UNIT 6: BUSINESS DECISION MAKING

WEEK EIGHT

LECTURER: N. QUARRIE

Learning Outcome Two (2)

- LO3 Be able to produce information in appropriate formats for decision making in an organisational context.

Objective

- By the end of this lesson you should be able to:
- 3.1 produce graphs using spreadsheets and draw valid conclusions based on the information derived

Overview

- Last week's session focused on how to calculate and interpret correlation coefficient etc. This week we want to take a look at how to create graphs using data collected.

- Some of the graphs that we will look at includes line, pie, bar charts and histograms.

Note!

- Please note that the procedures used to produce all the mentioned graphs in excel is the same. I decided therefore to explicitly show you how to do one (line graph). Once you know how to do this you will be able to do the others.

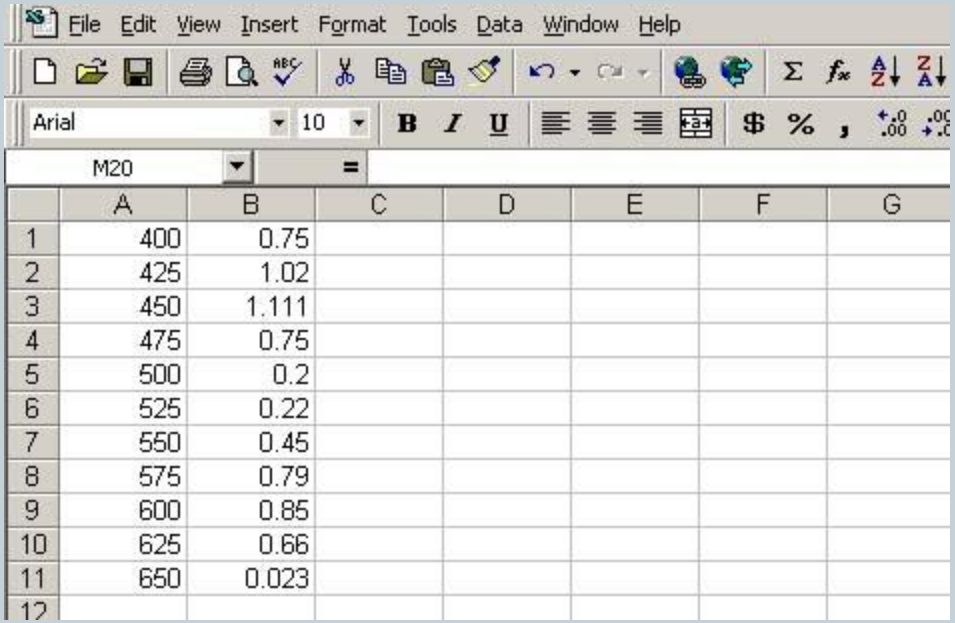
Line Graph

- According to (Mste.illinois.edu, 2016): “Line graphs compare two variables. Each variable is plotted along an **axis** . A line graph has a vertical axis and a horizontal axis. So, for example, if you wanted to graph the height of a ball after you have thrown it, you could put time along the horizontal, or x-axis, and height along the vertical, or y-axis.”

Line Graph: Example using Excel

(Uic.edu, 2016)

- Just say you've just taken your data for an absorption spectrum and you need to generate the curve. First of all, open MS Excel and enter your data in columns:

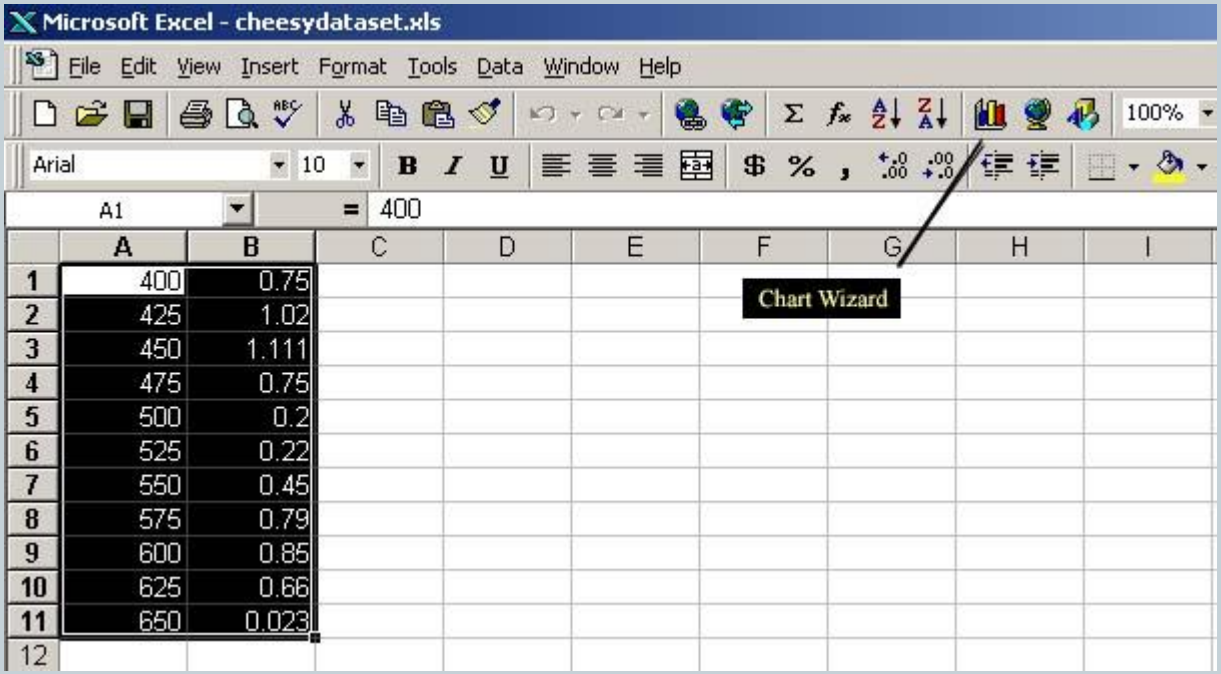


	A	B	C	D	E	F	G
1	400	0.75					
2	425	1.02					
3	450	1.111					
4	475	0.75					
5	500	0.2					
6	525	0.22					
7	550	0.45					
8	575	0.79					
9	600	0.85					
10	625	0.66					
11	650	0.023					
12							

