University of Central Punjab

Faculty of Information Technology

Computer Organization and Assembly Language (COAL)
Final Term Exam Lab – Spring 2020

Name: **Registration Number**

Total Marks: **Time Allowed: 2.5 hours (2 hrs. and 30 mins)**

Instructions:

1. **Attempt all questions.**
2. **Files name should be save as task1.asm, task2.asm, …**
3. **Submit the files containing codes on Teams of all the questions with proper comments.**
4. **Total number of questions given are 3**

Good Luck

Question 1 **20 marks**

Division can be performed by using repeated subtraction. Example: if you want to divide 18 by 4, you can do this by subtracting 4, four times.

Write a code in assembly language that will divide two byte sized numbers using repeated subtraction.

Example

Dividend: db 18

Divisor: db 4

Quotient: db 4

Remainder: 2

Display the Quotient and Remainder on display screen at the middle of screen location

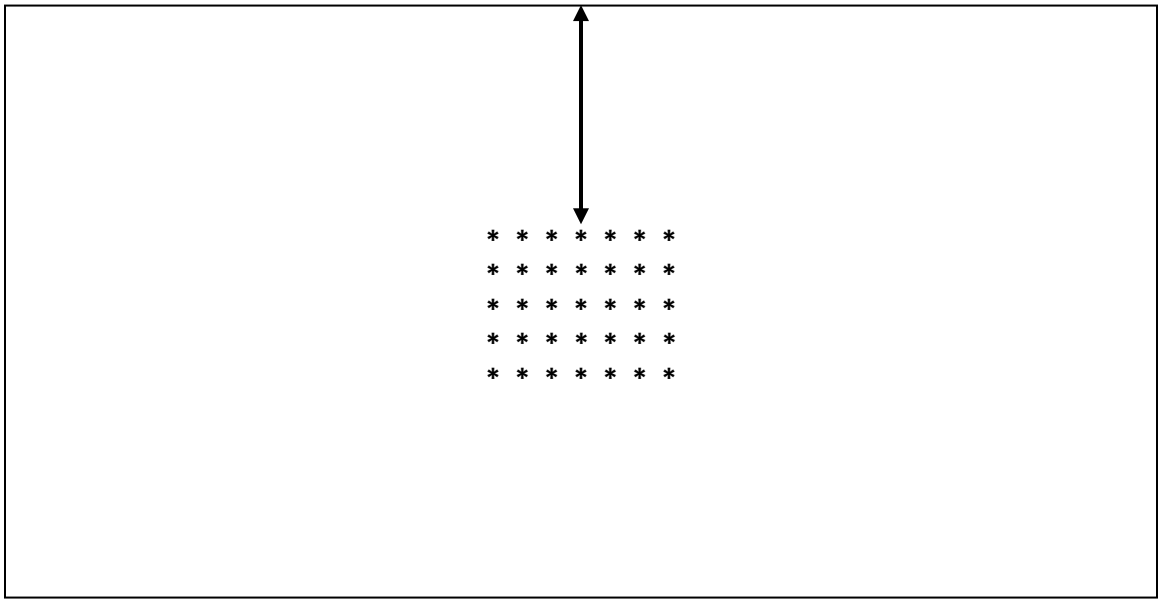
Question 2 **20 marks**

Write an assembly program that will display the shape at the center of screen then move shape in either direction using move key (LEFT, RIGHT, UP, DOWN). When 'Q' key is pressed then program will terminate.

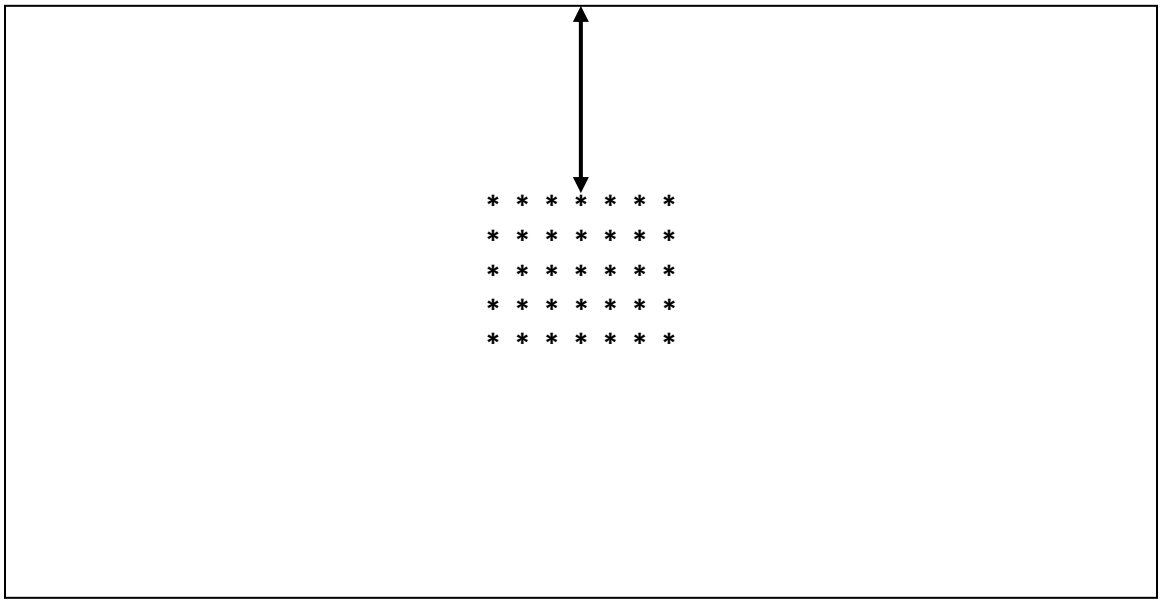
- When user press **UP** key, the shape should be displayed on the previous row.
- When user press **DOWN** key, the shape should be displayed on the immediate next row.
- When user press **LEFT** key, the shape should be displayed on the previous column.
- When user press **RIGHT** key, the shape should be displayed on the immediate next column.

