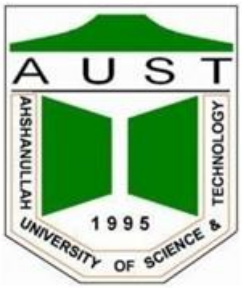

AHSANULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT
OF
ELECTRICAL AND ELECTRONIC ENGINEERING

LAB REPORT

COURSE NO	: EEE 2226
COURSE NAME	: Numerical Technique Laboratory
EXPERIMENT NO	: 02
DATE OF SUBMISSION	: 14/07/2025

Submitted by :

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Year	: 2nd
Semester	: 2nd
Section	: D(2)

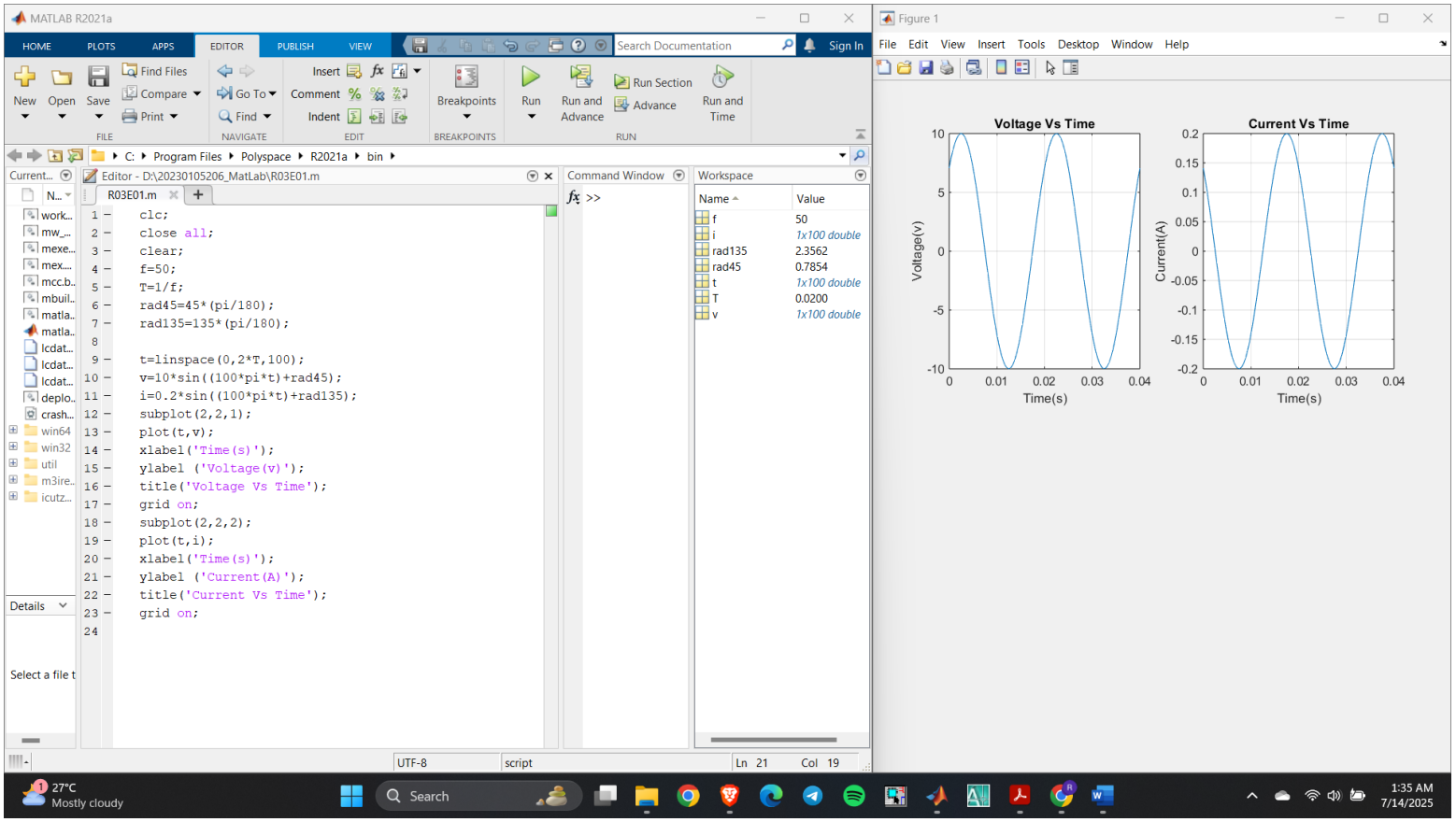
Exercise 1.