Line Graph: Example using Excel

(Uic.edu, 2016)

- Next, put the mouse on cell A1, then click and hold the left mouse key and drag until all of the data set is blocked out like so:



	A	B
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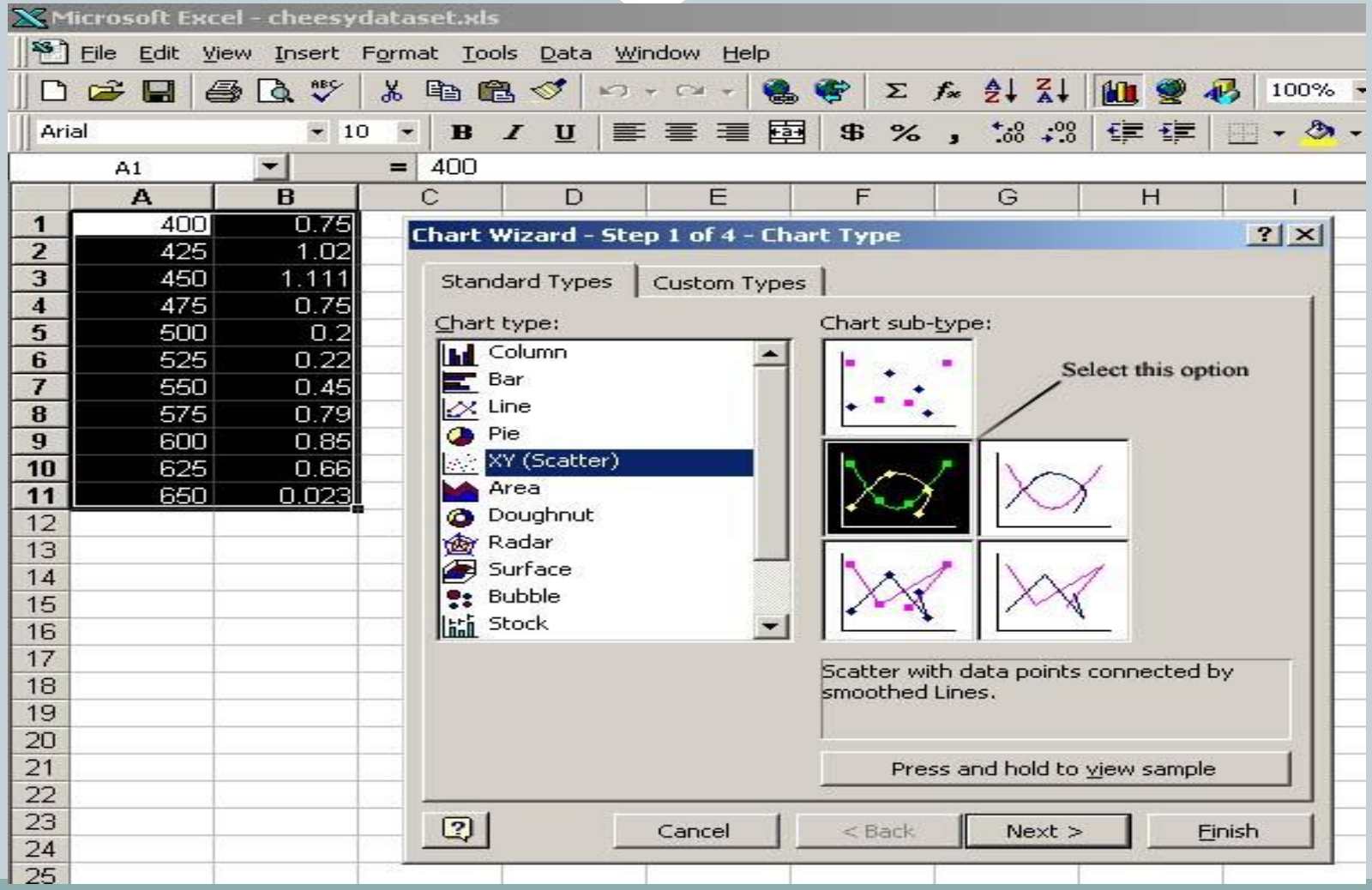
Line Graph: Example using Excel

(Uic.edu, 2016)



