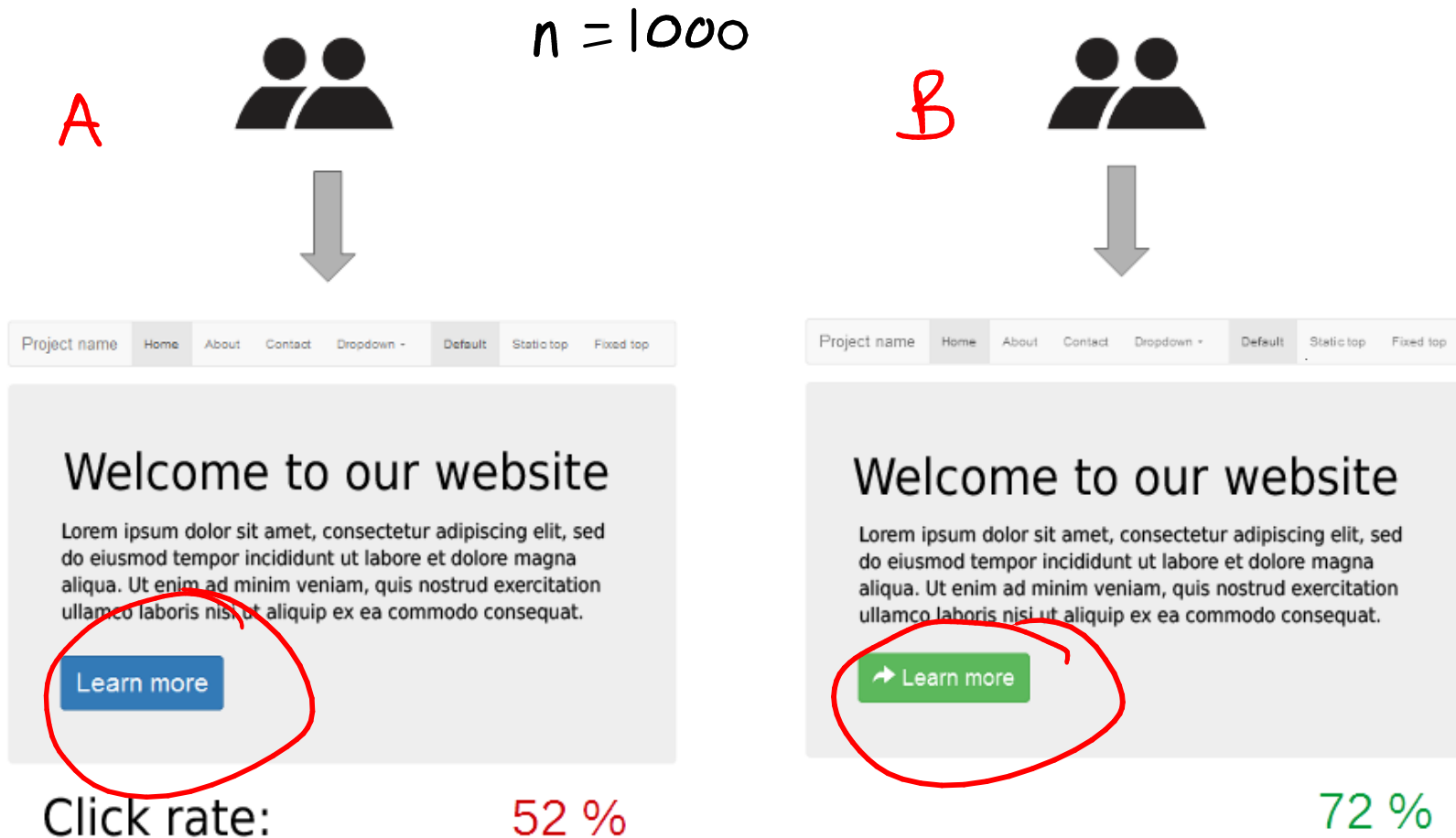
The background of the slide features a stylized globe on the left side, partially obscured by a dense pattern of binary code (0s and 1s) that recedes into the distance, creating a sense of depth and digital connectivity. The overall color palette is a mix of light blues, purples, and whites.

