

Common Distribution Properties Lesson:

Histograms can take on any of several common shapes. Among these distributions are both *symmetrical* and *skewed* graphs.

Part 1: Symmetrical Distributions

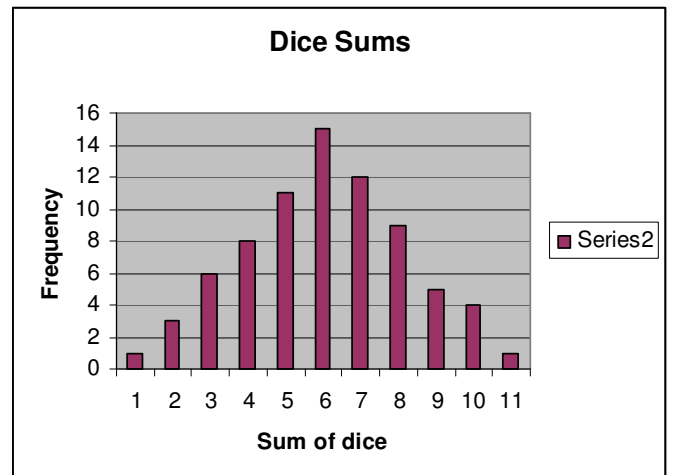
*Symmetrical distributions can be either *normal*, *bimodal* or *uniform*

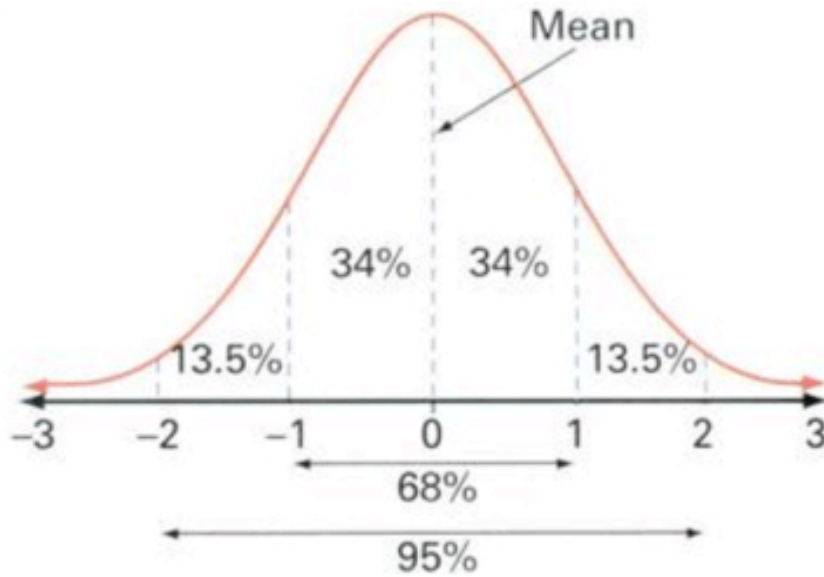
Data that are collected from a **large sample** of people or about a naturally occurring phenomena such as blood pressure, masses of infants, men's shoe sizes normally have a **normal** distribution.

- '**normal distribution**' refers to a particular way in which observations will tend to pile up around a particular value rather than be spread evenly across a range of values
- **most** applicable to continuous data
- Graphically best described by a 'bell-shaped' curve. This curve is described in terms of the point at which its height is maximum (its 'mean') and how wide it is (its 'standard deviation').
- 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).

Ex 1: 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





68% of the data lie within one standard deviation of the mean, and 95% of the data lie within two standard deviations of the mean

2. Bimodal Distributions

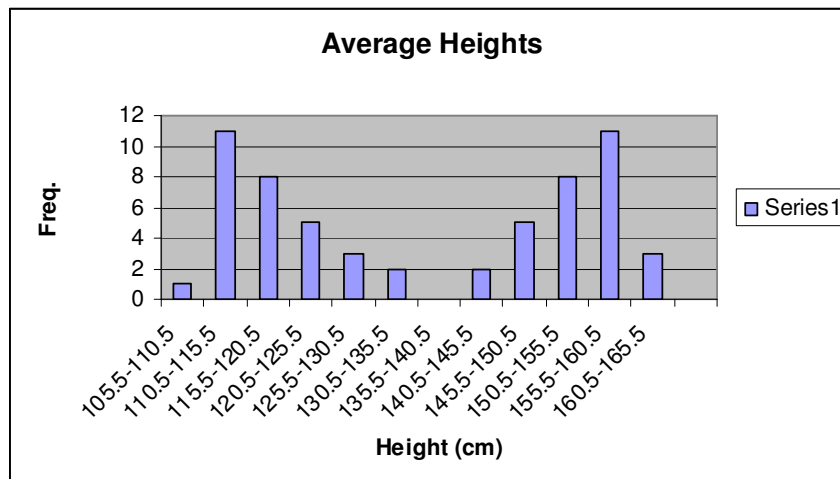
*These look like inverted normal distributions.

*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.

Ex 2: A class of grade 6 and grade 1 students each measured their heights.

They recorded and graphed them.

