Let,

X=The length of stem

Y=The area of leaf

1. **Ans: Pvalue=0.00165**
2. **The upper bound of 95% confidence interval for the slope coefficient is**

**1.691325**

**c) The lower bound on the 95% prediction interval for the are of a leaf with a length of 41**

**is 47.54412**

**R code and Output:**

**R-Code:**

**x=c(36,33,26,32,27,22,30,25,26,27)**

**y=c(50,48,46,52,40,36,45,38,37,44)**

**model=lm(y~x);model**

**summary(model)**

**confint(model,'x',level=0.95)**

**new.l=data.frame(x=41)**

**predict(model,newdata=new.l)**

**predict(model,newdata=new.l,interval="prediction")**

> x=c(36,33,26,32,27,22,30,25,26,27)

> y=c(50,48,46,52,40,36,45,38,37,44)

> model=lm(y~x);model

Call:

lm(formula = y ~ x)

Coefficients:

(Intercept) x

11.493 1.131

> summary(model)

Call:

lm(formula = y ~ x)

Residuals:

Min 1Q Median 3Q Max

-3.8867 -1.9520 -0.6047 1.3959 5.1133

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 11.4926 6.9756 1.648 0.13806

x 1.1305 0.2432 4.649 0.00165 \*\*

Residual standard error: 3.099 on 8 degrees of freedom

Multiple R-squared: 0.7298, Adjusted R-squared: 0.6961

F-statistic: 21.61 on 1 and 8 DF, p-value: 0.001647

> anova(model)

Analysis of Variance Table

Response: y

Df Sum Sq Mean Sq F value Pr(>F)

x 1 207.567 207.567 21.613 0.001647 \*\*

Residuals 8 76.833 9.604

> confint(model,'x',level=0.95)

2.5 % 97.5 %

x 0.5697592 1.691325

> new.l=data.frame(x=41)

> predict(model,newdata=new.l)

1

57.84483

> predict(model,newdata=new.l,interval="prediction")

fit lwr upr

1 57.84483 47.54412 68.14554