Submission Date
Milestone 1 : 30 Aug 2019, Mon, noon

Individual Assignment
This is an individual assignment. STRICTLY NO COPYING from other sources except codes given in this course. If detected all parties involved will get 0 marks.

Assignment - Milestone 1
Implement a program which will manage a display board which is made up of forty display dots (horizontal) by twenty display dots (vertical) as shown in Fig. 1. The display board supports the character set of {A, B, C, ... Z} and {0, 1, 2, ... 9}.

Fig. 1: The display board.

At the beginning of the program, the user will be asked to input a character string of up to twenty five character long and the co-ordinates of the anchor dot of the string. The anchor dot is the top left dot of the string. Fig.2 shows an example of the anchor dot for the string "ABC DEF".
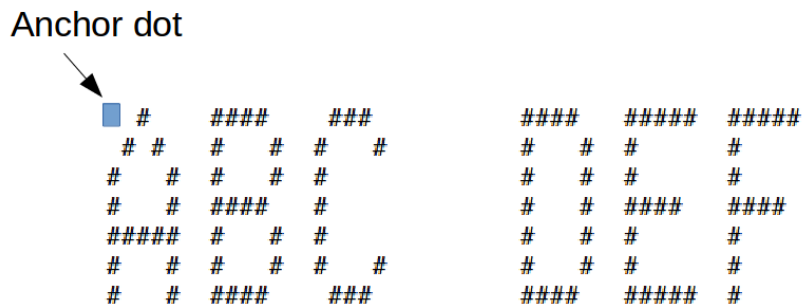

Fig. 2: The anchor dot of a string.

After that the user will be given a choice of whether to display the string scrolling from left to right, from right to left, upwards, downwards or stationary without scrolling.

If scrolling pushes the string beyond the edges of the board, the part of the string pushed out will enter from the opposite edges, showing a wrap around effect. In Milestone 1, this wrap-around effect needs not be implemented when a string scrolls from left to right or from right to left.

Next, the user will specify how many time steps to display the character string. One time step is one refresh cycle which is made up of a screen clearing process and a display process. The speed of a refresh cycle will be specified by the user with a number from 1 to 10, 1 being the slowest and 10 being the fastest.

The example below shows a string "ABC DEF" being displayed at origin dot (0, 19) and scrolling upwards for three time steps.
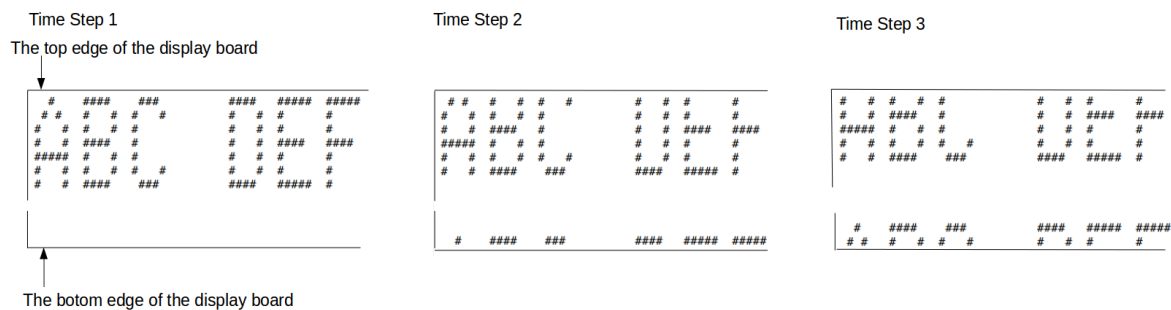

Fig. 3: Scrolling a string upwards

You can use the following design as a reference to design the display maps of the characters supported by the display board. You can also design your own display map if you wish to but extra marks will not be awarded for your design in this milestone.

Fig. 4: Display map of supported characters.

Use only platform-independent standard C++ libraries to implement this milestone. However, the use of `system("clear")` or `system("cls")`, if needed, is permitted.

To facilitate marking on different platforms, put your clear screen code in one function and call the function to clear the screen. In this way, your clear screen code only needs to be changed at one spot to make it work on a different platform when marking.

To ease plagiarism checking, put your source code in only one file and use the following file name format: `yourLabSecion.StudentID.NameInTheMMUNameList.cpp`
For example, name your source file as `TT01.1171777777.Tony.Gaddis.cpp`.
0.5 mark will be deducted from a submission which does not follow this format.

Hint for one way of implementation : Use a 2D character array as an abstraction of the display board. The size of the 2D array can be bigger than 20 by 80 to store dots to be displayed at later time steps.

Deliverables
a) Source code in one file (For example `TC01.1171777777.Tony.Gaddis.cpp`).
b) Design documents such as flowcharts, pseudo codes in PDF format to explain your work. This is optional.
c) Screen-shots of your program running compiled into a document in PDF format.

Additional Info on Deliverables
a) Source codes have to be properly formatted and documented with comments and operation contracts. Executable files need not be submitted.

b) For ALL your .cpp and .h files, insert the following information at the top of the file:

```
/**********|**********|**********|
Program: YOUR_FILENAME.cpp / YOUR_FILENAME.h
Course: Data Structures and Algorithms
Year: 2010/11 Trimester 1
Name: Frank Carrano
ID: 1071001234
Lecture Section: TC101
```

```
Tutorial Section: TC201
Email: abc123@yourmail.com
Phone: 018-1234567
**********|**********|**********/
```

Soft-copy submission instruction

a) Create a folder in the following format:

TUTORIALSECTION_ASSIGNMENT_FULLNAME

For example, if your name is Frank Carrano, you come from TC201 tutorial section, and you are submitting Milestone 1, then your folder name should be "TC201_M1_FRANK_CARRANO" without the double quotes.

b) Place all files for submission into the folder.

c) Zip your folder to create a zip (TC201_A1_FRANK_CARRANO.zip) archive. Remember that for Milestone 2, your zip archive filename should be "TC201_M2_FRANK_CARRANO.zip".

d) Submit your assignment through MMLS.

Evaluation Criteria

Mark Sheet

Criteria	Max	Actual Marks
Milestone 1		
User interface	1	
Stationary display of a string	1	
Scrolling features (0.5 mark for each direction)	2	
Variable speed from 1 to 10	0.5	
Documentation	0.5	
Total	5	

Each feature will be evaluated based on fulfilment of requirements, correctness, compilation without warnings and errors, error free during runtime, basic error handling, quality of comments and operation contracts, user friendliness, and good coding format and style.