Note: Bidirectional arrow is to help you visualize the movement of shape when upward key is pressed.

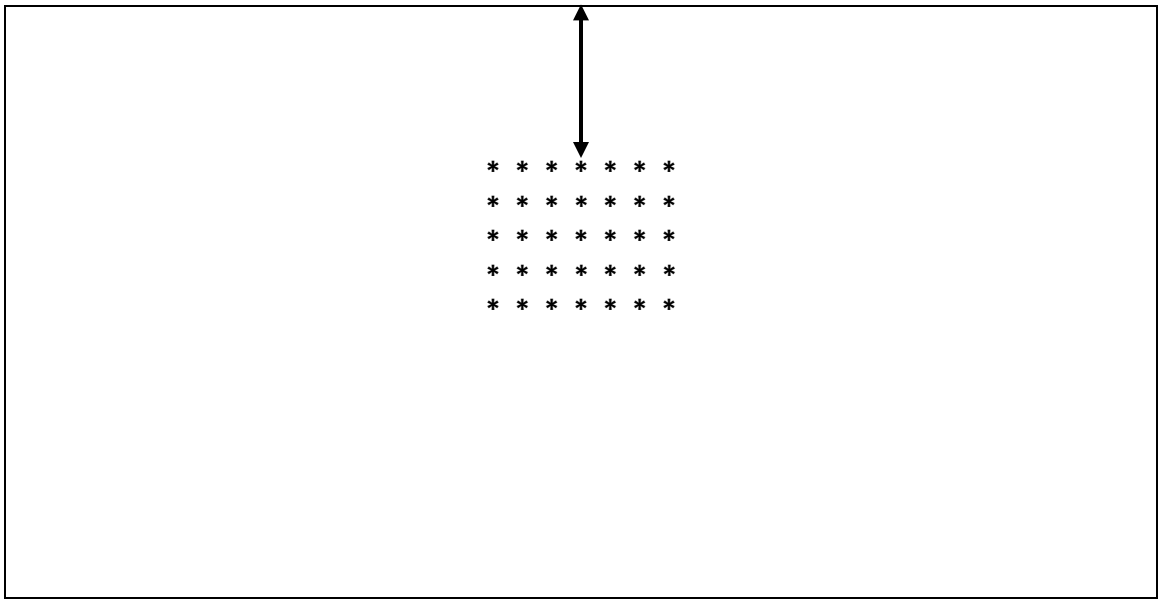
Example: Shape is rectangle



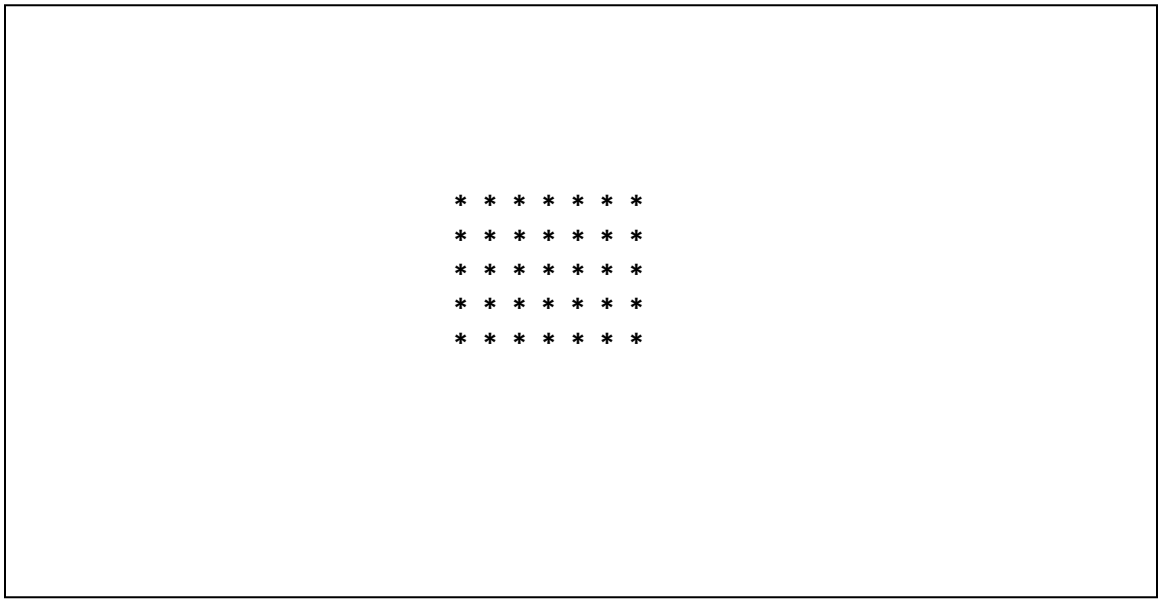
up arrow key is pressed



up arrow key is pressed



left arrow key is pressed



Question 3 **20 marks**

Write a program which takes two addresses from the user in hexadecimal format and display the memory content found between these two points. (Actually displaying the garbage values of memory between these two points). Difference between two points should be greater than 1 and less than 30.

Example 1

```
Enter the first offset:
1AC7
Enter the second offset:
1AE6

 56 53 83 EC 3C 89 D3 89 CF 85 C0 74 08 83 78 0C
 01 75 02 8B 00 E8 F3 F6 FF FF 89 C6 85 C0 74 06
```

Example 2

```
Enter the first offset:
1AC7
Enter the second offset:
1AD0
 56 53 83 EC 3C 89 D3 89 CF 85
```