Line Graph: Example using Excel

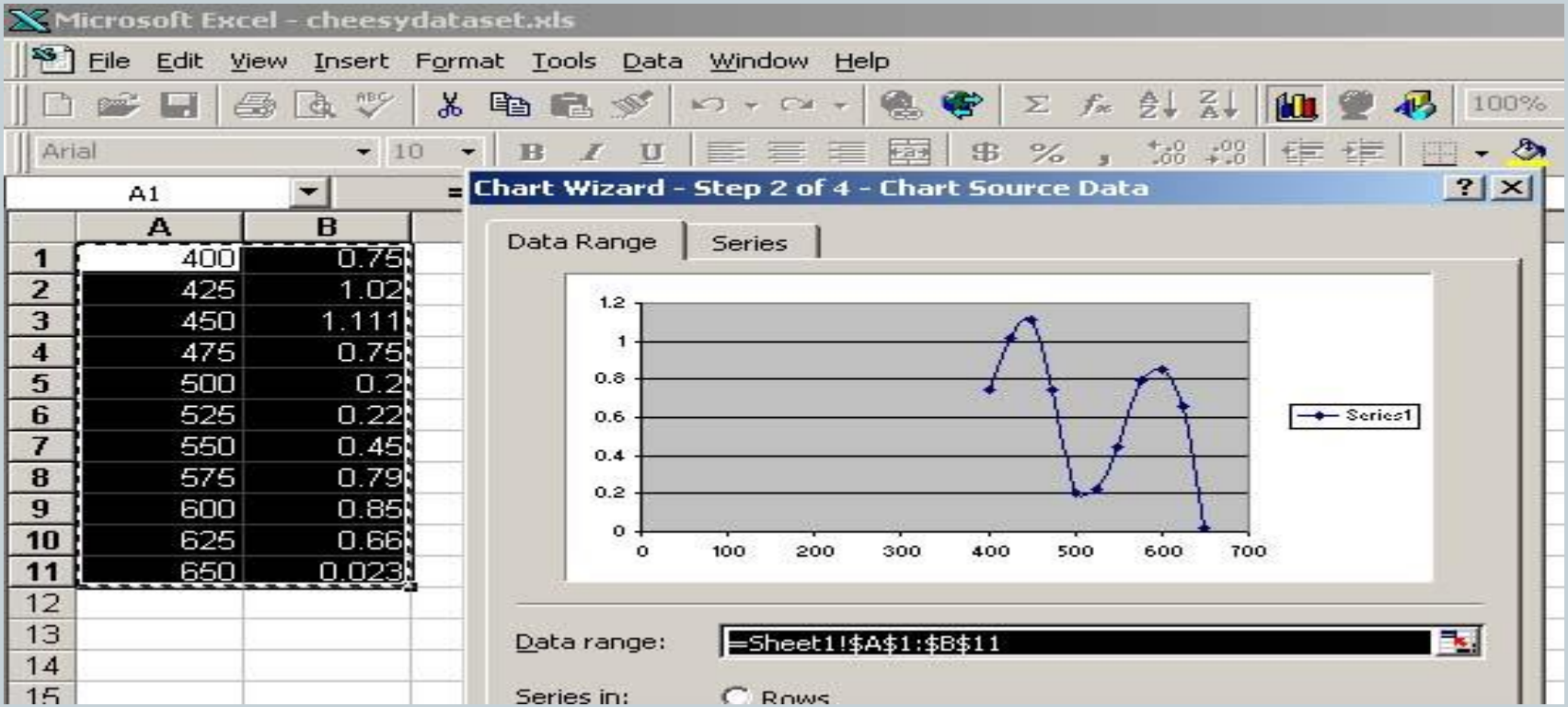
(Uic.edu, 2016)

- "Next, click on the Chart Wizard Button (or click on the Insert menu then select the chart option)
- You will then be presented with a series of options
- First, you must select your graph type. Select XY (Scatter).
- Second, you need to select a type of XY Scatter plot. You want to select the option that will create a flowing line graph that still shows the data points"

Line Graph: Example using Excel

(Uic.edu, 2016)

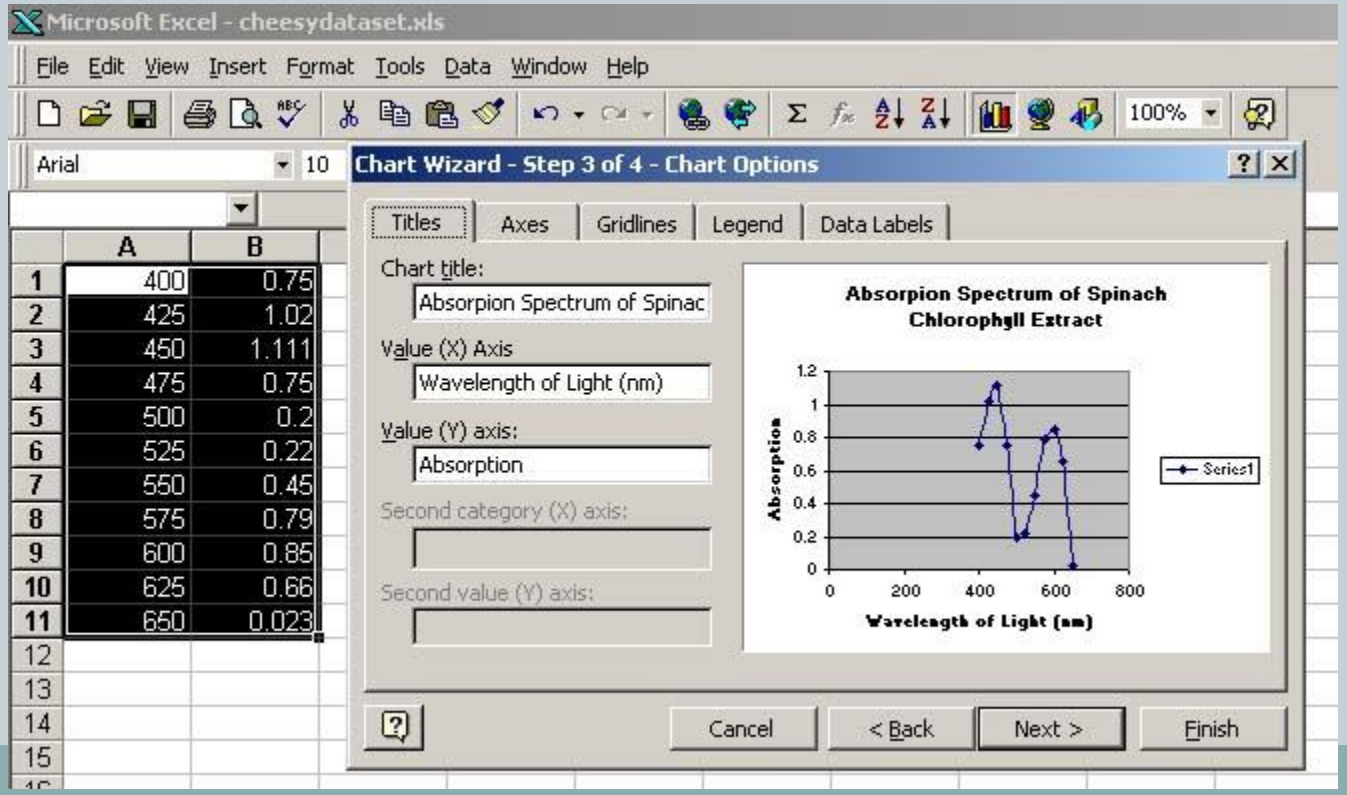
- Click on the Next Button and you will be presented with a rough sketch of your graph



