

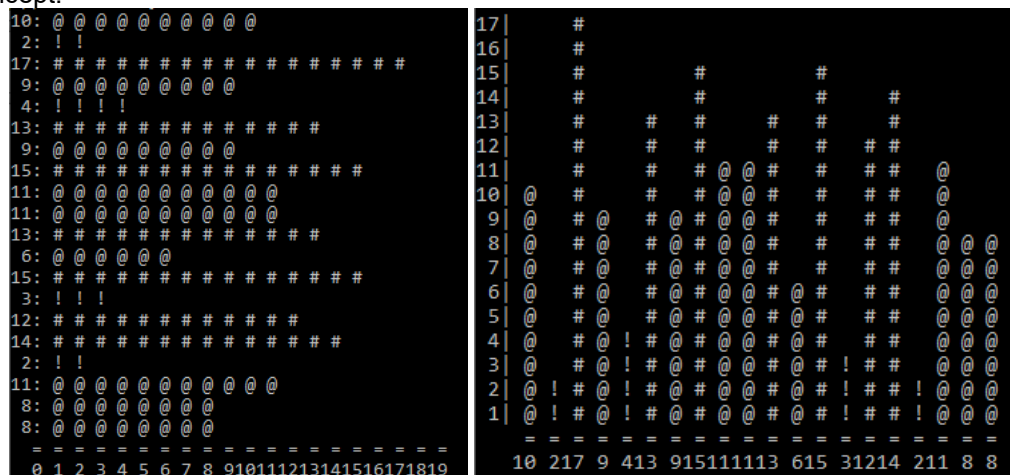
Practical 7 (due Thursday 2022-04-14 @ 09:00)

The purpose of this assignment is for you to use functions and libraries of functions as well as working with dynamic one-dimensional arrays.

Please note: Your code will be checked for originality. If you use someone else's code or code taken from the Internet then your prac will come under scrutiny for a potential copy, which may result in zero marks being awarded.

Required knowledge for the prac.

This prac refers to horizontal and vertical histograms. For the purposes of this prac a horizontal histogram uses bars that travel from left to right and a vertical histogram refers to a histogram with bars that travel from the bottom upwards. See the following diagrams that depicts this concept:



The diagram on the left is an example of a horizontal histogram. The one on the right is an example of a vertical histogram for the same data set.

Program

For this program you must make use of user defined libraries with functions defined and declared in the **HistogramSpace** namespace. The program **MUST** make use of a dynamic array. Solutions NOT making use of the dynamic array will be capped at 50%.

Write a C++ program that will accomplish each of the following requirements:

1. The number of items in the array must be specified from a command-line argument.
2. The program should make use of a menu system. Each menu option can roughly be mapped to the rest of the requirements in this list.
3. The user must have the ability to initiate a process in the program to reset the value of each array item to zero.
4. The user must allow the program to fill an array with random whole numbers in between a lower bound number and upper bound number provided by the user. The programmer must ensure the upper bound random number are within a range decided by the programmer.
5. The user must have an option that will force the program to output a horizontal histogram of the array values.
6. The user must have an option that will force the program to output a vertical histogram of values in the array.
7. The program should run until the user specifically chooses to quit the program.
8. The histogram bars must use three different characters, depending on range of values in the histogram.
 - a. Bars that indicate values in the bottom third must use a '!' character.
 - b. Bars that indicate values in the middle third must use a '@' character.



- c. Bars that indicate values in the top third must use a '#' character.

Design

The design should cover the output of the horizontal histogram. Make sure to save your design as a PDF document.

Please format your practical for submission according to the structure established in the previous practical (Docs directory containing design, Source directory containing *.cpp files). The submission archive must be named according to the convention established in the previous practicals.

Please note: Programs that do not compile will be capped at 40%

Mark sheet		
	Using the correct namespace	5
	Declaring functions in both header and implementation file	5
	Initialise array with zero values	5
	Calculating a random number between two values	10
	Using command line argument for number of random numbers	10
	Initialise array with random numbers	5
	Output horizontal histogram	10
	Output vertical histogram	15
	Histogram bars are clearly differentiated into three categories	15
	Using a menu to provide options for the user	10
	Design	10
		/100