Uji HOMOGENITAS
KHI KUADRAT

r SAMPEL INDEPENDEN

Bentuk tabel kategorik

General Model for an $r \times c$ Contingency Table

		Column variable						Row sums
		C_1	C_2	...	C_j	...	C_c	
Row variable	R_1	O_{11}	O_{12}	...	O_{1j}	...	O_{1c}	$O_{1.}$
	R_2	O_{21}	O_{22}	...	O_{2j}	...	O_{2c}	$O_{2.}$
	⋮	⋮	⋮		⋮		⋮	⋮
	R_i	O_{i1}	O_{i2}	...	O_{ij}	...	O_{ic}	$O_{i.}$
	⋮	⋮	⋮		⋮		⋮	⋮
	R_r	O_{r1}	O_{r2}	...	O_{rj}	...	O_{rc}	$O_{r.}$
Column sums		$O_{.1}$	$O_{.2}$	...	$O_{.j}$	...	$O_{.c}$	n

$c \geq 2$

$r \geq 2$

- The chi-square test for homogeneity is employed when r independent samples (where $r \geq 2$) are categorized on a single dimension which consists of c categories (where $c \geq 2$)

- It is assumed that each of the samples is randomly drawn from the underlying population it represents

- The chi-square test for homogeneity evaluates whether or not the r samples are homogeneous with respect to the proportion of observations in each of the c categories

assumptions

a) Categorical/ nominal data (i.e., frequencies) for r x c mutually exclusive categories are employed in the analysis;

b) The data that are evaluated represent a random sample comprised of n independent observations

c) The expected frequency of each cell in the contingency table is 5 or greater

contoh

Seorang peneliti melakukan penelitian untuk mengetahui pengaruh suara atau kebisingan dalam kebiasan belajar. Sebanyak 200 orang secara random dikenakan pada kondisi eksperimen. Data seperti berikut:

	Helped the confederate	Did not help the confederate		Row sums
Noise	30	70		100
No noise	60	40		100
Column sums	90	110	Total observations	200

Lakukan uji homogenitas dengan tingkat signifikansi 5%

penyelesaian

i. $H_0 : o_{ij} = \varepsilon_{ij}$ (frekuensi teramati untuk setiap sel rxc sama dengan frekuensi harapan)

$H_1 : o_{ij} \neq \varepsilon_{ij}$ (frekuensi teramati untuk setiap sel rxc tidak sama dengan frekuensi harapan)

ii. Hitung Khi Kuadrat

Chi-Square Summary Table

Cell	O_{ij}	E_{ij}	$(O_{ij} - E_{ij})$	$(O_{ij} - E_{ij})^2$	$\frac{(O_{ij} - E_{ij})^2}{E_{ij}}$
$Cell_{11}$ — Noise/Helped the confederate	30	45	–15	225	5.00
$Cell_{12}$ — Noise/Did not help the confederate	70	55	15	225	4.09
$Cell_{21}$ — No noise/Helped the confederate	60	45	15	225	5.00
$Cell_{22}$ — No noise/Did not help the confederate	40	55	–15	225	4.09
	$\Sigma O_{ij} = 200$	$\Sigma E_{ij} = 200$	$\Sigma(O_{ij} - E_{ij}) = 0$		$\chi^2 = 18.18$

iii. Analisis

$$\chi^2_{\text{tabel}} = \chi^2_{(r-1)(c-1);\alpha} = \chi^2_{1;0,05} = 3,84$$

Karena $\chi^2 = 18,18 > \chi^2_{\text{tabel}} = 3,84$ maka H0 ditolak. Atau dengan kata lain paling tidak salah satu diantara keempat populasi tidak homogen.

Additional Analytical …

- the chi-square test for r x c tables employs a continuous distribution to approximate a discrete probability distribution.

$$\chi^2 = \sum_{i=1}^{r}\sum_{j=1}^{c}\left[\frac{\left(\left|O_{ij} - E_{ij}\right| - 0.5\right)^2}{E_{ij}}\right]$$

Koreksi Yate's untuk Uji Khi Kuadrat

Cell	O_{ij}	E_{ij}	$(\lvert O_{ij} - E_{ij}\rvert - .5)$	$(\lvert O_{ij} - E_{ij}\rvert - .5)^2$	$\frac{(\lvert O_{ij} - E_{ij}\rvert - .5)^2}{E_{ij}}$
$Cell_{11}$ — Noise/ Helped the confederate	30	45	14.5	210.25	4.67
$Cell_{12}$ — Noise/ Did not help the confederate	70	55	14.5	210.25	3.82
$Cell_{21}$ — No noise/ Helped the confederate	60	45	14.5	210.25	4.67
$Cell_{22}$ — No noise/ Did not help the confederate	40	55	14.5	210.25	3.82
	$\Sigma O_{ij} = 200$	$\Sigma E_{ij} = 200$			$\chi^2 = 16.98$

Karena $\chi^2 = 16{,}98 > \chi^2_{\text{tabel}} = 3{,}84$ maka H0 ditolak. Atau dengan kata lain paling tidak salah satu diantara keempat populasi tidak homogen.