Foundations of Data Science: A/B testing - The principle of A /B testing

A / B Testing



Maxime Lorant, Wikimedia, CC S

A

4.0

1. Is A significantly better than B?
2. How much better is A than B?
x or worse?

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	24% ↑ Sign-ups		3,600% ↑ Social Shares		10% ↑ Click Rate		12.37% ↑ Sign-ups		

Boot strap for A/B Learning

$n = 1000$ show $A \times B$

$n_A = 700$ # click-throughs on A

$n_B = 720$ # " " " B

p_A - } parameter for proportion of
click-throughs from A/B
 p_B - }
← parameter for difference.

$$d = p_A - p_B$$

$$\hat{p}_A = \frac{n_A}{n}$$

$$\hat{p}_B = \frac{n_B}{n}$$

$$\hat{d} = \hat{p}_A - \hat{p}_B$$

Bootstrap (ctd)

B - # Bootstrap repetitions

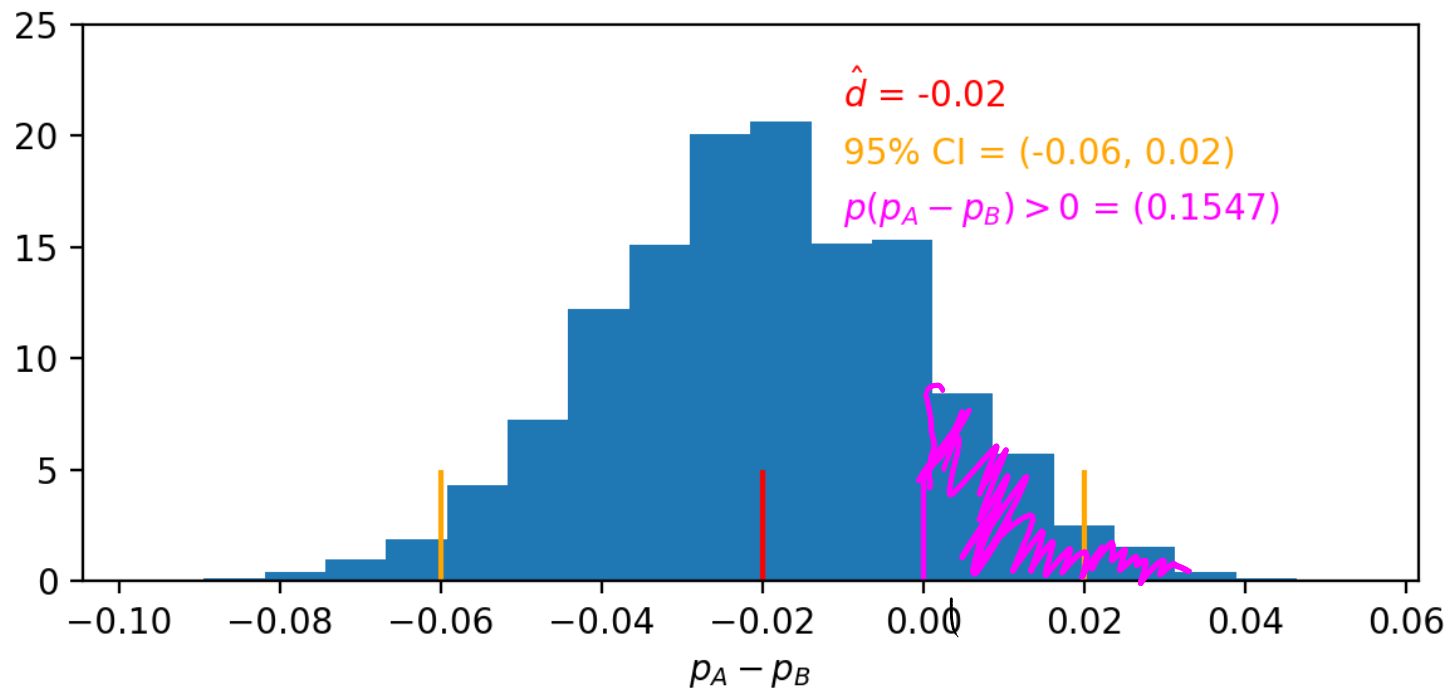
for j in $1, \dots, B$:

- Sample n_A^* from $\text{Binom}(n, \hat{p}_A)$
- " n_B^* " $\text{Binom}(n, \hat{p}_B)$
- Compute difference and store it .

$$d_j^* = \frac{n_A^*}{n} - \frac{n_B^*}{n}$$

Compute quantiles, std error in estimator.

Bootstrap results



$$\hat{d} = \hat{p}_A - \hat{p}_B = 0.70 - 0.72 = -0.02$$

15% chance A is better than B