

LAB 5: Using Interrupt Instructions in Assembly Language with MASM

Duration: 2 hour

Marks: 10

Note:

- The 8086 instruction set is available in Quanta.
 - A manual on Int 21H with details of available functions is also uploaded.
 - Template for both the questions are uploaded.
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Q1) Write an assembly language program using DOS interrupts that takes a two-digit number as input, finds all its factors, and computes the sum of these factors. The program should then output the sum modulo 10.

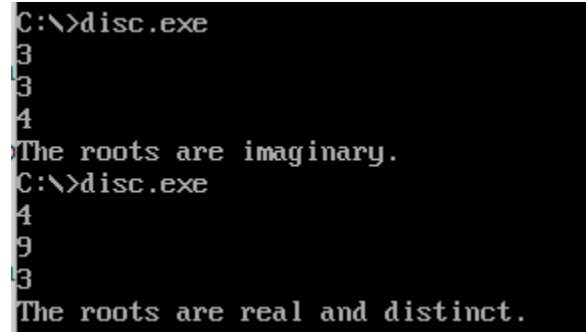
Note: Please ensure that no extra messages are included in the input or output, either in the form of strings or additional text. Any such inclusions will result in an automatic score of zero from the autograder.

```
C:\>fact.exe
25
1
C:\>fact.exe
45
8
C:\>fact.exe
55
2
```

Q2) Write an assembly language program using DOS interrupts that takes three integer inputs representing the coefficients **a**, **b**, and **e** of a quadratic equation $ax^2 + bx + e = 0$. The program should then determine and output the **nature of the roots** based on the discriminant **D** of the quadratic equation.

Compute the discriminant **D** of the quadratic equation using the formula: $D=b^2-4ae$

Note: The coefficients are all single digit integers. Only print the final message as the output depending on the discriminant D . No need to print the value of the discriminant.



```
C:\>disc.exe
3
3
4
The roots are imaginary.
C:\>disc.exe
4
9
3
The roots are real and distinct.
```

NOTE:

- 1) Do NOT change the messages which are present in the template files. Any change will lead to you getting 0 even if your code works fine.
- 2) Please follow the submission instructions provided below as no rechecks will be taken into consideration if there is an issue with your submission format.

SUBMISSION FORMAT:

- 1) Rename your .asm files to 'QX_IDNO'. For example, 'Q1_2022A7PSXXXXG.asm'. Make sure that the ID is in ALL CAPS. Do not zip the files. Upload them directly to Quanta submission link.
- 2) Upload the files on Quanta.