

Final Exam

Course: Introduction to Programming

Duration: 120 minutes

You could use any materials or search for information on the internet.

You need to self-organize to submit on time (before 11:15 PM). Late submissions is getting penalty points.

Turn in your answer files (.c and .py files) on GG classroom when you are done.

Then, send your answer files to the email 30421001@student.vgu.edu.vn (Khoa Tho Anh Nguyen) and CC to me via vinh.dq2@vgu.edu.vn. Email title is as CSE2021_ID_FirstName, where ID and FirstName are your student ID and first name, respectively.

After that, please wait for a few minutes for my confirmation from GG classroom. When you get a reply from GG classroom, you can leave Zoom or GG Meet. Please do not reply again. Time of submission will be updated when you reply again.

Note: For all questions, you can pass extra parameters for your functions as many as you want. You are required to implement each question in both C and Python.

Question 1)(Basic Skill): Implement the function as follow:

$$f(x) = \frac{x^2}{2} * (1 + x^2 + 0.1 * x^3)$$

Example 1: $f(0.5) \approx 0.1578125$

Example 2: $f(1.5) \approx 4.0359375$

Question 2)(Array/List and Loop) Given an array in C (or a list in python), write functions to compute the sum of elements of even indices.

$$\mathbf{X} = [x_1 \quad \dots \quad x_n]$$

Example 1:

$\mathbf{X} = [2 \quad 6 \quad 3 \quad 8 \quad 6 \quad 3]$ result is sum of of elements of even indices: res = 11

Example 2:

$\mathbf{X} = [1 \quad 2 \quad 5 \quad 3 \quad 1 \quad 5 \quad 1]$ result is sum of of elements of even indices: res = 8

Question 3) Implement the function which receives **min_value**, **max_value** and an **array**. If an element is less than the min_value, it is replaced by 0. If an element is greater than the max_value, it is replaced by 1.

Example 1:

input: min_value = 3, max_value=6, $\mathbf{x} = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

result: $\mathbf{x} = \{0, 0, 3, 4, 5, 6, 1, 1, 1\}$

Example 2:

input: min_value = 11, max_value=33, $\mathbf{x} = \{4, 12, 23, 4, 35, 16, 7, 48, 19\}$

result: $\mathbf{x} = \{0, 12, 23, 0, 1, 16, 0, 1, 19\}$

END