Plot the following two sinusoidal signals (for two cycles) in the same figure window but in different subplots:

(i) Plot v vs. t for: $v = 10\sin(100\pi t + 45°)$

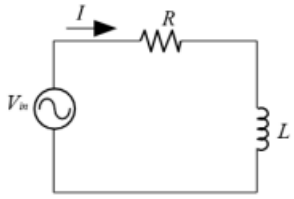
(i) Plot i vs. t for: $i = 0.2\sin(100\pi t + 135°)$

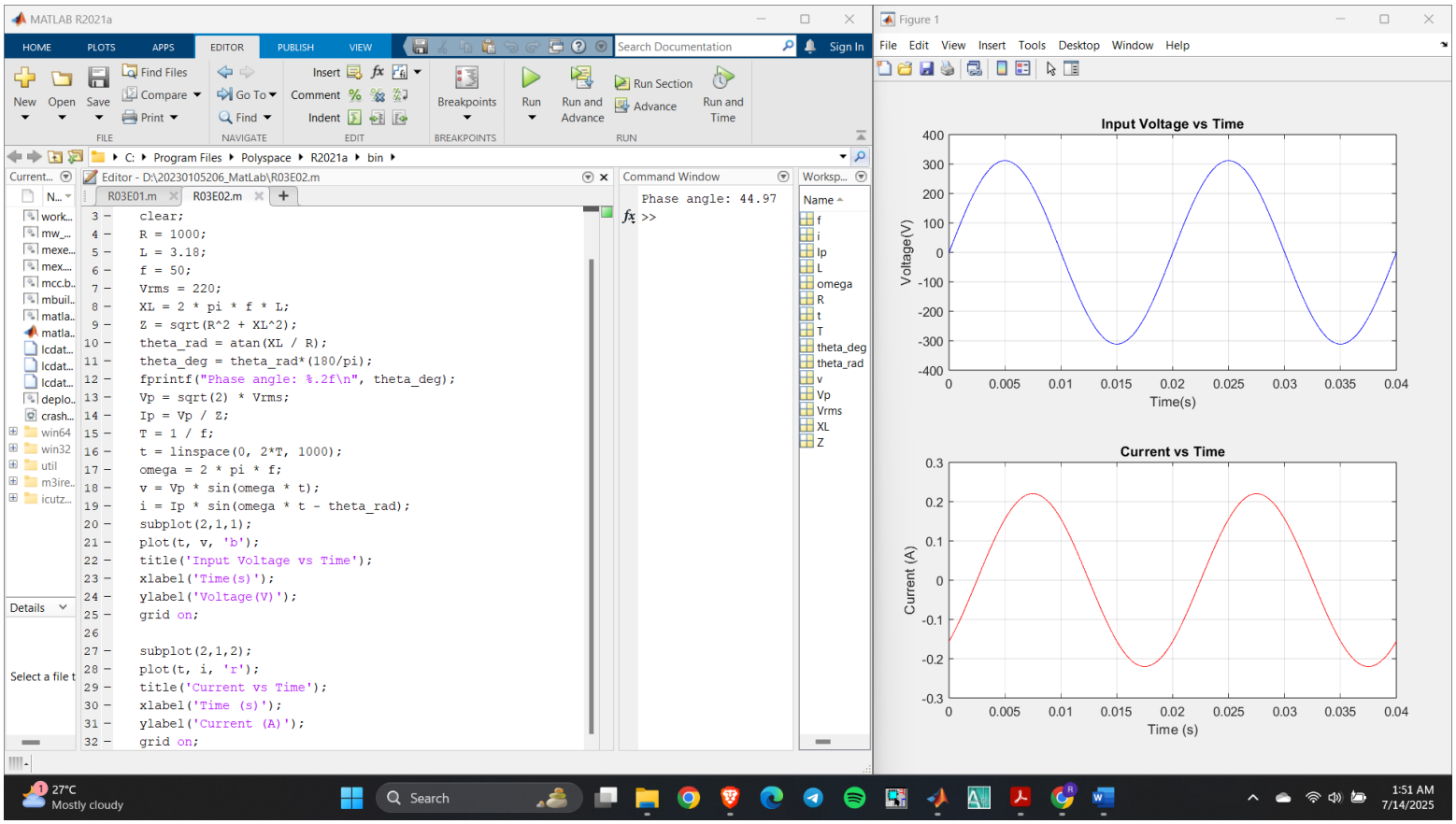
Also properly label the axis.



Exercise 2.

