

Practice Test

(Questions from last year's 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 your answer files (.py files) on GG classroom before 4:00 PM. Late submissions is getting penalty points.

Note: For all questions, you can pass extra parameters for your functions as many as you want.

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

$$f(x) = 1 + 2x + x^2$$

Example 1: $f(1.0) \approx 4.0$

Example 2: $f(2.0) \approx 9.0$

Question 3)(List and Loop) Given a list in python, write a function to compute the sum of elements of even indices.

$$\mathbf{X} = \begin{bmatrix} x_1 & \dots & x_n \end{bmatrix}$$

Example 1:

$$\mathbf{X} = \begin{bmatrix} 2 & 6 & 3 & 8 & 6 & 3 \end{bmatrix} \text{ result is sum of elements of even indices: res} = 11$$

Example 2:

$$\mathbf{X} = \begin{bmatrix} 1 & 2 & 5 & 3 & 1 & 5 & 1 \end{bmatrix} \text{ result is sum of elements of even indices: res} = 8$$

Question 4)(List and Loop) Write a function to square all the elements of a list $\mathbf{X} = \begin{bmatrix} x_1 & \dots & x_n \end{bmatrix}$

Example 1:

$\mathbf{X} = \begin{bmatrix} 2 & 1 & 3 \end{bmatrix}$ result is $\mathbf{X} = \begin{bmatrix} 4 & 1 & 9 \end{bmatrix}$

Example 2:

$\mathbf{X} = \begin{bmatrix} 2 & 2 & 5 \end{bmatrix}$ result is $\mathbf{X} = \begin{bmatrix} 4 & 4 & 25 \end{bmatrix}$

Question 5) Implement the function which receives **min_value**, **max_value** and a **list**. 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