Line Graph: Example using Excel

(Uic.edu, 2016)

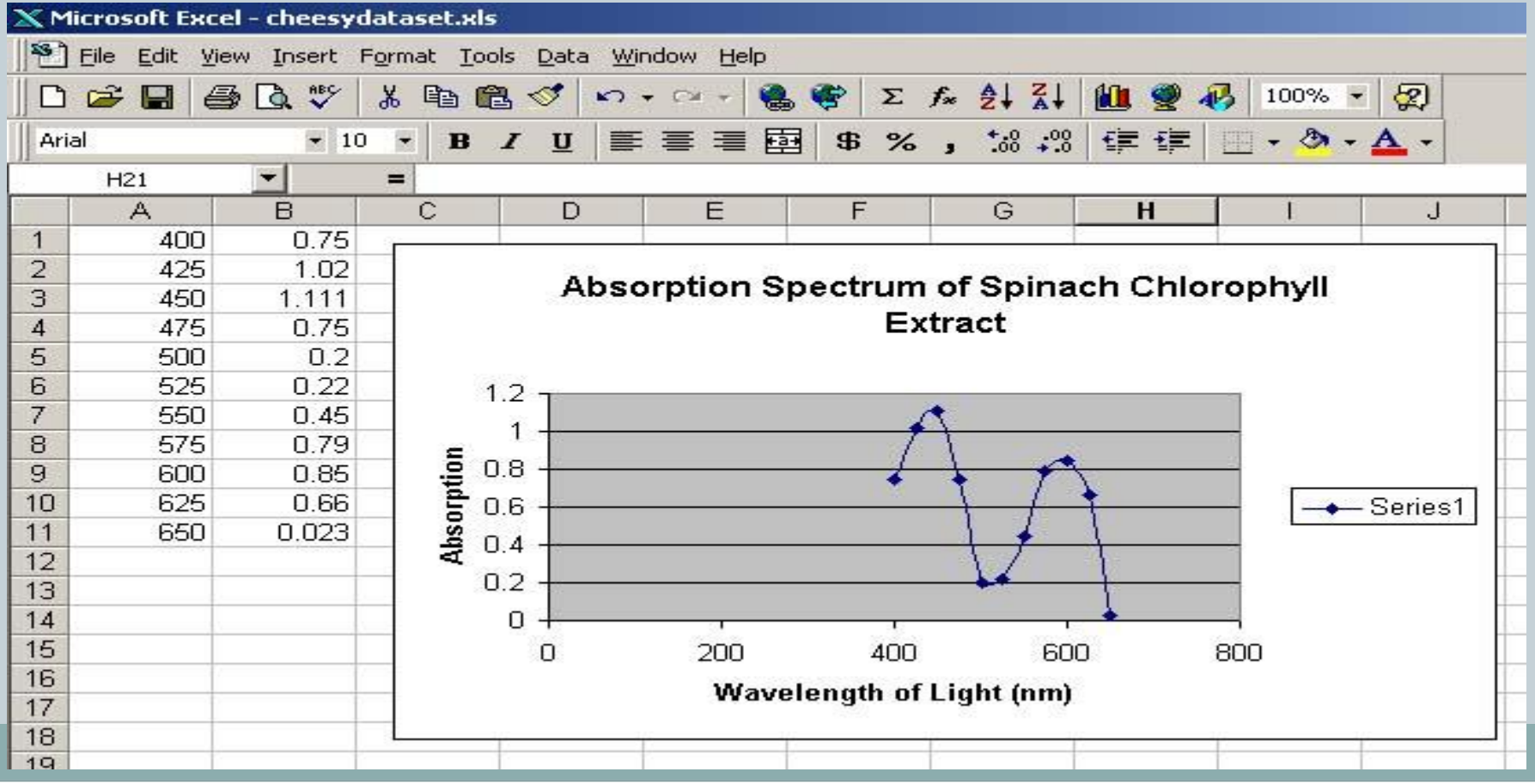
- Click on the Next button on the lower right of the box and you will move to another screen. Enter the title of your graph (Absorption Spectrum of Spinach Chlorophyll Extract) and label the X and Y axes (Wavelength of Light (nm) and Absorption respectively). Then click Next