Consider the following RL circuit, where the value of resistor, $R = 1k\Omega$ and the value of the inductor, $L = 3.18\ Henry$. Also, the input voltage is 220V (rms) AC sinusoidal signal with a frequency of 50 Hz. If you calculate the phase angle difference between input voltage, Vin and the series current, I as shown in the following figure, you will find that the current should lag the input voltage by 45° for the given values of f, R and L.

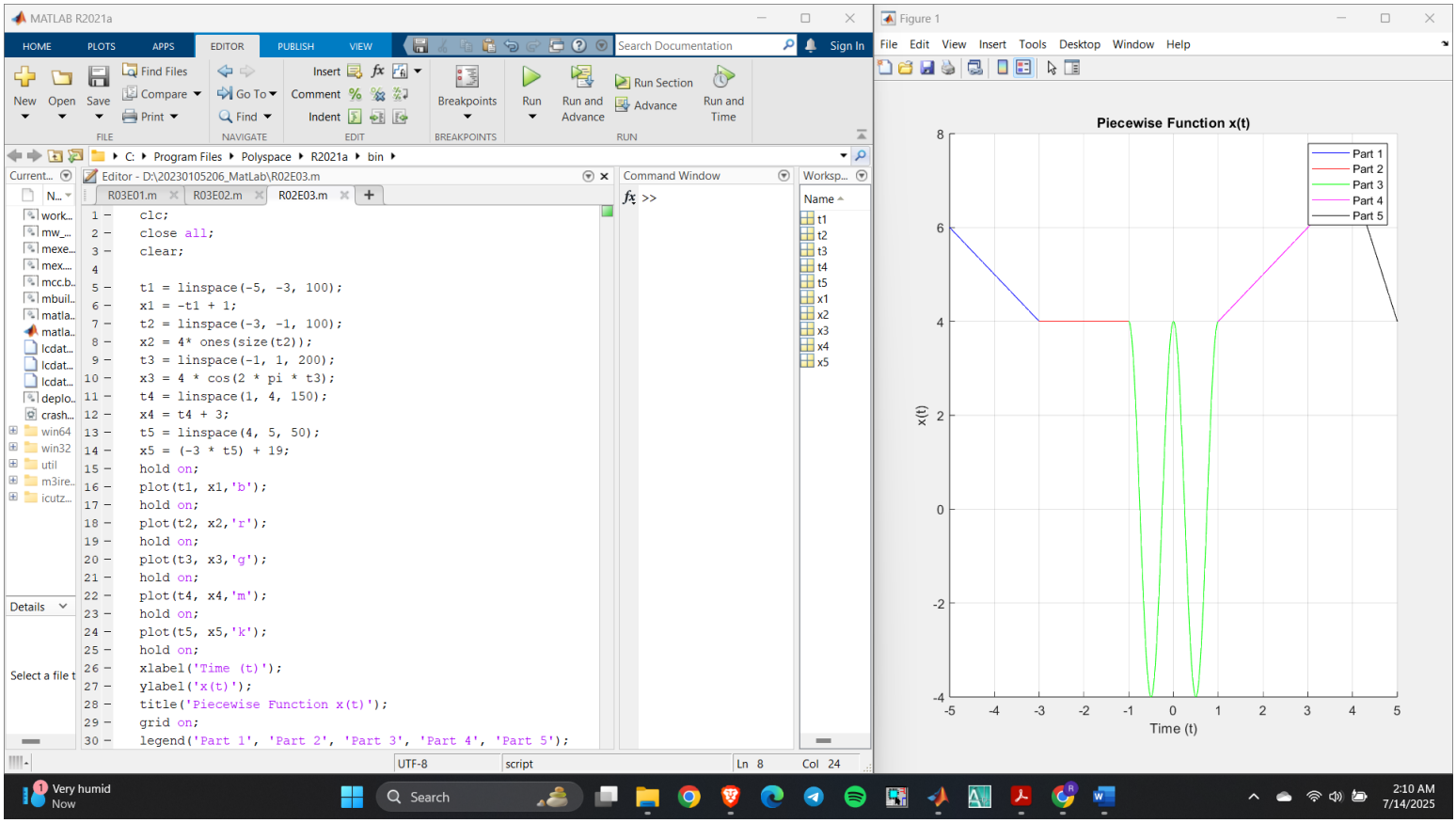




Exercise 3.

