Class Exercise 1

Instructions

- Deadline: **Monday, January 26 (5:30)pm**
- Please show all of your work on your submission. Notation counts. Poor notation will result in a loss of marks.
- Please leave your answers as exact values. If using decimals, please report your answer to four decimal places.
- You are encouraged to ask your instructor for help, and/or discuss ideas with your classmates. However, you must produce fully explained individual solutions.
- Under no circumstances may you simply copy solutions obtained online or from a classmate.
- In unclear cases, you may be asked to explain your solutions in a Teams meeting, and your work may be refused altogether.

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1. **Matt Damon**

   The total cost of rescuing a stranded Matt Damon in all of his films (including Saving Private Ryan, Interstellar and The Martian) is an estimated $900 billion. The run times (in minutes) for 40 movies where Matt Damon needed to be rescued are shown below:

104	110	112	120	126	128	130	130	135	136
138	139	141	142	143	144	147	151	152	152
155	157	158	158	159	159	161	163	163	163
166	167	168	169	169	169	171	172	174	174

   (a) Organize the data using seven classes into a table showing the: class limits, class boundaries, the frequencies, relative frequencies (in decimal), the less-than cumulative frequencies (LTCF), the LCTF's in decimal, the more-than cumulative frequencies (MTCF), and the MCTF's in decimal.

   (b) What is the probability that a randomly Matt Damon film has a runtime of at least 148 minutes?

   (c) What is the probability that a randomly selected Matt Damon film has a runtime of 126 to 158 minutes?

   (d) What is the probability that the runtime of a randomly selected Matt Damon film is at most 125 minutes or is at least 170 minutes?

   (e) Decide between a bar chart and a histogram. Then sketch the graph of the relative frequencies (in percentages) for the run times of movies when Matt Damon needed to be rescued. Label your axes and comment on the shape of the graph (uniform, unimdoal, bimodal, skewed-left, skewed-right, symmetric, ...)

2. **Are You Dead?**

The most downloaded paid app in China is targeted at people living alone and is called Are You Dead? If the user doesn't confirm that they are alive for two days, the app notifies their emergency contact.

A researcher is studying how many paid apps people who live alone typically have installed on their phones, since apparently silence, like premium features, costs extra.Below are the numbers of paid apps found on 45 randomly selected phones (all owners live alone):

5	5	6	6	6	7	7	7	7	8	8	8	9	9	9
10	10	10	11	11	12	12	12	13	13	14	15	15	15	16
17	18	19	20	21	22	24	26	28	30	32	35	38	42	48

(a) Organize the data using **six classes** into a table showing the: class limits, class boundaries, the frequencies, relative frequencies, the less-than cumulative frequencies (LTCF), the LTCF's in decimal, the more-than cumulative frequencies (MTCF), and the MTCF's in decimal.

(b) What is the probability that a randomly selected phone has most 20 paid apps installed?

(c) What is the probability that a randomly selected phone has 37 or more paid apps installed?

(d) How many people have between 21 and 44 (inclusive) paid apps installed on their phones?

(e) Decide between a bar chart and a histogram. Then sketch the graph of the relative frequencies (in decimal) for the number of paid apps these individuals have on their phones. Label the axes and comment on the shape and characteristics of the graph.