**Name: Sulav Adhikari**

# Roll no: 23081003

# Statistics Lab No.5

# Q9)

# Working Expression:

The regression line of Y on X1 and X2 is Y = a + b1x1 + b2x2

Where, Y= dependent variable A = y-intercept

B1 and b2 are regression coefficients X1 and x2 are independent variable

# Working Procedure:

# Define variables Rent, Room, Distance in variable view → Assign type as Numeric → Label

# them as Rent (Constant), Room, Distance from downtown → Assign measure as Scale →

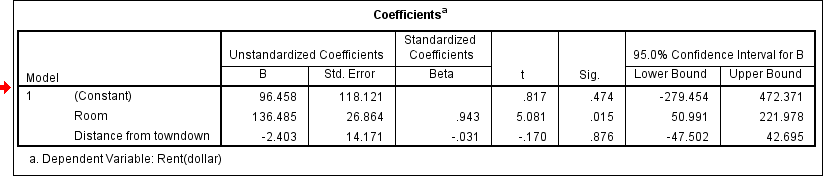
# Put data in data view → Analyze → Regression → Linear → Put rent in dependent list → Put

# room and distance in independent → Go to statistics → Level of confidence interval 95% →

# continue → ok

# SPSS OUTPUT:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Summary** | | | | |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .957a | .916 | .859 | 97.086 |
| a. Predictors: (Constant), Distance from downtown, Number of rooms | | | | |



**Calculation:**

Here, a = 96.45

b1 = 136.185

b2 = -2.403

The multiple models are

Y = a + b1x1 + b2x2

= 96.45 + 136.185x1 – 2.4x2

b) When x1 =2, x2 = 2, Y =?

Y = 96.45 + 136.18\*1 – 2.4\*2

= 96.45 + 136.18\*2 – 2.4\*2

= 364.01

c)Multiple determination (R) = 0.196

= 91. 6%

Which means that 91.6% of variation of dependent variable rent is explained by two independent rooms and distance

c-ii) Standard error of estimation is 97.08.

**Conclusion:**

In general, in this way we can obtain the estimated value of rent, coefficient of determination and standard error from the given data.

# Name: Sulav Adhikari

# Roll no: 23081003

# Statistics Lab No.5

# Q10)

# Working Expression:

The regression line of Y on X1 and X2 is Y = a + b1x1 + b2x2

Where, Y= dependent variable A = y-intercept

B1 and b2 are regression coefficients X1 and x2 are independent variable

# Working Procedure:

# Define variables Expenditure, Income and Family Members in variable view → Assign type as Numeric → Label them as Expenditure of food (in thousand rupees) Y, Income (in thousand rupees) X1 and Family members (size in number) X2→ Assign measure as Scale →Put data in data view → Analyze → Regression → Linear → Put rent in dependent list → Put room and distance in independent → Go to statistics → Level of confidence interval 95% → continue → ok

# SPSS OUTPUT:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Summary** | | | | |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .733a | .537 | .228 | .962 |
| a. Predictors: (Constant), Family Members, IncomeX1 | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Coefficients a** | | | | | | | | |
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | |
| B | Std. Error | Beta | Lower Bound | Upper Bound |
| 1 | (Constant) | -2.739 | 3.102 |  | -.883 | .442 | -12.611 | 7.134 |
| IncomeX1 | .405 | .230 | .692 | 1.761 | .176 | -.327 | 1.138 |
| Family Members | .192 | .284 | .265 | .675 | .548 | -.712 | 1.095 |
| a. Dependent Variable: Expenditure on FOOD | | | | | | | | |

**Calculation:**

Here, a = -2.739

b1 = 0.405

b2 = 0.192

The multiple models are

Y = a + b1x1 + b2x2

= -2.739 + 0.405x1+0.192x2

b) When x1 =20, x2 = 5, Y =?

Y = -2.739 +0.405\*20+0.192\*5

= 6.321

c)Multiple determination (R) = 0.537

= 53.7%

Which means that 53.7% of variation of dependent variable food is explained by two independent income and family members.

c-ii) Standard error of estimation is 96.2

**Conclusion:**

In general, in this way we can obtain the estimated value of food, coefficient of determination and standard error from the given data.

# Name: Sulav Adhikari

# Roll no: 23081003

# Statistics Lab No. 5

# Q11)

# Working Expression:

The regression line of Y on X1 and X2 is Y = a + b1x1 + b2x2

Where, Y= dependent variable A = y-intercept

B1 and b2 are regression coefficients X1 and x2 are independent variable

# Working Procedure:

Define variables Y, X1, X2 in variable view -> Put data in variable view ->Put measure as scale-> Analyze -> Regression -> Linear -> Put Y in dependent list -> Put X1 and X2 in independent list -> Goto statistics -> Level of confidence interval 95% -> continue -> ok

# SPSS OUTPUT:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Summary** | | | | |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .907a | .823 | .705 | 1.016 |
| a. Predictors: (Constant), X2, X1 | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Coefficients a** | | | | | | | | |
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | |
| B | Std. Error | Beta | Lower Bound | Upper Bound |
| 1 | (Constant) | -7.862 | 4.169 |  | -1.886 | .156 | -21.130 | 5.406 |
| X1 | -.049 | .058 | -.257 | -.839 | .463 | -.233 | .136 |
| X2 | .278 | .082 | 1.041 | 3.396 | .043 | .017 | .538 |
| a. Dependent Variable: Y | | | | | | | | |

# Calculation:

Here, a = -7.862

b1 = -0.049

b2 = 0.278

The multiple models are

Y = a + b1x1 + b2x2

= -7.862 -0.049x1+0.278x2

b) When x1 =50, x2 = 100, Y =?

Y = -7.862 -0.049\*50+0.278\*100

= 17.488

c) Multiple determination (R) = 0.823

= 82.3%

Which means that 82.3% of variation of dependent variable Y is explained by two independent variables X1 and X2.

c-ii) Standard error of estimation is 1.016

# Conclusion:

In general, in this way we can obtain the estimated value, coefficient of determination and

standard error from the given data.