PROGRAMMING CHALLENGE 13: BAR CHART

The task is to input data for a frequency distribution and then output to the screen a horizontal bar chart.

The data is input as an X value followed by its frequency. Assume the frequency is always in the range 0 to 60 and there are no more than six X values.

The input shown below shows the number of sweatshirts sold in a retail shop over a one week period; for example there were 39 size XL items sold.

```
Next X value ... <ZZZ to END> XS
Frequency ... 12
Next X value ... <ZZZ to END> S
Frequency ... 22
Next X value ... <ZZZ to END> M
Frequency ... 45
Next X value ... <ZZZ to END> L
Frequency ... 56
Next X value ... <ZZZ to END> XL
Frequency ... 39
Next X value ... <ZZZ to END> XXL
Frequency ... 11
Next X value ... <ZZZ to END> ZZZ

+++++++++++++++++++++++++++++++++++++++
Frequency distribution
+++++++++++++++++++++++++++++++++++++++
  XS       @@@@@@@@@@@@
  S        @@@@@@@@@@@@@@@@@@@@@@
  M        @@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
  L        @@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
  XL       @@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
  XXL      @@@@@@@@@@@
```

Task 1

Write a program which inputs a set of X values and frequencies and produces output in the format shown.

Evidence 1:

Your program code for Task 1. [8]

Evidence 2:

A screenshot to confirm the dataset used and the output produced. [2]

The appearance of the bar chart display is to be improved as follows:

- Each bar is to be represented by more than one line of the same character so that its bar width is increased.
- Each bar will be shown with the same number of lines.
- The complete bar chart, including the heading, is to take up no more than 40 lines.
- The line width for the output is exactly 80 characters.
- Its appearance could be improved by changing the @ character.

Task 2

Write code to produce a new chart for the data used in Task 1 showing the maximum possible bar width and any other refinements you have introduced.

Evidence 3:

Your program code for Task 2. [4]

Evidence 4:

A screenshot showing the data entry followed by the bar chart. [2]

Some datasets will have a frequency which is greater than 60 and so the frequencies of the dataset can no longer be shown with a corresponding number of characters in the line. The frequencies will need to be scaled before the output is attempted.

The bar chart would benefit by the inclusion of a horizontal axis labelled with a scale showing the frequency values.

Task 3

Revise your program code to meet these new requirements.

Evidence 5:

Your program code for Task 3. [8]

Evidence 6:

Screenshots demonstrating:

- Dataset 1 as used in Task 1 which needs no scaling
- Dataset 2 of your choice to demonstrate frequencies which must be scaled
- Dataset 3 of your choice to demonstrate frequencies which must be scaled differently to Dataset 2. [6]