ASSIGNMENT #1

SUBJECT & BASIC INFORMATION

➡ Write down the algorithm and draw the flowchart of the program which calculates the integral of $\boldsymbol{f(x) = x^2}$ using the "Reiman Sums" formula above.

- Values of ***a***,***b***, and ***n*** will be entered from the keyboard

"Reiman Sums" Formula of Interval Calculation between the interval $[a, b]$:

$\int_a^b f(x) \cong h * \sum_{i=1}^{n} f(\varepsilon_i)$

- $n \Rightarrow$ number of intervals
- $h \Rightarrow$ interval step value between $[a, b] \Rightarrow h = \frac{b-a}{n}$
- $\varepsilon \Rightarrow$ midpoints of two interval steps, first step is x_0, next step is x_1, and ith step is x_i, $x_0 = a$, $x_i = x_{i-1} + h$ and $\varepsilon_i = \frac{2x_i+h}{2}$

➡ **TWO SAMPLE SCREEN OUTPUT FOR THE REQUESTED PROGRAM**

```
a  : 0
b  : 10
n  : 5
h = 2
---------------------------------------
x0                      : 0
epsilon                 : 1
interval value          : 1
---------------------------------------
x1                      : 2
epsilon                 : 3
interval value          : 9
---------------------------------------
x2                      : 4
epsilon                 : 5
interval value          : 25
---------------------------------------
x3                      : 6
epsilon                 : 7
interval value          : 49
---------------------------------------
x4                      : 8
epsilon                 : 9
interval value          : 81
---------------------------------------
INTEGRAL                : 330
```

```
a  : 0
b  : 5
n  : 5
h = 1
---------------------------------------
x0                      : 0
epsilon                 : 0.5
interval value          : 0.25
---------------------------------------
x1                      : 1
epsilon                 : 1.5
interval value          : 2.25
---------------------------------------
x2                      : 2
epsilon                 : 2.5
interval value          : 6.25
---------------------------------------
x3                      : 3
epsilon                 : 3.5
interval value          : 12.25
---------------------------------------
x4                      : 4
epsilon                 : 4.5
interval value          : 20.25
---------------------------------------
INTEGRAL                : 41.25
```

RULES & EVALUATION

- **Deadline:** Control SABIS system
- A report should be prepared for each assignment
  - First page of the report should be a cover page including student information (name, surname, number), lecturer, course name, ...
  - The content of the assignment (writing down the algorithm/pseudocode, drawing the flow diagram) should be included after the cover page
  - At each paper of the report, there should be student's **name, surname** information**, a 'honor code'** and **sign**.
- Assignments will be uploaded to SABIS before deadline.
- Assignments should be submitted in **'pdf'** format.