Write a code to plot the following function (x *vs.*t) in MATLAB:

$$x = \begin{cases} -t + 1, & -5 \le t \le -3 \\ 4, & -3 \le t \le -1 \\ 4\cos(2\pi t), & -1 \le t \le 1 \\ t + 3, & 1 \le t \le 4 \\ -3t + 19, & 4 \le t \le 5 \end{cases}$$



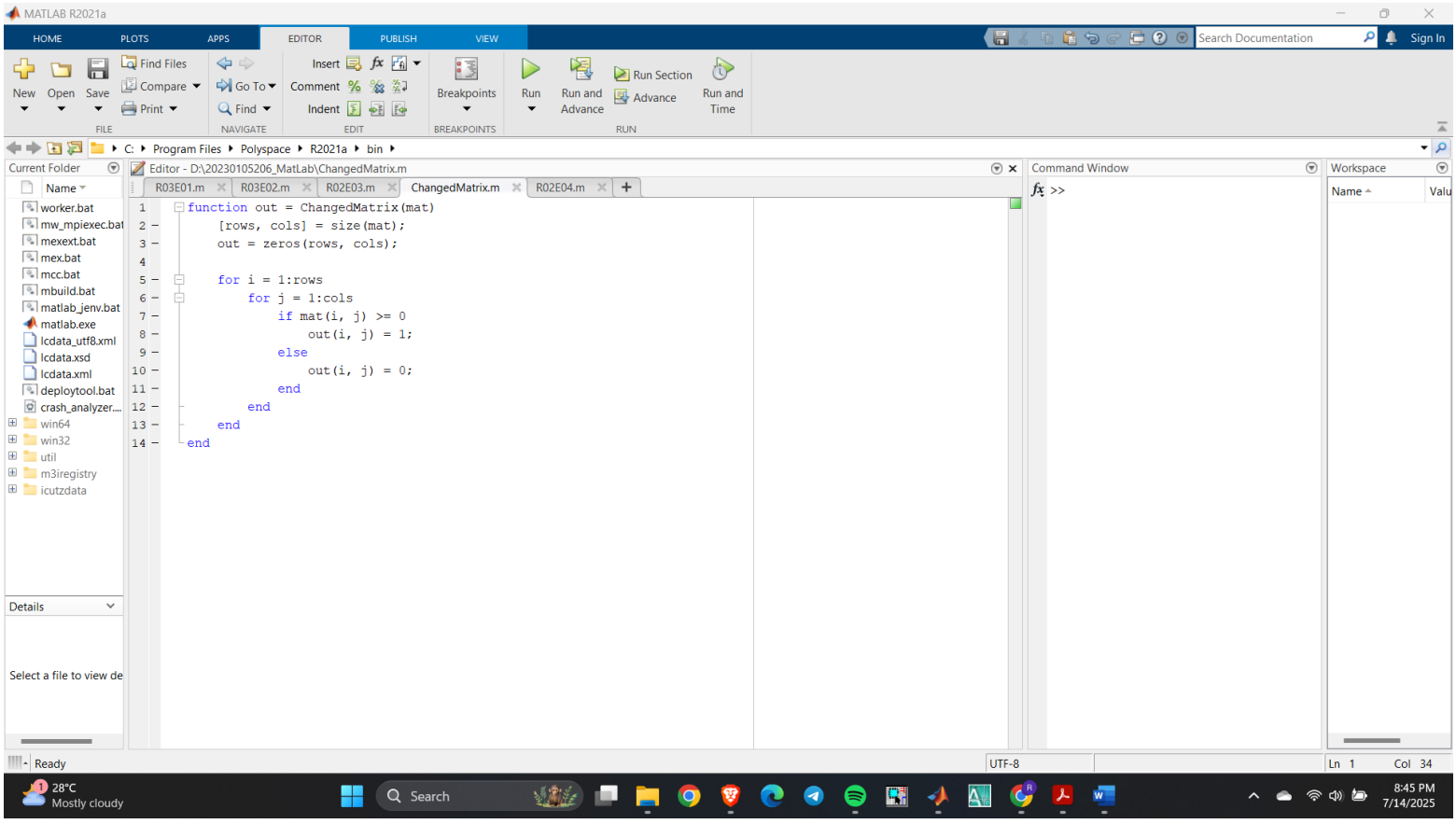
Exercise 4.

You must take a real-valued 2D matrix as input and replace all negative-valued elements of that matrix by 0 and all zero and positive-valued elements by 1. Input 2D matrix may be of arbitrary dimensions.