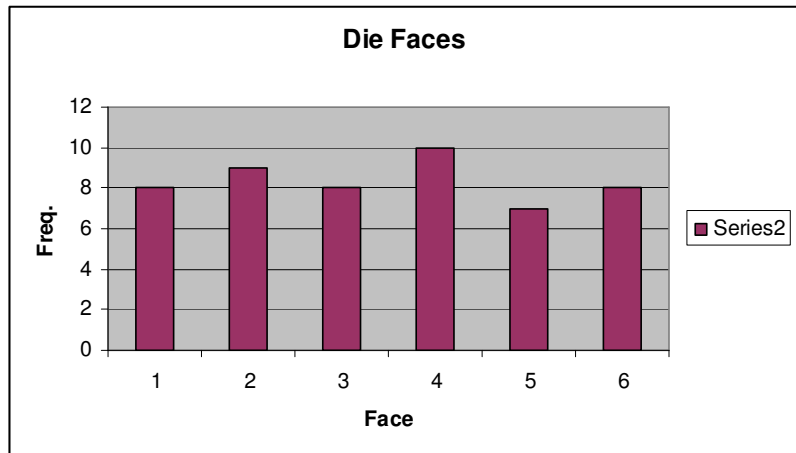


3. Uniform Distributions

*The frequencies of each interval are approximately equal.

Ex 3: A die is rolled 50 times. The face is recorded and graphed.

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

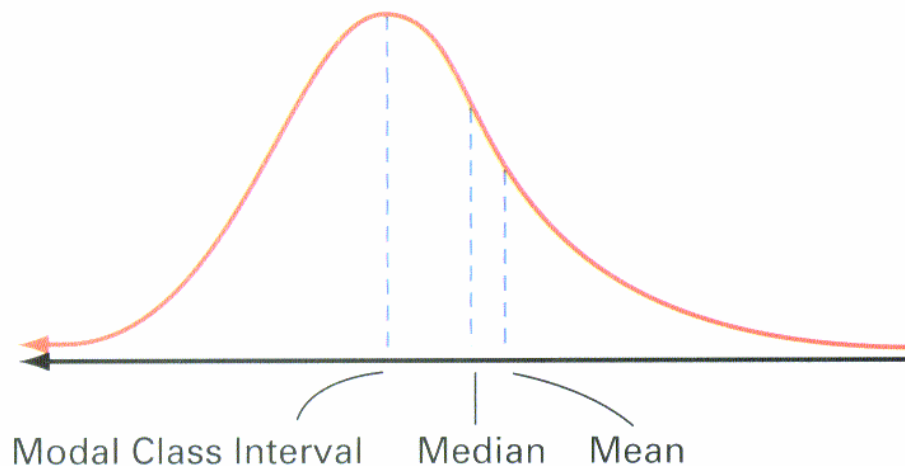


Part 2: Skewed Distributions

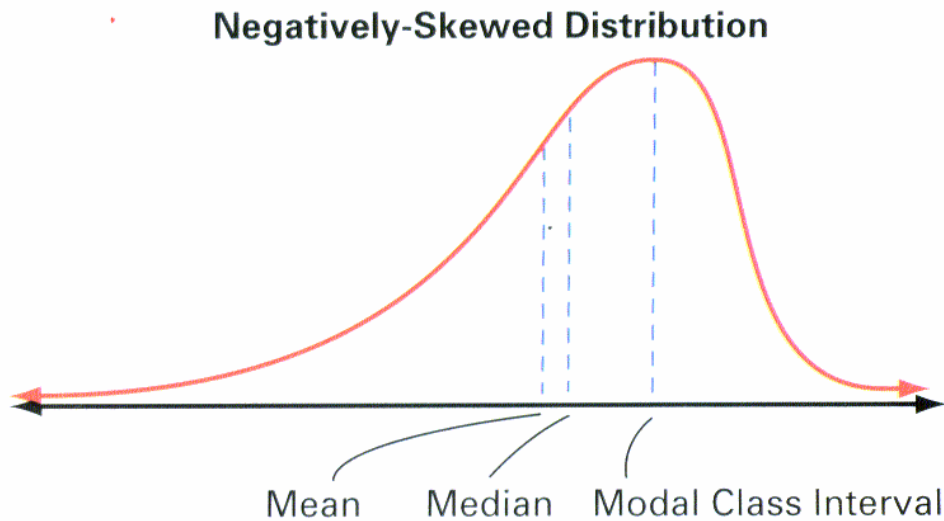
There are 2 kinds of skewed graphs:

1. In **right-skewed** (positively-skewed) graphs, the bars with the highest frequencies are on the left side and the frequencies decrease as you move right.

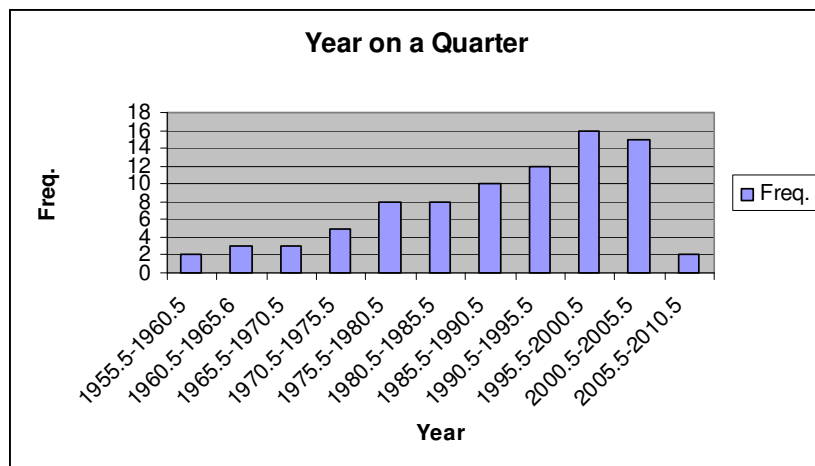
Positively-Skewed Distribution



2. In **left-skewed** graphs, the bars with the highest frequencies are on the right side and the frequencies decrease as you move left.



Ex 4: Sally picked up a handful of quarters. She recorded the year of each and made a graph.



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