Line Graph: Example using Excel

(Uic.edu, 2016)

- A fourth window will pop up. Just hit the Finish button and the screen should look like this:

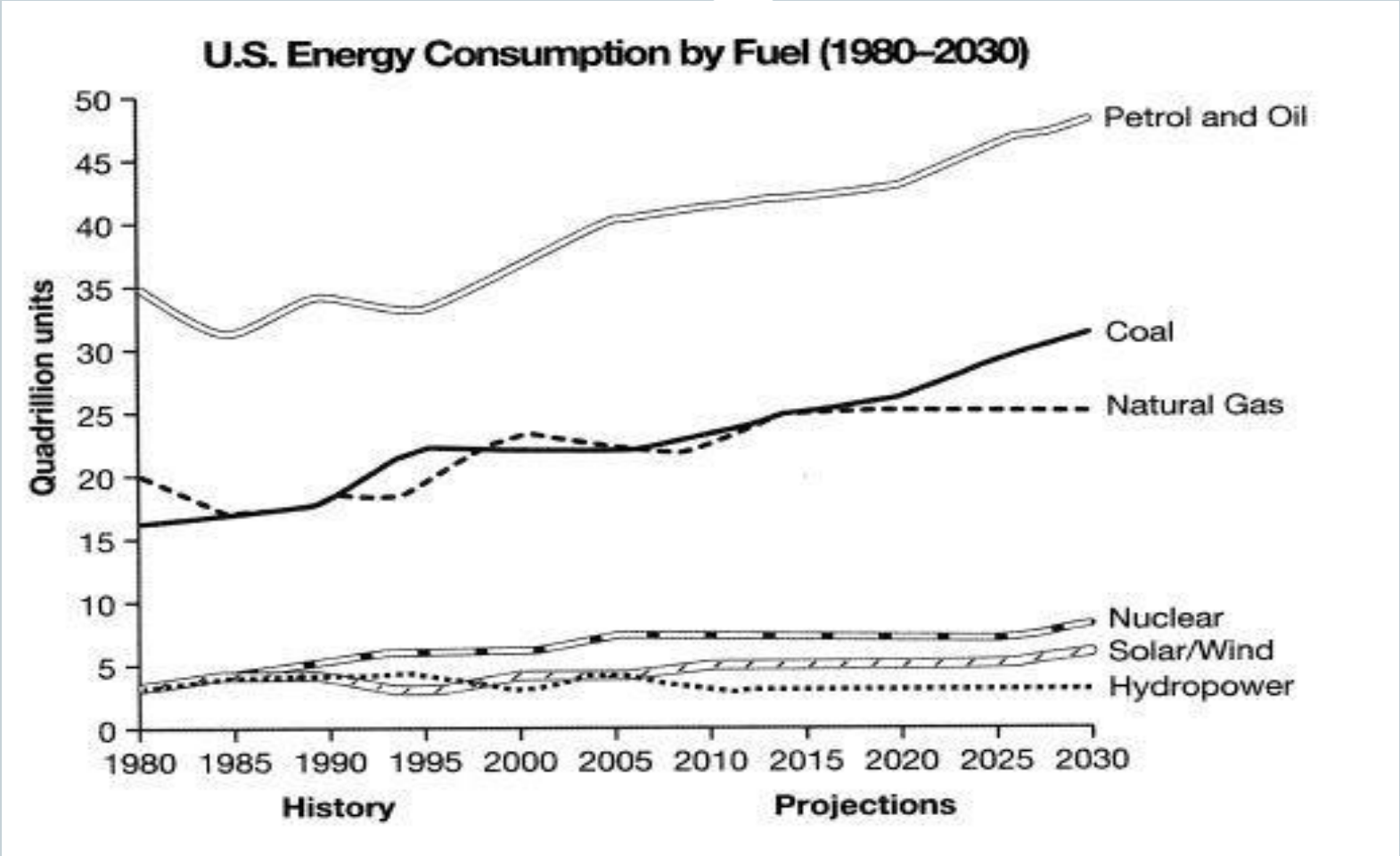


Constructing Bar Chart, Pie Chart, Histogram

- Use the same steps previously highlighted. Simply choose the relevant charts pie chart, bar graph etc from the chart option.

Line Chart: Drawing conclusion-Example

(Pell, 2015)



