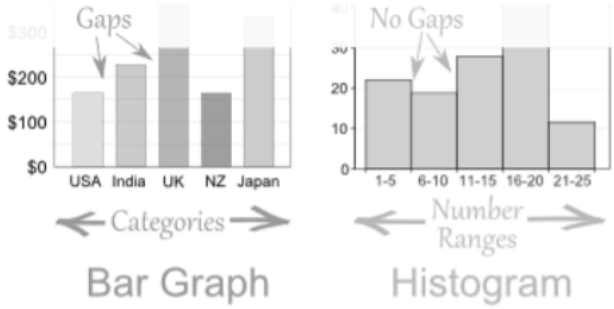
MBF 3C1 Name: _____

Displaying One-Variable Data

A **bar graph** uses bars to display discrete data which has been organized into classes. The bars have spaces between them since the data is discrete.

A **histogram** uses bars to display continuous data which has been organized into intervals. The bars in a histogram touch since the data is continuous.

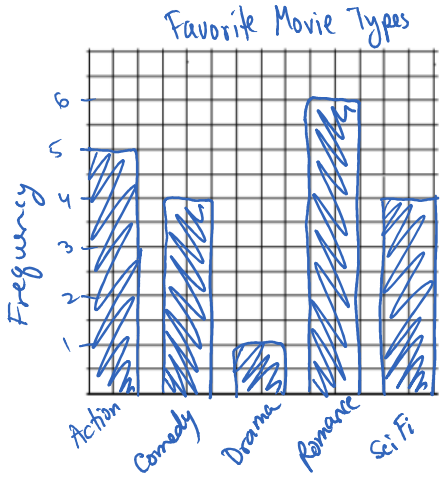


Example 1

Use the frequency table from Example 2 (about movies) from DAY 2 lesson to construct a bar graph.

Process:

1. organize data into frequency table with classes if necessary
2. draw and label axes
   * labels go under bars
3. plot bars
   * bars must have spaces between them
4. add a title

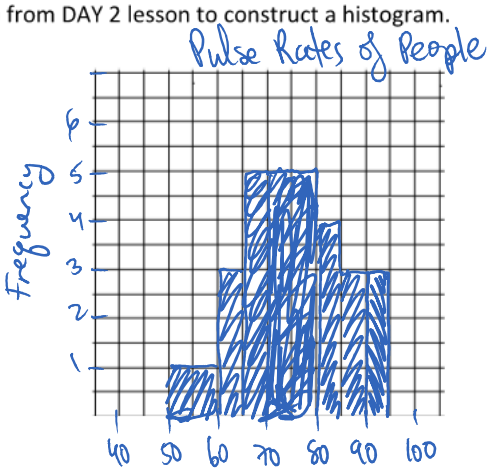


Example 2

Use the frequency table from Example 3 (about pulses) from DAY 2 lesson to construct a histogram.

Process:

1. organize data into frequency table with class intervals if necessary
2. draw and label axes
   * labels go between bars
3. plot bars
   * bars cannot have spaces between them
4. add a title



MBF 3C1 Name: _____

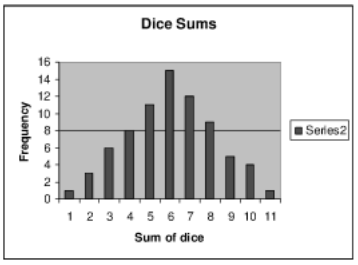
Bar graphs and histograms can take on any of several common shapes. Among these distributions are both ***SYMMETRICAL*** and ***SKEWED*** graphs.

SYMMETRICAL DISTRIBUTIONS can be:

1. Normal **Distributions**
   - commonly referred to as bell curves or mound-shaped distributions
   - the middle interval(s) will have the greatest frequency (i.e. the tallest bar)
   - all other intervals will have decreasing frequencies as you move away from the centre of the graph (i.e. the bars get smaller as you move out to the edges)

   Example: A pair of dice were rolled 75 times. After each roll, their sum was recorded and graphed.

Sum on dice	Frequency
2	1
3	3
4	6
5	8
6	11
7	15
8	12
9	9
10	5
11	4
12	1

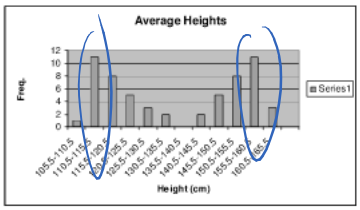


Note: Even though it isn't perfectly symmetrical, it still fits the definition of a normal distribution.

2. Bimodal **Distributions**
   - these look like inverted normal distributions
   - the intervals with the highest frequencies (i.e. tallest bars) are at either end of the graph and the interval with the lowest frequency is in the centre
   - frequencies increase as you move away from the centre of the graph.

   Example: Grade 6 and grade 1 students each measured, recorded and graphed their heights.

