P-Value

Hypothesis: More than 75% of class 2025 at Bryant have siblings.

$$H_0 : P \leq .75$$

$$H_1 : P > .75$$

Data :

ID	have siblings
1	Yes
2	Yes
3	No
4	No
⋮	⋮
35	Yes

OR

Number of students: 35

have siblings : 26

p. value : .626 > .05

not small

⇒ The data does not support
   -(our hypothesis

p- value : we will calculate the p-value.

p- value is the probability / chance that the data exist if H_0 is true.

① what happens if p-value is $\underline{0}$?

p- value = 0 means: If H_0 is true, there is NO chance the data exist.

If H_0 is true, you don't observe this data.

⇒ H_0 should not be true b|c you **Do** observe the data

H_0 is not true $\implies$ $\underline{H_1 \text{ is true}}$

② If p-value is extremely small (p-value $\leq$ .05)

Say p-value : $\underline{\underline{.01}}$. This means :

If H_0 is true, then there is $\underline{\underline{1\%}}$ chance the data exist

(or you observe the data)

almost
no chance

99% chance you observe different
data.

$\implies$ H_0 is almost certainly not true. We say :

The data support your hypothesis (H_1)

③ If p-value is not small (p-value > .05)

If H_0 is true, there is a "good" chance that you observe
the data.

H_0 may be true or not . H_1 may be true or not

The data does not support H_1. There is NO conclusion reached

Small p-value

(p-value $\leq .05$)

① There is evidence to support
your hypothesis (H_1)

② The data support H_1

③ Reject H_0

Not Small p-value

($p > .05$)

significant level

The data does not support H_1

Fail to reject H_0