ENGG1340 Computer Programming II
Quiz 1
Mar 24th, 2020

Time Allowed: 60 minutes for doing the Quiz Q1-10; submit the video link within 60 mins to Moodle after the quiz

Max 11 marks (Total 10 marks for the quiz, extra one mark for submitting a video link to explain the idea of doing Q10)

For Q1-Q10, please finish them in the Quiz section on Moodle (Note: Q10 is a VPL question and please make sure your file is in .cpp format). You are requested to have a 1-min video recording to explain your idea (i.e. how did you limit the number of multiplication/division operations to n?) for doing question 10. Refer to "Video Record Guideline" in Moodle for details.

Q.1   (0.5%) In Linux/Unix, the _____ command is used to list contents of directories?
   A.   `folder`
   B.   `ls`
   C.   `ld`
   D.   `grep`   Answer: _____B_____

Q.2   (0.5%) In Linux/Unix, the _____ command(s) can be used to remove directories?
   A.   `rm -r`
   B.   `rmdir`
   C.   `rmdir` and `del`
   D.   `rmdir` and `rm -r`   Answer: _____D_____

Q.3   (0.5%) In Linux/Unix, how to rename a file "`A.txt`" to "`B.txt`"?
   A.   `rn B.txt A.txt`
   B.   `mv B.txt A.txt`
   C.   `rn A.txt B.txt`
   D.   `mv A.txt B.txt`   Answer: _____D_____

Q.4   (0.5%) Write at least three commands or editors that allow you to show the content of a file in Linux/Unix.

      Answer: _____cat, more, less, vi, emacs, gedit, nano
      _____

Q.5   (1%) Finish this task using a combined command (a.k.a. piping) using four individual commands. *Task*: Find all lines containing the keyword "`was`" from file

"opening_lines.txt" and sort the lines alphabetically. Pick the first five of the sorted lines and count how many characters are in the five lines.

Answer: _____grep was opening_lines.txt | sort | head -n5 | wc -c
_____

Q.6 (0.5%) Which type of error is caused when you mistype something in C/C++ programming?
   A. Runtime error
   B. Logic error
   C. Browser error
   D. Syntax error   Answer: _____D_____

Q.7 (0.5%) 'cout' is?
   A. a Class
   B. an Object
   C. a Package
   D. a Namespace   Answer: _____B_____

Q.8 (1%) What will i and j equal after the code below is executed?

```
int i = 0;
unsigned int j = i--;
```

Answer: _____i=-1 , j=0
_____

Q.9 (1%) How many rows of "aha" will be printed?

```
unsigned char halfLimit = 150;

for (unsigned char i = 0; i < 2 * halfLimit; ++i)
{
    cout << "aha\n";
}
```

Answer: _____Infinite loop, printing infinite lines if not killed.

Q.10 (4%) Fill in the body of the function below. The function will return the Combination $C(n,r)$ of two integer inputs n and r, $n \geq r \geq 0$, where $C(n,r) = \frac{n!}{r! \times (n-r)!}$ and $i! = 1 \times 2 \times 3 \times ... \times i$ is the factorial of i.

NOTE: Your function can make use of no more than n times of multiplication / division in the calculation.

After you have implemented the function correctly, the following function calls
f1(12, 4)
f1(20, 3)

will return the values 495 and 1140, respectively.

```cpp
#include <iostream>

using namespace std;

int f1(int n, int r) {
      unsigned long int numerator = 1;
      unsigned long int denominator_1;
      int denominator_2;
      for(int i=2; i <= n; ++i) {
            numerator *= i;

            if (i==r) {
                denominator_2=numerator;

            }


            if(i == (n-r)) {
                denominator_1 = numerator;

            }
      }

      return (numerator) / (denominator_2*denominator_1);
}


int main()
{
    int n,r;
    cin>>n;
    cin>>r;
    cout<<f1(n,r)<<endl;

}
```