Sri Lanka Institute of Information Technology

Year 02 – Semester II – 2023

Probability and Statistics – IT2110

Tutorial 08

1) In an experiment to study the dependence of hypertension on smoking habits, the following data were taken on 180 individuals.

	Non-smokers	Moderate smokers	Heavy smokers
Hypertension	21	36	30
No hypertension	48	26	19

Test the hypothesis that the presence or absence of hypertension is independent of smoking habits. Use 0.05 level of significance.

2) A random sample of 200 married men, all retired, was classified to education and number of children.

Education	No of children		
	0-1	2-3	Over 3
Elementary	14	37	32
Secondary	19	42	17
College	12	17	10

Test the hypothesis at the 5% level of significance, that the size of a family is independent of the level of education attained by the father.

3) A researcher has collected data on whether students are satisfied with workshop for statistics. He wants to study whether gender and satisfaction for workshop are independent or not. The data was collected from 200 individuals.

	1 (Highly Satisfied)	2 (Satisfied)	3 (No idea)	4 (Dissatisfied)	5 (Highly dissatisfied)
Male	2	2	15	25	55
Female	5	6	15	31	44

Test the researcher's interest at 5% level of significance.

4) Four seeds were planted in each of one hundred pots under identical conditions, as part of an experimental investigation into seed germination. After a fixed period of time the number of seeds germinating in each pot was noted and the frequency table was as follows.

No of seeds germinating	0	1	2	3	4
Number of pots	12	24	39	22	3

If seeds germinate independently under these conditions, then the number germinating should follow a binomial distribution. Test this hypothesis using a goodness of fit statistic. Use an alternative statistic and comment of the results of both your tests.

5) A researcher designs an experiment in which a rat is attracted to the end of a ramp that divides, leading to doors of three different colors. The researcher sends the rat down the ramp n = 90 times and observes the choices in below table. Does the rat have (or acquire) a preference for one of the three doors?

	Door		
	Green	**Red**	**Blue**
Observed Count	20	39	31