Assignment Date : 23.11.2023
Due Date   : 21.12.2023 at 23:59

- Student must do the homework without any collaboration.
- Automatic plagiarism detection software will be used for scanning the submitted files.
- If significant similarities are found between submitted files, it will be considered
  as plagiarism, and those homework grades will be zero.
- File should be submitted to Ninova only, email submission is not accepted.
- Program should work without compiler errors and generate correct results as expected.

▪ Write a complete 8086 Assembly program to do the followings.
▪ Use the general program template that is in the Lecture3 slide.
▪ The DOSBox Emulator & MASM Assembler/Linker should be used for testing the homework.

▪ Initialize the computer screen in video graphics mode as VGA 320x200 pixels.
▪ Define the necessary variables to describe a rectangle with the following initial decimal pixel values.
▪ Top-leftmost coordinates of the rectangle in screen : Column location=50, Row location=50
  Width (number of columns) and Height (number of rows) of rectangle : Width=70, Height=40
  Color : Choose any 4-bit color as the drawing color of rectangle.
▪ By looping, draw the rectangle on screen, initially as unfilled.
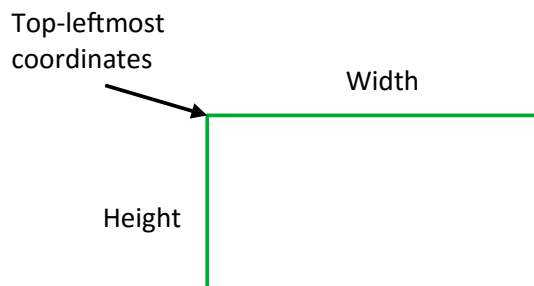
USER INTERFACE

The program should use the following BIOS and MS-DOS interrupt services.
BIOS Video graphics pixel drawing   : INT 10h / Function 0Ch
BIOS Keypress reading   : INT 16h / Function 10h
MS-DOS Writing string to screen   : INT 21h / Function 09h

User will press the following keys (without using the ENTER key) on the computer keyboard as command:
(Mouse will not be used for user interface commands.)

Key	Description of command
0	Program redraws the rectangle as unfilled.
1	Program redraws the rectangle as filled.
Left, Right, Up, Down arrows	Program moves the entire rectangle 1 pixel to the arrow's direction. Method: First draw the old rectangle with black background color, then, calculate the new location and redraw it with the drawing color.
Escape	Exit from program.

The followings are hexadecimal numbers in the AL register that contains ASCII key value pressed by user.
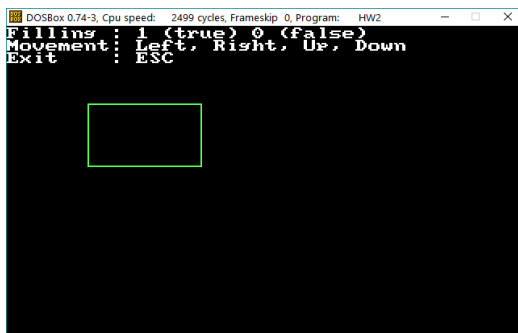
0 Key   : 30h
1 Key   : 31h
Escape key   : 1Bh

The followings are hexadecimal numbers in the AH register that contains arrow key value pressed by user.
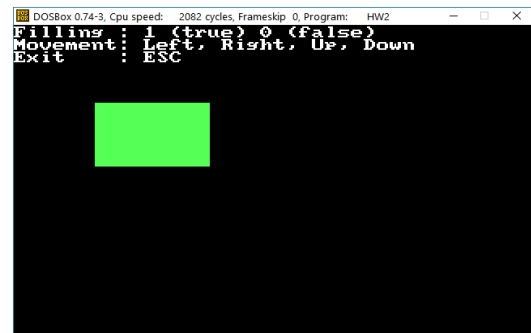
Left arrow   : 4bh
Right arrow   : 4dh
Up arrow   : 48h
Down arrow   : 50h

TESTING THE PROGRAM IN DOSBOX EMULATOR

1) Program draws the initial rectangle.

2) User presses 1 on keyboard.
   Program redraws the rectangle as filled.

3) User presses right arrow key and down arrow key several times. Program calculates new coordinates and redraws the rectangle every time an arrow key is pressed.

4) User presses 0 on keyboard.
   Program redraws the rectangle as unfilled.