cisc1110, fall 2010, assignment for unit III

This is the assignment for unit III, "more data types". You are expected to complete the assignment in the C++ language and submit your ".cpp" files. You must complete and submit the assignment on or before the due date of **October 5**. This assignment is worth **4 points**.

NOTE THE NEW LATE POLICY WHICH GOES INTO EFFECT WITH THIS ASSIGNMENT! Assignments will NOT be accepted more than 7 days late. See the class web page for details.

Submission instructions:

- Submit your assignment to me via email: `sklar@sci.brooklyn.cuny.edu`
- Your email subject line should be: **CISC 1110 Lab III submission**
- Attach your C++ (**song.cpp**) file to your email.
- Make sure your name is in the body of the email message.
- Make sure your name is also included in the header comments at the top of your C++ file.

For this assignment, you will create a program called **song.cpp**. There are **5 steps**, described below, that you should follow in order to develop your program. Make sure that for each step, you compile, run and test your program to make sure it works as described in the instructions for that step. You should make copies of the program along the way, after each step, so that you save the progress you make in your work—in case of disaster or you need to backtrack to a previous step that worked.

step 1 (1 point)

- Create a new program file named **song.cpp**.
- Declare a variable that is an **array** of **string**s, and initialize the value of the array to the lyrics from a song that you like. Each line of the song should be a separate element in the array, like the example we did in class on September 23 (see page 16 of the lecture notes).
  You don't need to enter the whole song. One stanza (approx 4 lines) is fine.
- Declare an integer **constant** that defines the number of lines in your song.
- Using a **for** loop and your **constant**, output each line of the song on a line by itself.
- Compile, run and test your program. Go back and fix it if it doesn't work properly.

step 2 (1 point)

- Modify your program as follows.
- Compute and output the following statistics on your song:
  — the number of letters in each line of the song
  — the total number of letters in the song
  — the total number of lines in the song *(hint: you don't need to compute this; just output the number)*
  — the average number of letters per line in the song *(this should be a floating point number!)*
- Compile, run and test your program. Go back and fix it if it doesn't work properly.

step 3 (1 point)

- Modify your program as follows.
- Define a **int** and set its value to a random number between 97 and 122.
- Define a **char** variable whose ASCII code is the random number you just selected. For example, if the random number that I chose was 99, then my **char** variable would have the value `'c'`.
  Hint: use the `(char)` conversion function to convert from the `int` to the ASCII character.
- Use the string `find()` function to search for your **char** value in each line of your song and output the position of the first occurrence of the character in each line. Note that if the character is not in the line, then `find()` will return `-1`. That's okay.
- Compile, run and test your program. Go back and fix it if it doesn't work properly.

step 4 (1 point)

- Modify your program as follows.
- Use the string `replace()` function to put an exclamation point (`!`) at the end of each line of your song.
- Then output the new version of the song.
- Compile, run and test your program. Go back and fix it if it doesn't work properly.

sample output

Below is sample output from my solution to the assignment:

```
step 1. here is my song:
   line 0: Last night I had the strangest dream
   line 1: I ever dreamed before
   line 2: I dreamed the world had all agreed
   line 3: To put an end to war

step 2. here are some statistics on my song:
   number of letters on line 0 = 36
   number of letters on line 1 = 21
   number of letters on line 2 = 34
   number of letters on line 3 = 20
The total number of lines in my song is: 4
The total number of letters in my song is: 111
The average number of letters per line is: 27.75

step 3. my randomly chosen letter is: w
   the first occurence of the letter w in line 0 is at position -1
   the first occurence of the letter w in line 1 is at position -1
   the first occurence of the letter w in line 2 is at position 14
   the first occurence of the letter w in line 3 is at position 17

step 4. here is my modified song:
   Last night I had the strangest dream!
   I ever dreamed before!
   I dreamed the world had all agreed!
   To put an end to war!
```