# HCA2101C – Microprogramming Assignment (25% module weight)

Assemble a program named **menu.exe** in MASM6.15 using .586 instructions with the following specifications:

You program should have a menu screen consisting of 6 options with an input selection line below as follows:

```
                    MENU
1.    Factorial
2.    Prime Numbers
3.    Quadratic equation root
4.    Area of a quadrilateral using Brahmagupta Formula
5.    Binary
6.    Exit Program

Please choose an option:
```

*(The program should only take inputs 1 to 6. Any other inputs should display back the input selection line above until a valid input is entered)* **[2 marks]**

**Option 1:** This prompts the user to enter **a positive integer** and should output the factorial of the integer as answer. (**Note: 2 marks** will be obtained for up to 9! - **3 marks** for up to 12! - **6 marks** for > 12!)

**Option 2:** This prompts the user for **a positive integer**, say **n** and outputs the first **n** consecutive prime numbers. (**Example:** if you input 9, output should display: 2,3,5,7,11,13,17,19,23.) **[8 marks]**

**Option 3:** The program asks the user to enter **3 values** for **a, b** and **c** according to the equation $ax^2 + bx + c = 0$ and output only the positive root for x. (**Example:** if inputs are 2, 5, -3 respectively, then x=0.5) **[10 marks]**

**Option 4:** The user is asked to enter the length of the 4 sides (**a, b, c** and **d**) of any quadrilateral and output the area using Brahmagupta formula $A=\sqrt{(s-a)(s-b)(s-c)(s-d)}$ where $s=(a+b+c+d)/2$ **[10 marks]**

**Option 5:** The program should ask the user to enter **a positive decimal integer** and should output the binary equivalent on screen. **[3 marks]**

**Option 6:** This option exits the program. **[1 mark]**

You should zip the executable file **menu.exe**, source file **menu.asm** and object file **menu.obj** in **<your_index_number>.zip** file and mail me at bee21bft@rishiheerasing.net.

You have to put the **index number and name** at the top of the source file (*commenting the lines*).

**Note:** If you encounter any issues while mailing me your assignment as Google might detect your exe file as a virus, you will have to upload your zip file directly on my FTP server. Please refer to a separate link on my website in the assignments section that will guide you.

**The deadline is 21st August 2023.** Late submission will incur usual penalties. **Maximum marks: 40**