Programming Fundamentals

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Assignment #8 - Rainbow Road

Mario Kart is perhaps the most popular racing game in the world. Developed by Nintendo, the Mario Kart series has sold over 166.41 million copies as of March 2022. Rainbow Road is one of the most infamous stages in the game because of how fun yet frustrating it can be. Don't worry though, I'm not asking you to build a racing game in C++ (not yet anyway). Instead, I'm hoping to see some of its incredibly vibrant color palette in your output. Read through the whole assignment carefully and implement the following functions:

- TakeInput(*Parameters*)
  Populate a character array sent from the main function with any message. Assume no message will be longer than 1000 characters.
- UniqueCounter(*Parameters*)
  This function will take your message as a parameter along with at least one more char array. **Populate** the char array with all the unique characters in your message. <u>HEADS UP!</u> Uppercase and lowercase alphabets must be treated the same. Treat 't' the same as 'T'. The space character doesn't count as a character either.
  Print those unique characters. Finally, this function should **return** the total number of unique characters in your input.
- CharDictionary(*Parameters*)
  This function will **print** the number of times each unique character occurs in the message. Print both the unique characters as well as their corresponding count.
- ShowMeTheRainbow(*Parameters*)
  First, this will **print your message in color**! For all characters in your message, fetch a result from RainbowNumber(next function). The table highlights what color you must paint the character depending on what value RainbowNumber() returns.
  Additionally, the function will be passed the last 4 digits of your roll number in the form of a <u>character array</u> as a parameter. Convert your roll number from a character array to an integer (NOT integer array). **If your roll number is even**, also print only the non-prime indices of your message in Cyan. **If it is odd**, instead also print all prime indices in Magenta. Keep in mind these are foreground colors, not background colors. This is not Red, this is Red.

- **RainbowNumber(*Parameters*)**
  If the character in your message occurs
    - 1 time, return 0.   2-3 times, return 1.
    - 4-5 times, return 2.   6-7 times return 3.
    - 8+ Times, return 4.

Color	Red	Green	Blue	Purple	Yellow
RainbowNumber	0	1	2	3	4

Sample Input: `Mario? Issa Luigi!`
Sample Output: `Mario? Issa Luigi!`

That's all for the assignment. Keep in mind, and this is also a potential hint, these functions may do more than just fulfill the description requirements. These functions may also take additional parameters than the ones listed explicitly. In fact, it is wise that you decide what additional parameters may feed into the functions to achieve the goals of the program. Nevertheless, whatever parameters are listed explicitly must be passed through the function. You may email the TA with any reasonable questions, but you must figure out how to print in color yourself. Learning how to Google efficiently is part of this assignment. **Hint**: Maybe if you include the colors Magenta & Cyan in your query, you'll find something useful.

VERY IMPORTANT P.S: Coloring outputs may or may not be a feature in macOS C++ IDEs; HOWEVER, you must use a Windows PC (visit the university lab) to complete that specific task and have your assignment evaluated on a Windows Machine if you only own a Mac. You will be interacting with software exclusive to Windows extensively throughout your degree so you cannot opt out of this functionality just because you own a Mac. Every other function can be completed on macOS just fine. "22L-1234.cpp" is the only acceptable roll number format for this assignment. No underscores instead of the hyphen, not "main.cpp" and no other iterations. Failure to do will result in a flat 50% penalty. Late submissions will be penalized exponentially. All other guidelines for assignment submissions, including plagiarism, also apply.

Rainbow Road from Mario Kart 64