# Prelim 1 – Solutions

## Q1 Solutions

1. Data analytics is the process of inspecting, cleaning and modelling data to discover useful information and support decision‑making.
2. Discrete distributions (e.g. binomial) and continuous distributions (e.g. normal).
3. An interactive tool for summarising data through grouping and aggregation.
4. A bar chart compares categories; a histogram displays the distribution of continuous data by grouping into bins.
5. Use plt.savefig(‘plot.png’).

## Q2 Solution

Descriptive summarises past events; diagnostic explains why they happened; predictive forecasts future outcomes; prescriptive recommends actions based on predictions.

## Q3 Solution

Ordered data: {6,7,8,9,10,11,15}. Q1=7, median=9, Q3=11, min=6, max=15. Draw a box from 7 to 11 with median line at 9; whiskers extend to 6 and 15. The point 15 may be an outlier.

## Q4 Solution

Prepare data in a table, insert a pivot table summarising key metrics, create pivot charts, add slicers for interactivity, and arrange elements neatly on a dashboard sheet.

## Q5 Solution

Pie charts show part‑to‑whole relationships. To format: add a title, labels, choose colours and explode slices to emphasise categories.

## Q6 Solution

import matplotlib.pyplot as plt  
months = ['Jan','Feb','Mar','Apr']  
sales = [100,120,150,170]  
profit = [20,25,35,40]  
plt.figure(figsize=(6,4))  
plt.plot(months, sales, marker='o', label='Sales')  
plt.bar(months, profit, alpha=0.5, label='Profit')  
plt.title('Sales and Profit')  
plt.xlabel('Month')  
plt.ylabel('Amount')  
plt.legend()  
plt.show()

The program overlays bar and line charts on the same axes and adds labels and a legend.