QUIZ 1 Komputasi Statistika
1 Oktober 2023
Waktu: 120 menit

Kerjakan semua soal dibawah ini dengan software R, dan lakukan penghapusan memori dengan perintah **rm(list=ls())** sebelum mulai mengerjakan soal,

1. Buat program R untuk menyelesaikan kasus berikut ini

Problem: We have surveyed 50 males and 100 females and asked them whether they personally wanted to have kids. The choices available to each person were "yes," "no," and "undecided." Listed here are the results of the survey.

	Want Kids	Don't Want Kids	Undecided	Row Totals
Males	20	10	20	50
Females	20	20	60	100
Column Totals	40	30	80	150

The first step is to compute the expected cell frequencies for each of the six cells. For each cell, the expected cell frequency is equal to the row total multiplied by the column total and divided by the grand total (the sum of all cells).

Below are the observed data with the expected cell frequencies in parentheses. Note that the expected cell frequencies, when added down the columns or across the rows, must give the same row and column totals of the original data. If they do not, we must have made a mistake in the computations.

	Want Kids	Don't Want Kids	Undecided	Row Totals
Males	20 (13.33)	10 (10.00)	20 (26.67)	50
Females	20 (26.67)	20 (20.00)	60 (53.33)	100
Column Totals	40	30	80	150

Compute the value of chi square: Use the following formula to compute the value of chi square.

$$\chi^2 = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i}$$

$$\chi^2 = \frac{(20-13.33)^2}{13.33} + \frac{(10-10)^2}{10} + \frac{(20-26.67)^2}{26.27} + \frac{(20-26.67)^2}{26.67} + \frac{(20-20)^2}{20} + \frac{(60-53.33)^2}{53.33}$$

$$\chi^2 = 3.34 + 0.00 + 1.67 + 1.67 + 0.00 + 0.83 = 7.51$$

Compare the computed value of chi-square with the appropriate critical value. Because df = (# of categories - 1)(# of groups - 1) = (3 - 1)(2 - 1) = 2, the critical value of chi square is 5.991 (alpha= 0.05).

2. Diberikan data sebagai berikut:

Usia	Body mass index (BMI)	Jml Anak	Biaya Asuransi
19	27.9	0	16.884
18	33.77	1	17.25
28	33	3	44.49
33	22.705	0	21.984
32	28.88	0	38.66
31	25.74	0	37.56
46	33.44	1	82.41
37	27.74	3	72.81
37	29.83	2	64.06

   a. Simpan data ini dalam file excel, lalu baca file excel tersebut di R.
   b. Buat matriks A yaitu matriks yang berisi data "Usia" dan "Jml Anak" dan matriks B yang berisi data "BMI" dan "Biaya Asuransi". Hitung $C=\left(AB^{'}\right)^{-1}$

3. Buat program untuk menghitung:
   a. $\sum_{i=1}^{n}\binom{n}{i}x_i$
   b. $\left(\sum_{i=1}^{5}(x_i+2)\right)^{i}$

   Dimana x_i adalah jumlah anak dan $\binom{m}{k}=\frac{m!}{k!(m-k)!}$

   Note: Gunakan pernyataan *looping* untuk menghitung pangkat dan faktorial

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