

# CSE102 – Computer Programming (Spring 2021)

## Homework #4

**Handed out:** March 24, 2021.

**Due:** 11:55pm April 6, 2021.

**Hand-in Policy:** Via Moodle. No late submissions will be accepted. A student with number 20180000001 should hand in 20180000001.c for this homework.

**Collaboration Policy:** No collaboration is permitted.

**Grading:** This homework will be graded on the scale of 100.

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**Homework Description:** You will write a C file with the main function with three additional functions described below. Your program will start calling part 1, part 2 and part 3 functions in that order. For each part, you will receive the inputs from the user and print the output to the console. Details of the parts are further discussed below. Please pay attention to the output format. Any deviation from the shared format may be penalized regardless of the correct execution.

**Part 1.** Your function will read **X** floats as coefficients of an **Nth** order polynomial from the command prompt and writes the polynomial in a pretty format. No sign replications should be allowed. "0" can be entered as input, but it should not be shown in the output.

$$p(x) = a_n x^n + a_{n-1} x^{n-1} + \dots + a_1 x + a_0$$

**Example 1:**

Enter your polynomial [n a\_n a\_{n-1} a\_{n-2} ... a\_0]: 2 1 -3 -4

$$p(x) = x^2 - 3x - 4$$

**Example 2:**

Enter your polynomial [n a\_n a\_{n-1} a\_{n-2} ... a\_0]: 3 1 0 1 2

$$p(x) = x^3 + x + 2$$

**Part 2.**

**Armstrong number** is a number that is equal to the sum of cubes of its digits. For example 0, 1, 153, 370, 371 and 407 are the Armstrong numbers.

$$153 = (1*1*1) + (5*5*5) + (3*3*3)$$

$$(1*1*1) = 1 - (5*5*5) = 125 - (3*3*3) = 27$$

$$\text{So: } 1 + 125 + 27 = 153$$

**Palindrome number** is a number that is same after reverse. For example 121, 34543, 343, 131, 48984 are the palindrome numbers.

Your function will read an integer from the command prompt and check if that integer is a palindrome number or an armstrong number or both.

**Example 1:**

Please enter an integer number : 370

Output > This number is only Armstrong number.

**Example 2:**

Please enter an integer number : 343

Output > This number is only Palindrome number.

**Example 3:**

Please enter an integer number : ???

Output > This number is both Palindrome and Armstrong number.

**Example 4:**

Please enter an integer number : 159

Output > This number does not satisfy any special cases

**Part 3.** Your function will read 2 integers from the command prompt, find the prime numbers between these integers and print their sum on the screen.

**Example 1:**

Please enter first integer number : 26

Please enter second integer number : 58

Output > Sum of prime numbers between 26 and 58 : 281

**Example 2:**

Please enter first integer number : 17

Please enter second integer number : 91

Output > Sum of prime numbers between 17 and 91 : 905

**General Rules:**

1. Obey and do not break the function prototypes that are shown on each part, otherwise, you will get zero from the related part.
2. The program must be developed on Linux based OS and must be compiled with GCC compiler, any problem which rises due to using another OS or compiler won't be tolerated.
3. Note that if any part of your program is not working as expected, then you can get zero from the related part, even it's working in some way.
4. You can ask any question about the homework by using the forum in the Teams page of the course.