1. A random sample of download speed of network points of Subisu ISP give the following data in mbps: 70,120, 110, 101, 88, 83, 95, 107, 100,101, 105, 106, 107, 85, 96, 98, 89, 92,94, 99, 88, 86 and 98. Do these data support the average download speed is 100 mbps?

Working Expression:

$$t=\frac{\text{Sample mean}-\text{Population mean}}{\textit{Standard error}}$$

Working Procedure:

Define variables downloadspeed variables view → Type, numeric → Label, Download Speed → measure, scale → input data in data view →Analysis → compare means → one sample t-test →put in test variables →options, 95% → continue → test value=100 → ok

SPSS OUTPUT:

One-Sample Test

	Test Value = 100					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
DownloadSpeed	-2.149	97	.034	-3.276	-6.30	-.25

Setting of Hypothesis:

H0: The Population mean is equal to 100 Mbps.

H1: The Population mean is not equal to 100 Mbps. (Two tailed test)

Level of significance

$\alpha = 0.05$

Decision:

Here p-value (two tailed) (2p) = 0.034

Since $p=0.034<\alpha=0.05$, we reject H0 and H1 is accepted.

Conclusion:

Hence, we conclude that the Population mean is not equal to 100 Mbps.

2. The table shows the corresponding values of three variables Y and and

Y	7	6	8	10	9	5	3	4
	39	52	49	46	61	35	25	55
	8	6	7	12	9	6	7	4

i. Fit the linear regression model of Y on and.

ii. Estimate Y when = 48 and = 9.

iii. Compute the multiple determination, adjusted and standard error of the estimate.

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 in variable view -> Put data in variable view -> Analyze -> Regression -> Linear -> Put rent in dependent list -> Put room and distance in independent -> 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	.957[a]	.916	.859	97.086

a. Predictors: (Constant), Distance from downtown, Number of rooms

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)	96.458	118.121		.817	.474	-279.454	472.371
	Room	136.485	26.864	.943	5.081	.015	50.991	221.978
	Distance from towndown	-2.403	14.171	-.031	-.170	.876	-47.502	42.695

a. Dependent Variable: Rent(dollar)

Calculation:

Here, a = 96.45

b1 = 136.185

b2 = -2.403

The multiple model is

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.

29-03-19

3. A study was conducted about RAM produced by company A and B. The following data reveal the RAM produced by company A and B. Is there any significant difference in the durability of RAM produced by company A and B?

Company A	10	12	13	11	14		
Company B	8	9	12	14	15	10	9

Q8)

Working Expression:

$$t = \frac{\text{mean of first sample} - \text{mean of second sample}}{\text{standard error}}$$

Working Procedure:

Define variables company A, company B and value in variable view →label them as company and value→ assign type as numeric for company A and company B →assign measure as scale→ go to analyze → compare means → independent sample t –test → put values of company in test variables and values in grouping variable → go to options give level of confidence 95% → continue → ok

SPSS OUTPUT:

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
values of company	Equal variances assumed	3.361	.097	.735	10	.479	1.000	1.361	-2.032	4.032
	Equal variances not assumed			.804	9.759	.441	1.000	1.244	-1.781	3.781

Setting of Hypothesis:

Ho: There is no significant difference between the durability of RAM.

H1: There is significant difference between the durability of RAM. (two tailed test).

Level of significance

$\alpha = 0.05$

Decision:

For Levene's test for equality of variances,

p- value = 0.097> α = 0.05, we accept Ho

Hence, equal variances assumed.

Since 2p = 0.479 > α = 0.05, we accept Ho.

Conclusion:

Hence, we conclude that there is no significant difference between the durability of RAM.

2024-2-28