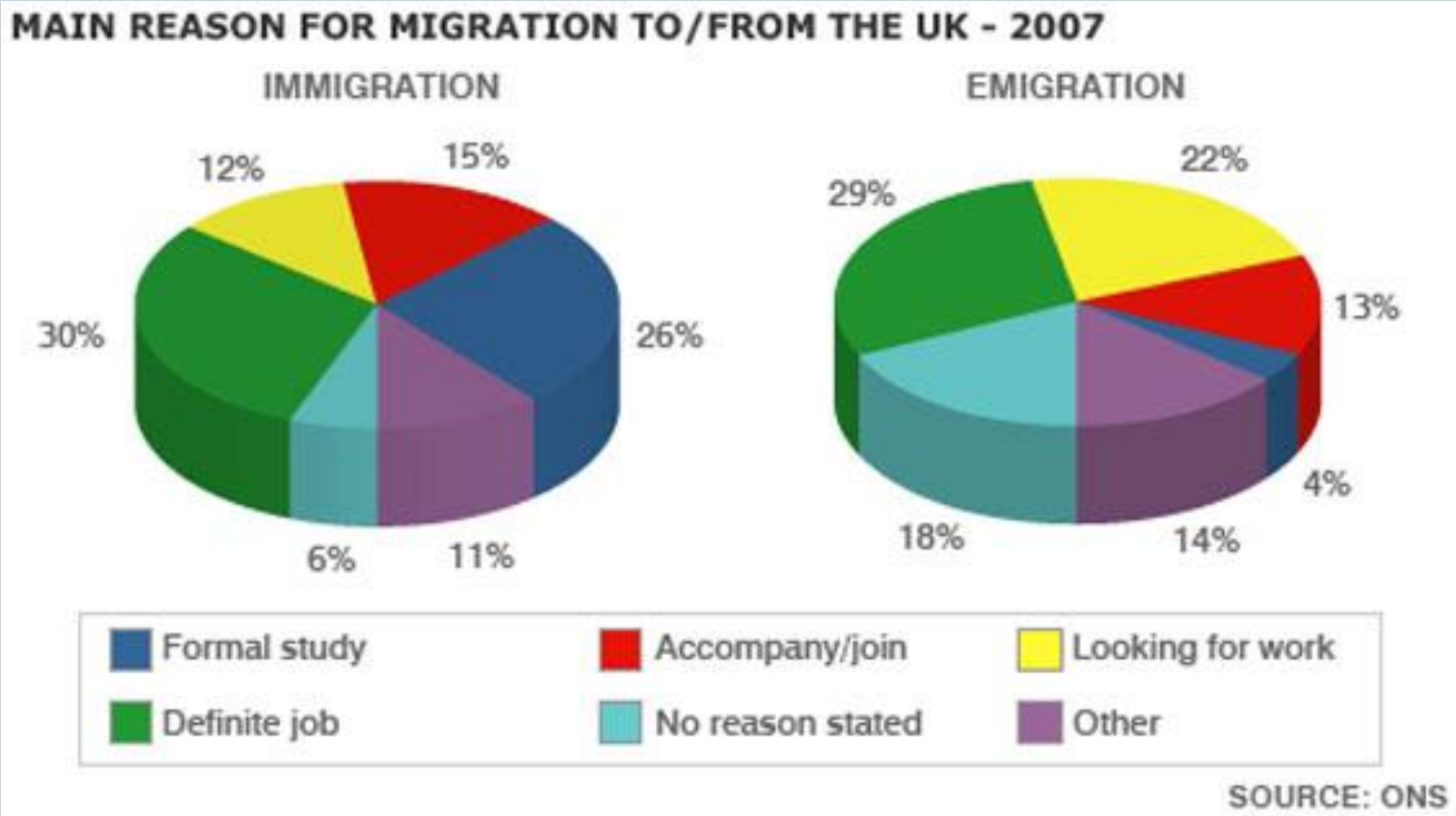
Line Chart: Drawing conclusion-Example

(Pell, 2015)

- "The line graph shows energy consumption by fuel type in the United States from 1980-2008, with projected use until 2030.
- Overall, fossil fuels have been the dominant type and will continue this trend in to the future. Nuclear and renewable energy sources have represented a small but significant proportion of total energy use and despite small projected gains; it is projected that they will continue doing so.
- Petrol and Oil command the biggest share with 35 quadrillion units (35q) in 1980, rising to approximately 40q in 2008 and this trend is set to continue with a projected value of nearly 50q in 2030. In 1980 natural gas and coal came in second and third, with around 16q and 20q respectively. However, coal overtook natural gas in 1990 and despite some fluctuation, is set to be the second most used fuel in 2030 with just over 30q. It is predicted that natural gas will level off and remain relatively constant at about 25q.
- Nuclear and the renewable energies all represented around 4q in 1980 and fluctuated up until 2008. It is speculated that nuclear energy will reach 10q by 2030 and solar/wind around 5q, with hydropower dropping and then remaining constant at approximately 2q."

Pie Chart: Drawing conclusion-Example

Source: (IELTS buddy, 2016)



