

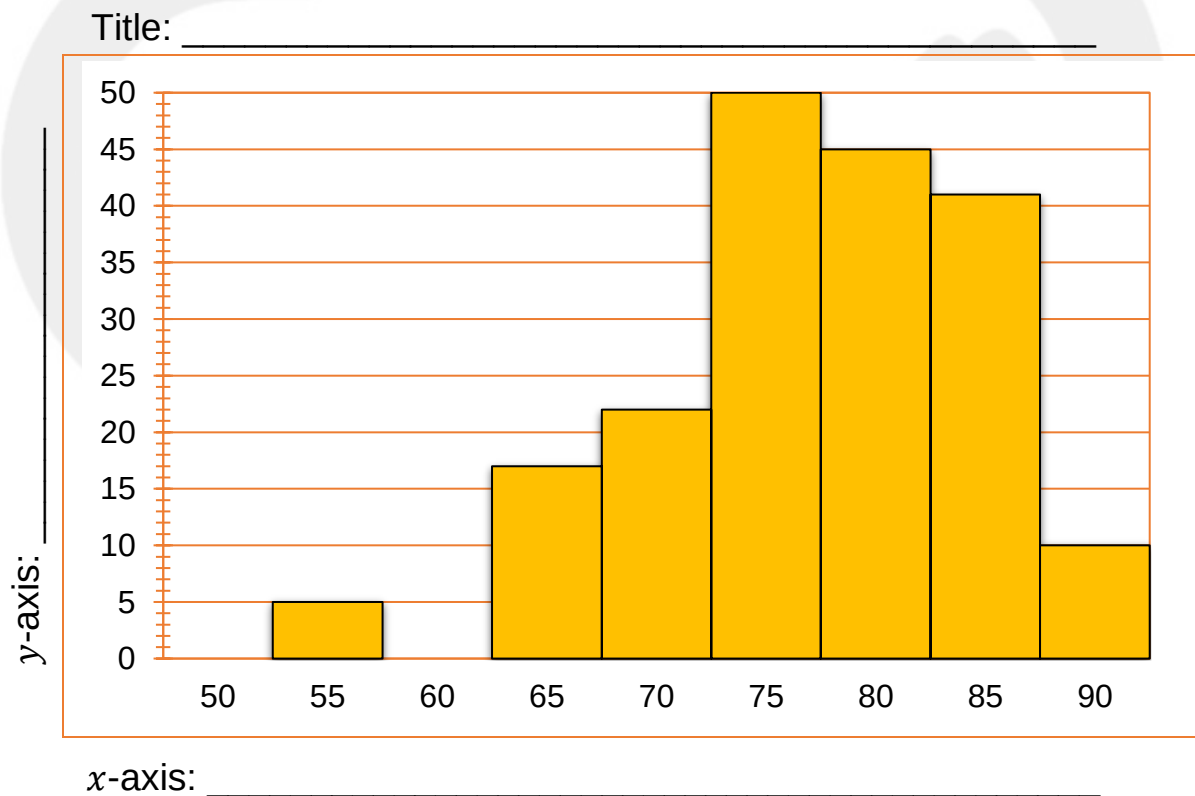
Histograms

Adult Heart Rates

A randomised street survey conducted by a research team in Sydney set out to measure the heart rates of adults aged between 25 and 45. Of all participants, 90% were male. The results are shown in the histogram below.

In the histogram below,

- Name the graph and the axes
- *Note: Each bar represents the frequency of participants falling within each heart rate category (beats per minute). Single measurements were only taken for each participant.*





Questions

1. Find the number of people that took part in this survey.

2. Determine the number of female participants.

3. Describe the skewness of the data in the histogram chart.

Note: If the tail of the distribution is to the left, the data is negatively skewed (skewed to the left). If the tail is to the right, the data is positively skewed (skewed to the right). Symmetrical distributions occur when the data is central. Bi-modal distributions have two peaks.

4. Research shows that athletic individuals are able to pump more oxygenated blood throughout their body per heartbeat. Would an athletic individual need a lower, higher or equal bpm (beats per min) to pump an equal volume of blood as a non-athletic individual?

5. Assume that a resting heart rate between 60 and 90 bpm is normal. What percentage of participants are within this range? How many of them are male?

6. The cardiac output (CO) of an individual is the volume of blood pumped by the heart to the body every minute. In addition, stroke volume (SV) is the volume of blood (litres) in a single heartbeat. Lastly, heart rate (HR) measures the number of heartbeats per minute.

(a) Write an equation for cardiac output. Include units in your equation.

(b) An adult has a cardiac output of 5L per minute and a heart rate of 80bpm. Using your equation, calculate the volume in millilitres of blood pumped throughout their body per heartbeat.

(c) Consider an individual with a stroke volume of 75mL and a heart rate of 85bpm. Find the cardiac output of this individual then calculate the volume of blood pumped in six minutes.



7. Determine the total volume of blood pumped across three minutes by all participants with a heart rate of 75bpm. Assume a stroke volume of 72mL.

8. The results of this research study could be used to learn more about the health of the general population. Describe the effectiveness and accuracy of these results in representing the health of males and females worldwide. List some limitations of the study and suggest any improvements that could be made.



A large rectangular area with a thin orange border, containing 20 horizontal black lines for writing. A large, faint, light gray watermark of the Cloud Tuition logo is centered in the background of this area.