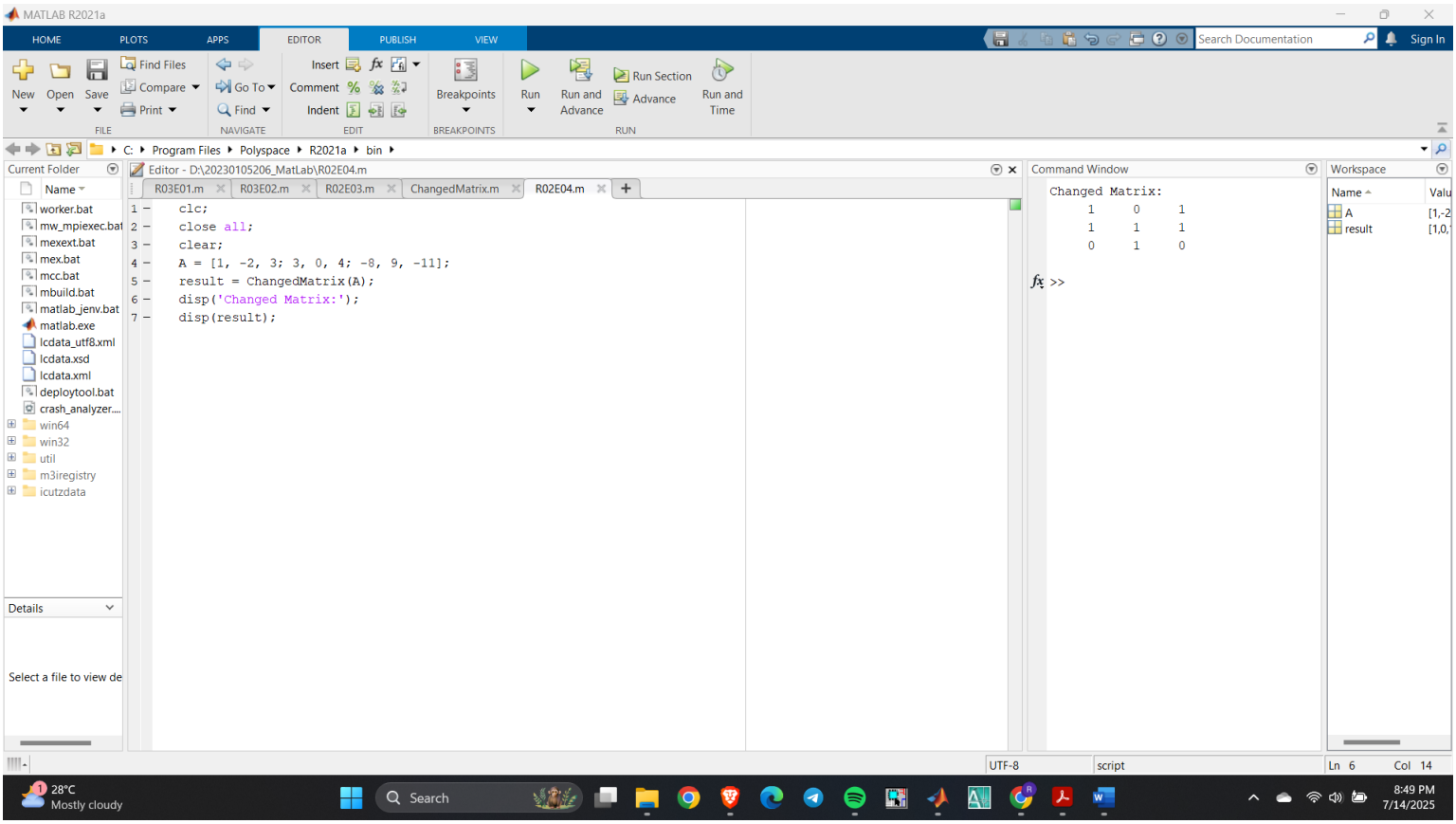
Sample Input	Sample Output
$\begin{bmatrix} 1 & -2 & 3 \\ 3 & 0 & 4 \\ -8 & 9 & -11 \end{bmatrix}$	$\begin{bmatrix} 1 & 0 & 1 \\ 1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$

Use "user defined function" to do this job where input of the main code is a real-valued 2D matrix and output of main code is modified 2D matrix.

User Defined Function:



Main Function:



Exercise 5.

You have to write a code to find the average of best 3 quizzes out of 4 for a student using the following algorithm:

i. Find the lowest number among the all four numbers (do not use any built-in function).
ii. Find the sum of all four numbers (do not use any built-in function).
iii. Subtract the lowest number from the sum of all four numbers to obtain the sum of best three.
iv. Find the average of the best three from the sum.

Use "user defined function" to do this job where inputs of the main code are quiz marks of a student and output of main code is average of best 3 quizzes.

User Defined Function: