ASSIGNMENT #2

SUBJECT & BASIC INFORMATION

- Write down C++ program which calculates the integral of $\boldsymbol{f(x) = x^2}$ using the "Reiman Sums" formula below.
  - 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

- Using a **goto** statement is strictly prohibited.
- Each C++ file should include this comment lines below at the beginning of the C++ file

```
// ********************************************************************************
// ******              STUDENT NAME :                                        *****
// *****             STUDENT NUMBER :                                       *****
// *****               ASSIGNMENT # :                                       *****
// *****                   - HONOR CODE -                                   *****
// ********************************************************************************
```

- You should compile your codes with **Microsoft Visual Studio 2022**. (NOTE: If you use another compiler, please test your codes with this compiler before uploading your homework on system)
- **Deadline:** Control SABIS system
- You should upload only your C++ file (.cpp file) together before deadline.
- Evaluation Criteria
  - Comment lines (student information, explaining operations like variable names, if statements, loops, etc.)
  - Obeying the variable declaration rules
  - Being readable (intendation, comments, etc.)
  - Correct compilation of the code
  - …