

FPU Fall 2020 - COP 3337C Homework-1

Due Date & Time: 9/24/2020 – 11.59pm through CANVAS.

Total Marks: 10 marks.

Weight in final Grade: 4%

Part- 1: Carry 5 marks.

Create one .cpp file for the following program and upload it to as a 1st file under homework-1 in the Canvas. Use Your First Name + Your Last Name + Part-1 + HW1. For example, **Bayazit_Karaman_Part1_HW1.cpp**. In the comment, at the very beginning of the source file (e.g. cpp file), you should put your full name, and the date of last successful debugging/ compiling).

Program : Write a complete C++ program that at least consists of the *main()* function and a recursive function *gcd()* with return value.

- 1) Define function *gcd()* with two and only two parameters that calculates the greatest common divider of two given parameters. Hint: use the difference between two parameters or the remainder obtained using one parameter divide the other.
- 2) In *main()*
 - a) Read 2 positive integers with proper prompt.
 - b) Call *gcd()* with proper syntax.
 - c) Display the result, i.e. the greatest common divider of two input integers, with proper prompt.

Note: *gcd()* must be a recursive function with a return value.

Part- 2: Carry 5 marks.

Create one .cpp file for the following program and upload it to as a 2nd file under homework-1 in the Canvas. Use Your First Name + Your Last Name + Part-2 + HW1. For example, **Bayazit_Karaman_Part2_HW1.cpp**. In the comment, at the very beginning of the source file (e.g. cpp file), you should put your full name, and the date of last successful debugging/ compiling).

Program: Write a complete C++ program that is made of functions *main()* and *rShift()*. The *rShift()* function must be a function without return with 6 parameters. *rShift()* should do followings:

- 1) Shift the first 4 formal parameters' value one place to right circularly and send the updated values out to the caller function, i.e. *main*. Furthermore, after calling this function with first 4 actual parameters, say *a1*, *a2*, *a3*, *a4*, and these actual parameters should shift their value one place to right circularly as well. That is, *a1* takes *a2*'s value, *a2* takes *a3*'s value, *a3* takes *a4*'s value, and *a4* takes *a1*'s value.
- 2) Assuming that first 4 formal parameters of *rShift* are *n1*, *n2*, *n3*, and *n4*, *rShift* should calculate maximum and average of *n1*, *n2*, *n3*, and *n4*, and send results back to caller function, i.e. *main*.

The *main()* function should do followings:

- 1) Read four integers from the user with proper prompt and save them to four local variables.
- 2) Call the *rShift()* function with 6 actual parameters.
- 3) Receive all results, i.e. four shifted integers, plus maximum and average from *rShift()*. Then print these numbers with proper prompt text.

Note:

- No input and output with the user inside *rShift()* function. All input and output should be strictly limited inside *main()* function.
- Both statistics must be calculated with basic C++ flow control statements, and cannot be implemented by calling library functions such as *max()*.