

Question 1

- All resistors produced.
- The 1520 resistors tested.
- The *true* proportion of faulty resistors.
Symbol: p .
Value: unknown (must be estimated).
- The proportion of faulty resistors in the *sample*.
Symbol: \hat{p} .
Value: $\hat{p} = \frac{18}{1520} \approx 0.012 = 1.2\%$.
- Only looked at resistors produced during the morning shift. What about other times of the day?

Question 2

- All UL students.
- The 286 students who responded.
- The *true* mean time spent on Facebook.
Symbol: μ .
Value: unknown (must be estimated).
- The mean time based on the *sample*.
Symbol: \bar{x} .
Value: $\bar{x} = 1.5$ hours / day.
- What about the students who didn't reply? Even those who did - do we believe they are telling the truth?

Question 3

Age (years) - numeric discrete
Temperature - numeric continuous
Opinion of maths - categorical
Processor speed (GHz) - numeric continuous
Number of bugs - numeric discrete
Employment status - categorical

Gender - categorical
Time taken - numeric continuous
Distance - numeric continuous
Paying attention in class - categorical
File size (GB) - numeric continuous

Question 4

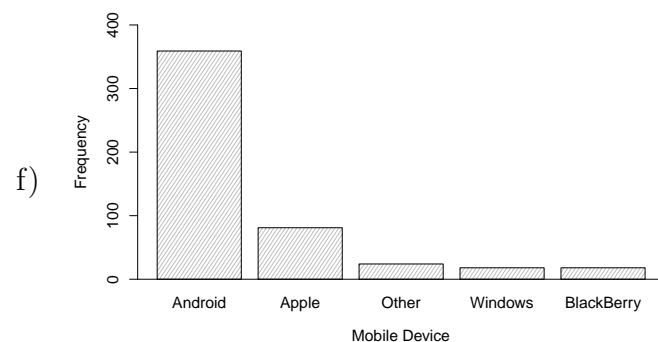
- $n = 359 + 81 + 24 + 18 + 18 = 500$.

Category	Freq.	R. Freq.
Android	359	$\frac{359}{500} = 0.718$
Apple	81	$\frac{81}{500} = 0.162$
Other	24	$\frac{24}{500} = 0.048$
BlackBerry	18	$\frac{18}{500} = 0.036$
Windows	18	$\frac{18}{500} = 0.036$
Total:	$n = 500$	$\frac{500}{500} = 1.000$

- $\hat{p}_{(\text{android/apple})} = 0.718 + 0.162 = 0.88$.

- $\hat{p}_{(\text{other})} = 0.048$.

- Value: unknown. Symbol: $p_{(\text{other})}$.



- Android now dominates the market.

Question 5

It is usually helpful to rearrange the data:

0.1	0.2	0.2	0.4	0.7	0.7	0.9	1.0	1.0	1.4
1.5	1.6	2.2	2.3	3.0	3.0	3.3	3.4	4.2	5.4
5.6	5.7	6.1	12.9	14.3					

- $n = 25$. $\bar{x} = \frac{\sum x_i}{n} = \frac{81.1}{25} = 3.244$ hours.
- width = $\frac{\max(x) - \min(x)}{\# \text{ of classes}} = \frac{14.3 - 0.1}{5} = \frac{14.2}{5} = 2.84$.
Always round up the width \Rightarrow width = 3.

Starting at 0 \Rightarrow 0 - 3, 3 - 6, 6 - 9, 9 - 12, 12 - 15.

Classes: 0 - 2.9, 3 - 5.9, 6 - 8.9, 9 - 11.9, 12 - 14.9.

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Question 5 - continued

b)

Class	Freq.	R. Freq.
0 - 2.9	14	$\frac{14}{25} = 0.56$
3 - 5.9	8	$\frac{8}{25} = 0.32$
6 - 8.9	1	$\frac{1}{25} = 0.04$
9 - 11.9	0	$\frac{0}{25} = 0.00$
12 - 14.9	2	$\frac{2}{25} = 0.08$
Total:	$n = 25$	$\frac{25}{25} = 1.00$



The data is skewed to the right.

- c) Relative frequencies in table above.
- d) $\hat{p}_{(>6 \text{ hrs})} = 0.04 + 0.00 + 0.08 = 0.12$.
- e) The true proportion is called a *parameter*.
Value: $p_{(>6 \text{ hrs})} = \text{unknown}$.