

ESc101N: Fundamentals of computing(Lab Session 7)

September 17, 2009

Instructions

1. Please read the question carefully and write the program accordingly
2. Make sure that the TA has graded you program
3. The marks are distributed as follows. You get 60% of the marks if the basic algorithm is current, 20% if you manage to compile and execute and 20% for writing the code cleanly, i.e. using proper variable names, intending and making the code more readable.

Question 1. (10 marks) Given a sequence of integers $\{a_1, \dots, a_n\}$ positive or negative, a *bar graph* is a sequence of n

columns containing there possible characters, '#', '-' and space, satisfying the following condition

- All the '-' are in the same line (row). This denotes the x -axis.
- If a_i is positive then there are a_i many '#' above the '-' line and if a_i is negative then there are $|a_i|$ many '#' characters below the '-' character.
- All the other characters are spaces.

Write a program that will read n numbers from the user and prints its vertical bar graph.

Hint: Print stuff line by line. The j -th th character of the i -th line is either a '#' or a space character. Question is when is it '#' and when is it a space.

```
$ ./a.out
enter the sequence length: 10
enter a[0]: 3
enter a[1]: 4
enter a[2]: -4
enter a[3]: 9
enter a[4]: 0
enter a[5]: 3
enter a[6]: 2
enter a[7]: -6
enter a[8]: -9
enter a[9]: 1
the bar chart is
```

```

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# #
## # #
## # ##
## # ## #
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#  ##
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#  #
#  #
$
```

Question 2. (0 marks) Plot your favourite mathematical function this way. For example to plot sine function. Choose the integer value of $a \sin(x)$ where a is the number of lines in your terminal (type `echo $LINES`) to print this.

You need to include the math library for accessing the sine function. Also you need to compile the program with the `-lm` option. i.e.

```
$ gcc foo.c -lm .
```