(lmsb)
```

```

Call:
lm(formula = y ~ x)

Residuals:
    Min      1Q  Median      3Q     Max
-17.182  -6.485  -2.519   8.926  12.143

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 69.10437   12.91013   5.353 1.71e-05 ***
x            0.41942    0.07015   5.979 3.59e-06 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 8.681 on 24 degrees of freedom
Multiple R-squared:  0.5983,    Adjusted R-squared:  0.5815
F-statistic: 35.74 on 1 and 24 DF,  p-value: 3.591e-06
```

b)

y-hat = 69.10437 + 0.41942x

c)

An intercept of 69.10437 means the value of systolic pressure is 69.10437 when the weight is zero and a slope of 0.41942 means for a unit change in the weight, systolic pressure increases by 0.4194 on average.

d)

Null hypothesis: H0: β1=0
Alt. hypothesis: H1: β1/=0

t value of 5.979 and p value of 3.59e-06 < 0.05 => reject H0 so weight is statistically significant at 5% significance level

e)

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```
lmsb2 <- lm(y~x+offset(-50*x))
summary(lmsb2)
```

```
Call:
lm(formula = y ~ x + offset(-50 * x))

Residuals:
    Min      1Q  Median      3Q     Max
-17.182  -6.485  -2.519   8.926  12.143

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 69.10437   12.91013   5.353 1.71e-05 ***
x           50.41942    0.07015 718.714  < 2e-16 ***
---
Signif. codes:
0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 8.681 on 24 degrees of freedom
Multiple R-squared:  0.5983,    Adjusted R-squared:  0.5815
F-statistic: 35.74 on 1 and 24 DF,  p-value: 3.591e-06
```

Null hypothesis: H0: β1=-50
Alt. hypothesis: H1: β1/=-50

t value of 718.714 and p value of 2e-16 < 0.05 => reject H0 at 5% significance level so slope is not equal to -50.