Height (cm)	Freq.
105.5-110.5	1
110.5-115.5	11
115.5-120.5	8
120.5-125.5	5
125.5-130.5	3
130.5-135.5	2
135.5-140.5	0
140.5-145.5	2
145.5-150.5	5
150.5-155.5	8
155.5-160.5	11



2 modes

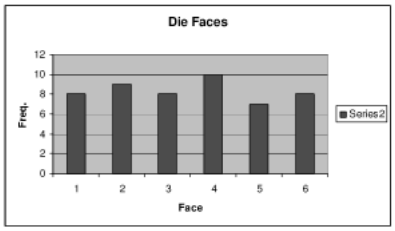
MBF 3C1 Name: _____

3. Uniform **Distributions**

- the frequencies of each interval are approximately equal

Example: A die is rolled 50 times. The face is recorded and graphed.

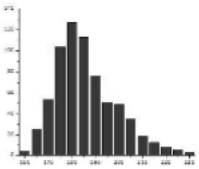
Die Face	Frequency
1	8
2	9
3	8
4	10
5	7
6	8



SKEWED DISTRIBUTIONS can be:

1. Right - Skewed **Graphs**

- the bars with the highest frequencies are on the left side and the frequencies decrease as you move right

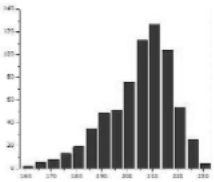


"Tail" in on the right

Note: Even though there is a low-frequency bar on the left side, the trend is still right-skewed.

2. Left - Skewed **Graphs**

- the bars with the highest frequencies are on the right side and the frequencies decrease as you move left



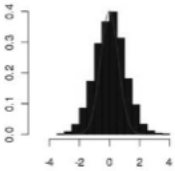
"Tail" is on the left.

Note: Even though there is a low-frequency bar on the right side, the trend is still left-skewed.

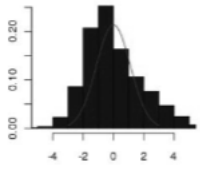
Example 3

Describe the distribution for each graph.

a.



b.

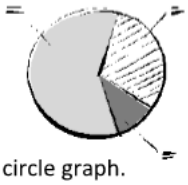


Normal (Bell)

Right skewed.

MBF 3C1 Name: _____

A **circle graph** uses sectors of a circle to show how discrete data is divided.

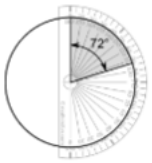


Example 4

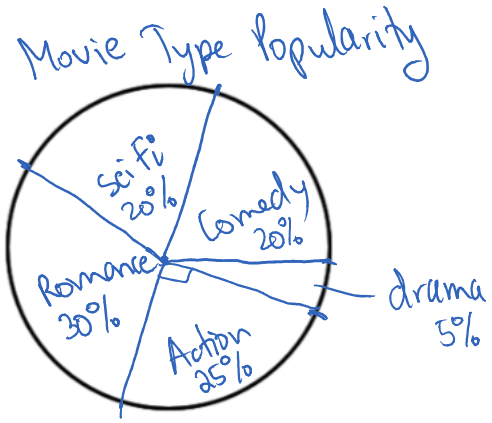
Use the frequency table from Example 2 (about movies) from DAY 2 to construct a circle graph.

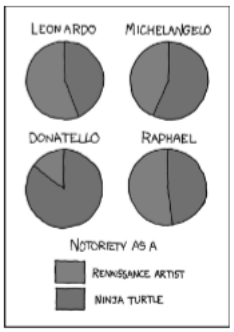
Process:

1. organize data into frequency table with classes if necessary
2. calculate the percent of each class
   * leave as decimal for future calculations
3. use the percentages to determine how many degrees each class consists of
4. draw a circle and divide it according to the calculations using a protractor
5. either label each section or provide a legend
6. add a title



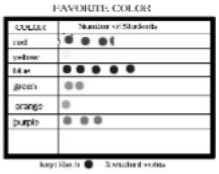
CLASS	FREQUENCY	PERCENT	DEGREES
action	5	$\frac{5}{20} = 0.25$	$0.25 \times 360° = 90°$
comedy	4	$\frac{4}{20} = 0.2$	$72°$
drama	1	$\frac{1}{20} = 0.05$	$18°$
romance	6	$\frac{6}{20} = 0.3$	$108°$
sci fi	4	$\frac{4}{20} = 0.2$	$72°$
TOTAL	**20**	**1.0**	**360°**





MBF 3C1 Name: _____

A **pictograph** uses images to display discrete data. Often 1 image represents more than 1 data piece. This type of graph is less accurate than other graphing styles.



Example 5

Use the frequency table from Example 2 (about movies) from DAY 2 to construct a pictograph.

Process:

1. organize data into frequency table with classes if necessary
2. draw and label axes
   * labels go under columns or beside rows of pictures
3. plot pictures
   * each picture represents a number of data pieces - this value must be stated
4. add a title