9608/42/PRE/O/N/20

Last update: Anuj Verma, 03:16 PM 06/10/2020

# TASK 1.1

Write assembly language program code that allows a user to input 5 characters. The characters are not stored.

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Op code** | **Operand** | **Comment** |
|  | LDM | #0 | // initialise COUNT to 0 |
|  | STO | COUNT |
| LOOP: | IN |  | // input character |
|  | LDD | COUNT | // increment COUNT |
|  | INC | ACC |
|  | STO | COUNT |
|  | CMP | MAX | // is COUNT = MAX ? |
|  | JPN | LOOP | // jump to LOOP if FALSE |
|  | END |  | // end program |
| MAX: | 5 | |  |
| COUNT: |  | |  |

# TASK 1.3

Write assembly language program code that adds the values stored in four consecutive memory locations starting at NUMBER using the Index Register.

Store the final total value in memory location TOTAL.

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Op code** | **Operand** | **Comment** |
|  | LDR | #0 | // initialise Index Register to 0 |
| LOOP: | LDX | NUMBER | // // load value from NUMBER + contents of Index Register |
|  | ADD | TOTAL | // add value to TOTAL |
|  | STO | TOTAL |
|  | INC | IX | // increment Index Register |
|  | LDD | COUNT | // increment COUNT |
|  | INC | ACC |
|  | STO | COUNT |
|  | CMP | MAX | // is COUNT = MAX ? |
|  | JPN | LOOP | // jump to LOOP if FALSE |
|  | END |  | // end program |
| MAX: | 4 | |  |
| COUNT: | 0 | |  |
| NUMBER: | 23 | |  |
|  | 17 | |  |
|  | 38 | |  |
|  | 13 | |  |
| TOTAL: | 0 | |  |

# TASK 1.3

Amend your solution to **TASK 1.1** to allow the program to store each of the characters input into separate, consecutive memory locations starting at the memory locations labelled CHARACTER.

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Op code** | **Operand** | **Comment** |
|  | LDR | #0 | // initialize Index Register to 0 |
| LOOP: | IN |  | // input value |
|  | STX | CHARACTER | // store the value |
|  | INC | IX | // increment the index register |
|  | CMP | MAX | // check for end of loop condition |
|  | JPN | LOOP | // if the loop has not ended, go to LOOP |
|  | END |  | // if the loop has ended, end program |
| MAX: | 5 | |  |
| CHARACTER: |  | |  |
|  |  | |  |
|  |  | |  |
|  |  | |  |
|  |  | |  |