

Hypothesis testing

Gipotezani tekshirish

Masala:

Kompaniya o'rtacha massasi 450 gramm bo'lgan kalkulyatorlar ishlab chiqaradi. Bir injener bunga ishonmadi va 50ta kalkulyatorlarni tarozida o'lchab ko'rmoqchi.

‘Null’ va ‘alternative’ gipotezalarni aniqlang.

- **H0(Null hypothesis): $\mu = 450$ gr**
- **Ha(Alternative hypothesis) $\mu \neq 450$ gr**

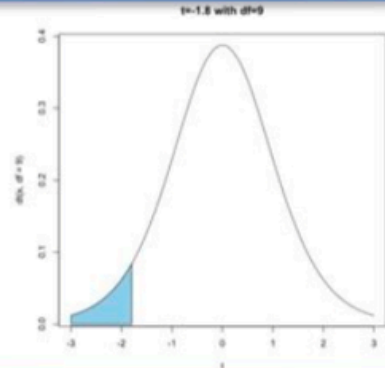
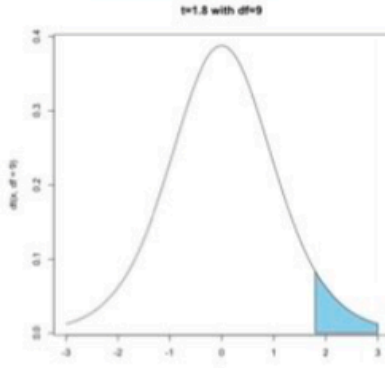
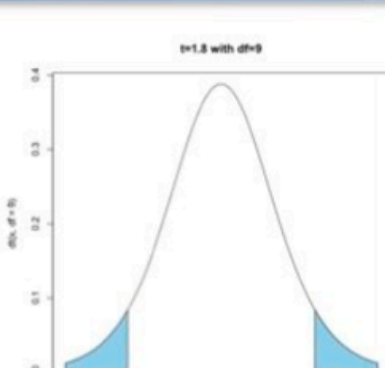
Masala (o'quvchilar uchun):

O'qituvchi kamida 80% o'quvchilar imtixonidan o'tadi deb hisoblaydi. Ammo bir o'quvchi gipotezani tekshirib ko'rmoqchi. Null va alternative hypothesisni yozing

Masala 2

O'qituvchi o'quvchilarning o'rtacha bahosi 2.7dan boshqacha bo'lishini test qilmoqchi. Null va alternative hypothesisni yozing

One-tailed vs two tailed tests

	H_a Description	Figure
One-tailed	Population mean is below the standard	 <p>A t-distribution plot with the title "t=1.8 with df=9". The x-axis is labeled "t" and ranges from -3 to 3. The y-axis is labeled "f(t, df=9)" and ranges from 0.0 to 0.4. The area under the curve to the left of t = -1.8 is shaded in light blue.</p>
One-tailed	Population mean is above the standard	 <p>A t-distribution plot with the title "t=1.8 with df=9". The x-axis is labeled "t" and ranges from -3 to 3. The y-axis is labeled "f(t, df=9)" and ranges from 0.0 to 0.4. The area under the curve to the right of t = 1.8 is shaded in light blue.</p>
Two-tailed	Population mean is different from the standard	 <p>A t-distribution plot with the title "t=1.8 with df=9". The x-axis is labeled "t" and ranges from -3 to 3. The y-axis is labeled "f(t, df=9)" and ranges from 0.0 to 0.4. The areas under the curve to the left of t = -1.8 and to the right of t = 1.8 are shaded in light blue.</p>

$$n < 30$$

σ is unknown

$$t = \frac{\bar{x} - \mu}{s/\sqrt{n}}$$

$$n < 30$$

σ known

$$z_c = \frac{\bar{x} - \mu_0}{\sigma/\sqrt{n}}$$

$$n > 30$$

σ is unknown

$$z_c = \frac{\bar{x} - \mu_0}{s/\sqrt{n}}$$

$$n > 30$$

σ is known

$$z_c = \frac{\bar{x} - \mu_0}{\sigma/\sqrt{n}}$$

$p \rightarrow \text{pop. proportion}$

$$z_c = \frac{\hat{p} - p}{\sqrt{\frac{pq}{n}}}$$

$$q = 1 - p$$