* It is an open book and open notes exam.
* Write neat and well-commented programs.
* You are not allowed to use any assembly instruction that is not taught in the class.

**Question 1: [10 Marks]**

Write a subroutine ***Trimmer*** that trims all the occurrences of string2 from string1. The subroutine takes two parameters, a null terminated ***string1*** and a null terminated ***string2***. An example is given below:

**String1:** db ‘ I m nobody! Who are you? Are you nobody too? Then theres a pair of us-dont tell! They d banish us you know from I m nobody! Who are You? ‘,0

**String2:** db ‘nobody’,0

After your program is executed ***String1*** should be trimmed like this:

**String1:** db ‘ I m ! Who are you? Are you too? Then theres a pair of us-dont tell! They d banish us you know from I m ! Who are You? ‘,0

**Note:** The subroutine should use ***string instructions*** and you can safely assume that String2 will be smaller than String1. You don’t need to write the driver program.

**Question 2: [10 Marks]**

Write a subroutine ‘flip’ that creates a flipped image of the upper half of the screen on the lower half such that the top left character appears as the bottom right character in the flipped image (see example below. Left image is original image while Right image is flipped one). Note that the subroutine will override the original lower half.

|  |  |
| --- | --- |
| abcdef  ghijk  qrstuv | abcdef  ghijk  fedcba |

**Question 3: [10 Marks]**

**(i)** Given this piece of code what is the cx and bl after this code is executed?

mov cx, 0xFFFF

mov bl, 0x0004

div bl

jcxz l2

mov cx,1

l2:

mov cx,0

CX = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, BL = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(ii)** Assume IP starts executing at L1. Will anything be displayed on video memory?

ISR\_INT1:

; it prints ‘hi everyone’ on display memory

IRET

MyISR\_80:

**L1:** pushf

pop ax

or ax , 0x0100

push ax

popf

mov ax, 0xEE43

mov dx , 0x5543

add ax, dx

IRET ; it will return to label exit

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exit: mov ax, 0x4c00

INT ox21