National University of Computer and Emerging Sciences

Laboratory Manual

for

Computer Organization and Assembly Language Programming

(EL 213)

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Objectives

After performing this lab, students shall be able to:

- ✓ Subroutines
- ✓ Recursive Subroutines
- ✓ Stack

Exercise 1: Write a recursive subroutine, which takes array address and 16-bit number (N) as parameters, and store 1 to N numbers at a given address in decreasing order.

Pseudo Code

```
FillArray(arrayaddress,N)
if N>=1
        [Arrayaddress]=N

        INC arrayaddress

        FillArray(arrayaddress,N-1)
else

        return
```

Exercise 2: Write a function that takes three numbers as the input argument and return the highest number as an output argument. The arguments (input/output) are to be passed to function on the stack. Create a local variable in a function to keep track of the max number. All the values of registers should be saved and restored before and after the call. After the return from function pop the output in ax.

Exercise 3: Write an assembly subroutine that moves an asterisk over the boundaries of screen. The asterisk should start its movement from top left corner, go towards right, then move downwards, then towards left and lastly moves upwards. Only 1 asterisk should be visible on the screen at a given time. You might need to write a delay subroutine so that the movement of star is visible.