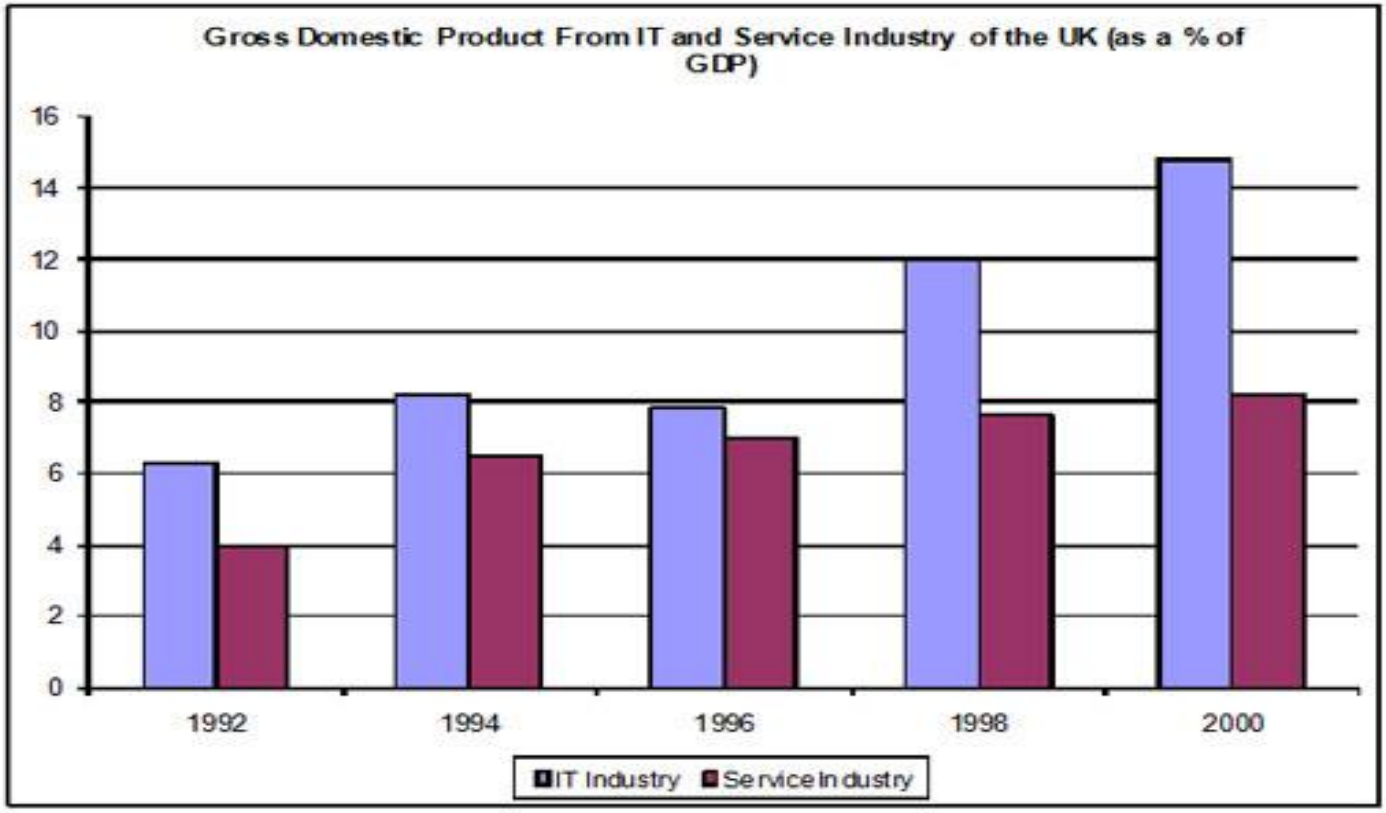
Pie Chart: Drawing conclusion-Example

(IELTS buddy, 2016)

- "The pie charts illustrate the primary reasons that people came to and left the UK in 2007. At first glance it is clear that the main factor influencing this decision was employment.
- Having a definite job accounted for 30 per cent of immigration to the UK, and this figure was very similar for emigration, at 29%. A large number of people, 22%, also emigrated because they were looking for a job, though the proportion of people entering the UK for this purpose was noticeably lower at less than a fifth.
- Another major factor influencing a move to the UK was for formal study, with over a quarter of people immigrating for this reason. However, interestingly, only a small minority, 4%, left for this.
- The proportions of those moving to join a family member were quite similar for immigration and emigration, at 15% and 13% respectively. Although a significant number of people (32%) gave 'other' reasons or did not give a reason why they emigrated, this accounted for only 17% with regards to immigration."

Bar Chart: Drawing conclusion-Example

(IELTS buddy, 2016)



