Learning outcomes: Chapter 3

1. You should understand the terms random variable, population, observation, data and sample.

2. You should know the difference between qualitative and quantitative data, and you should understand that quantitative data can be further subdivided into discrete data and continuous data. You should also be familiar with the terms ordinal data, categorical data and count data.

3. You should be able to give a brief description, an example, and advantages/disadvantages of the following sampling schemes:
   - Random sampling: Simple random sampling; stratified random sampling;
   - Quasi–random sampling: Systematics sampling; multi–stage sampling;
   - Non–random sampling: Cluster sampling; judgemental sampling; accessibility sampling; quota sampling.

4. You should be able to construct, and interpret, frequency/relative frequency tables for categorical, count and continuous data.

5. You should be able to construct, and interpret, the following graphical summaries for data. You should also know the advantages/disadvantages/limitations of each:
   - Stem–and–leaf plots
   - Bar charts
   - Histograms: frequency/frequency density; relative frequency; polygons
   - Ogives
   - Box–and–whisker plots
   - Others: multiple bar charts; pie charts; scatter plots; time series plots

6. You should be able to calculate the following numerical summaries of data:
   - Measures of average: arithmetic mean (from raw data/frequency table); median; mode (and modal class from grouped data)
   - Measures of spread: range; inter–quartile range; variance/standard deviation (from raw data/frequency table)

   You should also know when it is appropriate to use one numerical summary over another.