TODAY'S TOPIC | HYPOTHESIS TESTING

BY THE END OF CLASS, WE SHOULD KNOW

- Null and alternative hypothesis
- Hypothesis testing
- Significance level (α)
- One and two tailed tests

ALTERNATE HYPOTHESIS

(H_A)

PROPOSING

EXAMPLES

H_0

- The average monthly salary of a European adult is EUR 3000.

- The average height of the kids under seven years is less than hundred centimeters.

- The average house-rent in los angels is greater than or equal to 2000 USD.

H_A

- The average monthly salary of a European adult is not equal to EUR 3000.

- The average height of the kids under seven years is grater than or equal to hundred centimeters.

- The average house-rent in los angels is less than 2000 USD

HYPOTHESIS TESTING

ERRORS

Null hypothesis is	True	False
Rejected	Type – I error False positive Probability = α	Correct decision Probability = $1 - \beta$
Not rejected	Correct decision Probability = $1 - \alpha$	Type – II error False negative Probability = β

TYPE-1 ERROR

H_0 is true but we reject it.

SIGNIFICANCE LEVEL (α)

$$\alpha = P(\text{TYPE} - 1 \text{ ERROR})$$

TYPE-2 ERROR

H_0 is false but we failed to reject it.

$\beta = P(\text{Type} - 2 \text{ error})$

EXAMPLE

Which error is acceptable for the following?

H_0: Average battery life of a pacemaker is 300 days or less.
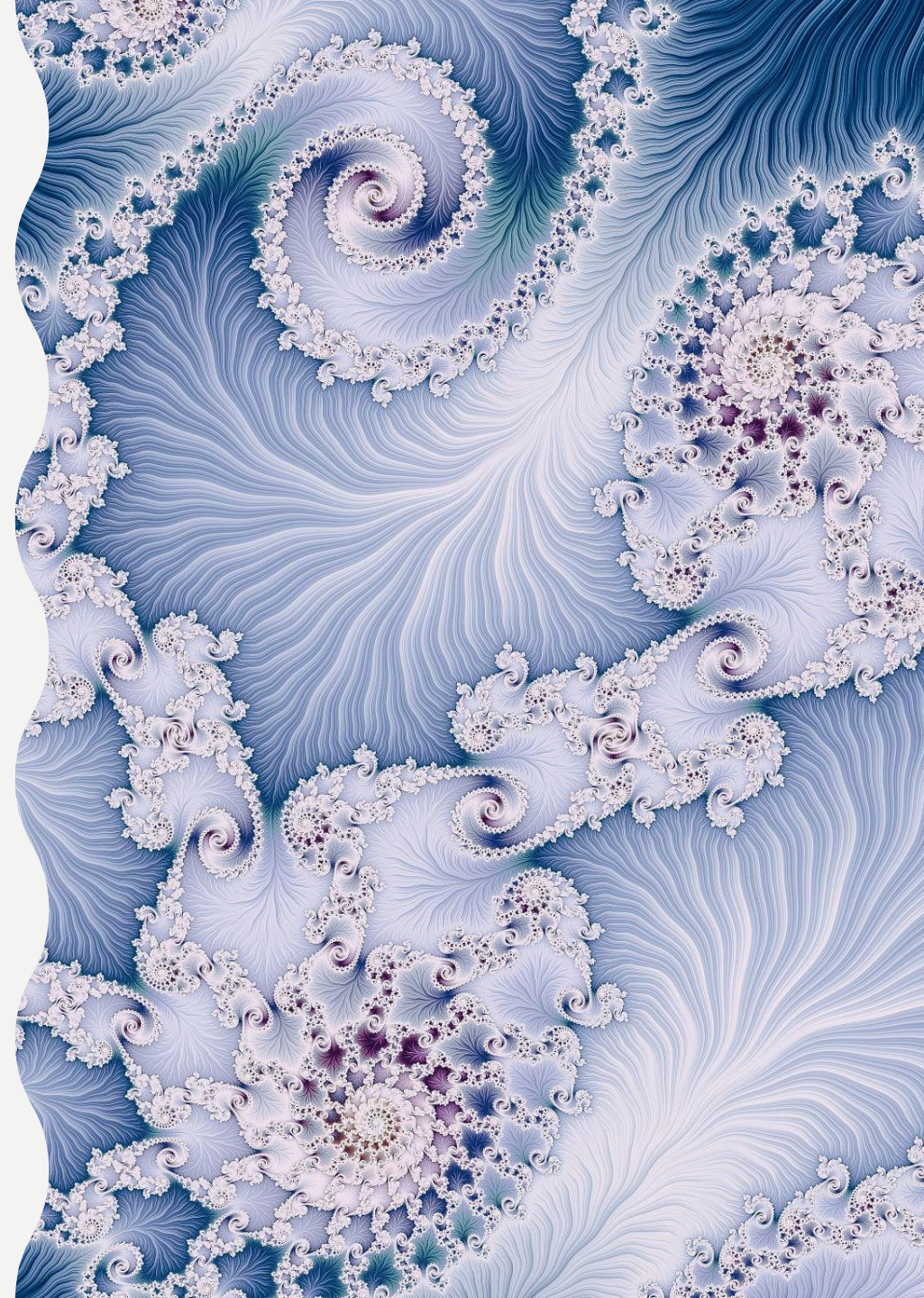
EXAMPLE ONE TAILED TEST

EXAMPLE TWO TAILED TEST

EXAMPLE

In recent years, the mean age of all college students in city X has been 23. A random sample of 42 students revealed a mean age of 23.8. Suppose their ages are normally distributed with a population standard deviation of $\sigma = 2.4$. Can we infer at $\alpha = 0.05$ that the population mean age has changed?

THANK YOU