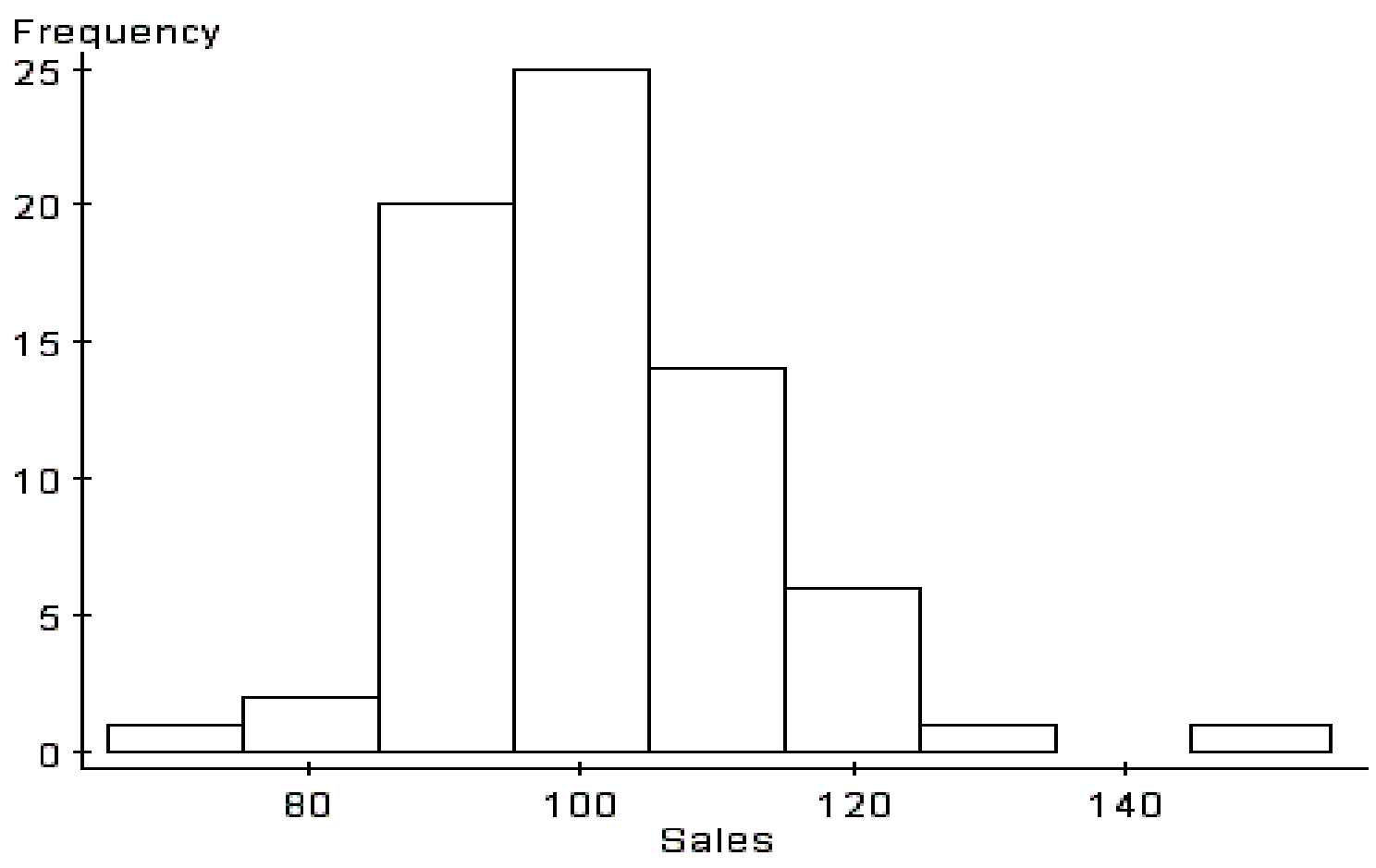
Bar Chart: Drawing conclusion-Example

(IELTS buddy, 2016)

- "The bar chart illustrates the gross domestic product generated from the IT and Service Industry in the UK from 1992 to 2000. It is measured in percentages. Overall, it can be seen that both increased as a percentage of GDP, but IT remained at a higher rate throughout this time.
- At the beginning of the period, in 1992, the Service Industry accounted for 4 per cent of GDP, whereas IT exceeded this, at just over 6 per cent. Over the next four years, the levels became more similar, with both components standing between 6 and just over 8 per cent. IT was still higher overall, though it dropped slightly from 1994 to 1996.
- However, over the following four years, the patterns of the two components were noticeably different. The percentage of GDP from IT increased quite sharply to 12 in 1998 and then nearly 15 in 2000, while the Service Industry stayed nearly the same, increasing to only 8 per cent.
- At the end of the period, the percentage of GDP from IT was almost twice that of the Service Industry."

Histogram: Drawing conclusion-Example

(Nku.edu, 2016)



Histogram: Drawing conclusion-Example

(Nku.edu, 2016)

- This newspaper typically sold about 100,000 copies per day. Sales between 90,000 and 110,000 were quite frequent.
- For this sample of 70 days' sales, the smallest number of newspapers sold was about 70,000 and the largest is about 150,000.
- There were an unusually large number of newspapers sold one day. The day on which 150,000 newspapers were sold is atypical.
- Finally, due to the atypical large value, the histogram is slightly skewed to the right, or positively skewed. Without this value, the histogram would be reasonably symmetric.

Videos: Using Excel to produce line chart, pie chart, histogram, bar chart.

1. Line Graph: https://www.youtube.com/watch?v=Rn_275psJFc

2. Bar Graph: https://www.youtube.com/watch?v=aBV2vvTFI84

3. Pie Chart: https://www.youtube.com/watch?v=5kyU3Nh7u38

4. Histogram: https://www.youtube.com/watch?v=RyxPp22x9PU

Review Questions

1. Explain the steps that should be followed whenever you produce to produce line chart, pie chart, histogram, bar chart.

2. a. Assume that you collected data from students regarding their age and grades received in a Statistics class that it is represented in the table below. Produce to produce line chart, pie chart, histogram, bar chart.

X (age)	Grade
23	50
19	70
30	100
27	20
29	16
50	45

2b. Interpret the results from part "a"

References/Additional Reading List

- 1. Excel-easy.com, (2016). *Pie Chart in Excel*. [online] Available at: http://www.excel-easy.com/examples/pie-chart.html [Accessed 17 Feb. 2016].
- 2. IELTS buddy, (2016). *IELTS Bar Chart Sample*. [online] Available at: http://www.ieltsbuddy.com/bar-chart.html [Accessed 17 Feb. 2016].
- 3. IELTS buddy, (2016). *IELTS Pie Chart - Lesson*. [online] Available at: http://www.ieltsbuddy.com/ielts-pie-chart.html [Accessed 17 Feb. 2016].
- 4. Mste.illinois.edu, (2016). *Line Graphs*. [online] Available at: http://mste.illinois.edu/courses/ci330ms/youtsey/lineinfo.html [Accessed 17 Feb. 2016].

References/Additional Reading List

- 5. Nku.edu, (2016). *INTERPRETING A HISTOGRAM*. [online] Available at: http://www.nku.edu/~statistics/212_Histogram_Example.htm [Accessed 17 Feb. 2016].

- 6. Pell, C. (2015). *Writing Task 1 Line Graph Sample Answer (US Consumption of Energy)*. [online] IELTS Advantage. Available at: http://ieltsadvantage.com/2015/04/07/writing-task-1-line-graph-sample-answer-us-consumption-of-energy/ [Accessed 17 Feb. 2016].

- 7. Uic.edu, (2016). *A Guide to Making Line Graphs Using Microsoft Excel for BIOS 100 Using aPC*. [online] Available at: http://www.uic.edu/classes/bios/bios100/labs/graphs01.htm [Accessed 17 Feb. 2016].