

Cumulative Frequency Graphs

1) A sample of 400 eggs is taken from each of two farms. The masses are found to be as follows:

Mass (g)	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 90
FARM A: No of eggs	13	48	82	155	88	14
FARM B: No of eggs	31	67	73	105	86	38

For each farm:

- Construct a cumulative frequency table
 - Draw a separate cumulative frequency graph
 - Find the median mass of the eggs
 - Find the interquartile range of the eggs.
- (e) In a sentence, say what your answers to (c) and (d) tell you about the eggs produced on the two farms.
- (f) How many eggs from Farm A had a mass of under 62g? What is the corresponding number for farm B?
- (g) A "large" egg has a mass greater than 77g. For each farm, find how many of the eggs were "large".
- (h) If you were going to buy eggs, packaged at random, direct from a farm, which of these two farms would you choose?

2) A survey of a firm's salaries reveals the following data:

Annual wage (1000)	8-10	10-15	15-20	20-25	25-30	30-60
No of employees	38	96	61	29	12	4

- Construct a cumulative frequency table.
- Draw a cumulative frequency graph.
- Find the median wage.
- Find the interquartile range of the wages
- The mean wage is £15717. Which gives a fairer picture of the "average" wage earned by the firm's employees – the mean or the median ?
- Use your graph to estimate how many employees earn under £9000.
- Use your graph to estimate how many employees earn over £27000.

3) The table below shows the age distribution of the population (in millions) of Great Britain. Draw a cumulative frequency graph, and use it to answer the following questions:

Age	0-	5-	10-	15-	20-	25-	35-	45-	55-	65-	75-	85-100
Pop	4.3	4.5	4.1	3.7	4.1	6.7	6.3	6.7	6.4	4.6	2.1	0.5

- Find the median age of people in Great Britain.
- Find the interquartile range of the ages.
- How many people are there over 60?
- What percentage of the population are under 18?
- How many of the population are of school age (ie aged 5 to 16)?

4) A firm sells 4 μ F capacitors in packets of 200. It is impossible to control the capacitance exactly, so the actual capacitance will actually vary around this "nominal" value. A packet was tested and the actual capacitance of each capacitor found. The results are summarised in the table below. Draw a cumulative frequency graph, and use it to answer the following questions:

Capacitance (μ F)	3.80-	3.85-	3.90-	3.95-	4.00-	4.05-	4.10-	4.15-4.20
Frequency	2	26	39	41	47	25	16	4

- Find the median and interquartile range.
- What is the probability that a capacitor chosen at random has a capacitance in the range 3.91 to 4.09F ?
- The firm wishes to include in its publicity a statement that: "90% of our 4 μ F capacitors have a capacitance between ___ and ___ μ F".
By excluding the top and bottom 5% of the range, fill in the blanks for them.