1. Diketahui: $μ=40$; $σ=6,3$

Ditanyakan: $P\left(37\leq \overbar{X}\leq 49\right)$

Jawab:

$$P\left(37\leq \overbar{X}\leq 49\right)=P\left(\frac{37-40}{^{6,3}/\_{\sqrt{1}}}\leq Z\leq \frac{49-40}{^{6,3}/\_{\sqrt{1}}}\right)=P\left(-0,48\leq Z\leq 1,43\right)=0,1844+0,4236=0,608$$

(Jika dilihat ditabel distribusi normal ketika $z=0,48\rightarrow 0,1844$ dan $z=1,43\rightarrow 0,4236$)

1. Diketahui: $α=0,05$ dan $μ\_{A}>1,5$

Ditanyakan: a. apakah $μ\_{A}>1,5$ dan $σ\_{A}=10$

 b. selisih rata-rata sebenarnya

Jawaban:

1. Pengujian yang pertama
2. $H\_{0}:μ\_{A}=90$

$H\_{1}:μ\_{A}>90$

1. Karena $σ$ tidak diketahui maka distribusinya student
2. $H\_{0}$ ditolak jika:

$$t\geq t\_{1-α;n-1}\leftrightarrow t\geq t\_{0,95;9}\leftrightarrow t\geq 1,833$$

1. Nilai statistic: $t=\frac{\overbar{x}-μ\_{0}}{^{σ}/\_{\sqrt{n}}}=\frac{94,1-90}{\sqrt{\left(\frac{6349}{90}\right)\left(\frac{1}{10}\right)}}=1,54$
2. Karena $t\_{hitung}<t\_{tabel}$ maka $H\_{0}$ diterima yang artinya lama pemutaran film A sama dengan 90 menit.

 Pengujian kedua

1. $H\_{0}:σ\_{A}^{2}=100$

$H\_{1}:σ\_{A}^{2}\ne 100$

1. Distribusi chi kuadrat
2. $H\_{0}$ diterima jika:

$$χ\_{\frac{1}{2}α}^{2}<χ\_{}^{2}<χ\_{1-\frac{1}{2}α}^{2}\leftrightarrow χ\_{0,025;9}^{2}<χ\_{}^{2}<χ\_{0,975;9}^{2}\leftrightarrow 2,7<χ\_{}^{2}<19$$

1. Nilai statistic: $χ\_{}^{2}=\frac{\left(n-1\right)s^{2}}{σ\_{0}}=\frac{9\left(\frac{6349}{90}\right)}{100}=6,349$
2. Karena $χ\_{hitung}^{2}$ada didalam daerah penerimaan $H\_{0}$ maka $H\_{0}$ diterima. Yang artinya benar simpangan baku pemutaran film 10 jam
3. Selisih rata-rata

$$\left(\overbar{x\_{B}}-\overbar{x\_{A}}\right)-z\_{\frac{1}{2}γ}\sqrt{\frac{s\_{A}^{2}}{n\_{A}}+\frac{s\_{B}^{2}}{n\_{B}}}<μ\_{B}-μ\_{A}<\left(\overbar{x\_{B}}-\overbar{x\_{A}}\right)+z\_{\frac{1}{2}γ}\sqrt{\frac{s\_{A}^{2}}{n\_{A}}+\frac{s\_{B}^{2}}{n\_{B}}}$$

$$\left(101,5-94,1\right)-\left(1,64\right)\sqrt{\frac{\frac{6349}{90}}{10}+\frac{\frac{18665}{90}}{10}}<μ\_{B}-μ\_{A}<\left(101,5-94,1\right)-\left(1,64\right)\sqrt{\frac{\frac{6349}{90}}{10}+\frac{\frac{18665}{90}}{10}}$$

$$-1,24<μ\_{B}-μ\_{A}<16,04$$

1. Diketahui: $n\_{d}=300$; $n\_{p}=400$;$ x\_{d}=64$;$ x\_{p}=51$; $α=0,05$

Ditanya: apakah yang bolos di musim dingin lebih banyak dari pada dimusim panas

Jawab:

1. $H\_{0}:π\_{A}=π\_{B}$

$H\_{1}:π\_{A}>π\_{B}$

1. Distribusi normal
2. $H\_{0}$ ditolak jika:

$$z\geq z\_{\frac{1}{2}-α}\leftrightarrow z\geq 1,64$$

1. Nilai statistic: $Z=\frac{\frac{x\_{A}}{n\_{A}}-\frac{x\_{B}}{n\_{B}}}{\sqrt{pq\left(\frac{1}{n\_{A}}+\frac{1}{n\_{B}}\right)}}=\frac{\frac{64}{300}-\frac{51}{400}}{\sqrt{\left(\frac{23}{140}\right)\left(\frac{117}{140}\right)\left(\frac{1}{300}+\frac{1}{400}\right)}}=3,033$

Karena $z\_{hitung}>z\_{tabel}$ maka $H\_{0}$ ditolak, yang artinya memang benar banyaknya siswa yang membolos dimusim dingin lebih banyak daripada dimusim panas

1. $T=\left\{1,2,3,4,5,6\right\}$

Misal P(bukan prima) =b

$P\left(prima\right)=2P\left(bukan prima\right)\leftrightarrow P\left(prima\right)=2b$

$$P\left(T\right)=P\left(1\right)+P\left(2\right)+P\left(3\right)+P\left(4\right)+P\left(5\right)+P\left(6\right)$$

$$1=b+2b+2b+b+2b+b\leftrightarrow 1=9b\leftrightarrow b=\frac{1}{9}$$

Misal K adalah munculnya bilangan prima. $K=\left\{2,3,5\right\}$

Maka $P\left(K\right)=P\left(2\right)+P\left(3\right)+P\left(5\right)=2b+2b+2b=6b=\frac{6}{9}$

Peluang muncul bukan prima: $P\left(K'\right)=1-P\left(K\right)=1-\frac{6}{9}=\frac{3}{9}$

Y menang mendapatkan =500 $\rightarrow d\_{K}=500$

Y kalah member = 350 $\rightarrow d\_{K'}=-350$

1. $E\left(Y\_{menang}\right)=P\left(K\right)∙d\_{K}+P\left(K'\right)∙d\_{K'}=\left(\frac{6}{9}\right)\left(500\right)+\left(\frac{3}{9}\right)\left(-350\right)=\frac{1950}{9}$
2. Permainan adil $E\left(Y\_{menang}\right)=0$

$$E\left(Y\_{menang}\right)=P\left(K\right)∙d\_{K}+P\left(K^{'}\right)∙d\_{K^{'}}$$

$$0=\left(\frac{6}{9}\right)\left(500\right)+\left(\frac{3}{9}\right)\left(-X\right)\left(\frac{3}{9}\right)\left(X\right)=\left(\frac{6}{9}\right)\left(500\right)\leftrightarrow X=1000$$