National University of Computer and Emerging Sciences

Prefinal

Computer Organization and Assembly Language



Prefinal

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| --- | --- |
| **Class** | DS3 |
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# Objectives

* Display memory
* Bit Manipulation
* Subroutines

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**Note for all questions**: You can make as many memory variables and subroutines as you need. Must read all the manual before starting.

## ACTIVITY 1: [20 Marks]

Initialize with last 4 digits of your roll number as **Hexadecimal number** (for example, if your roll number is 16L-4195 then should be initialized with 0x4195). Write a subroutine which separates every digit of your roll number.

Write another subroutine to determine and described as follows:

If your roll number is 16L-4195 then

And

**.**

## ACTIVITY 2: [20 Marks]

Initialize with last 4 digits of your roll number as **Hexadecimal number** (for example, if your roll number is 16L-4195 then should be initialized with 0x4195).

Write a program which performs ***Recursive Swapping*** and returns Yellow highlighted answer from your roll number.

For Example:

| **AX** | **Contents of AX (Your Roll #)** |
| --- | --- |
| **Before** | **4 1 9 5** |
| **Mask1** | **? ? ? ?** |
| **Step1** | **9 5 4 1** |
| **Answer** | **9 5 4 1** |
| **Mask2** | **? ? ? ?** |
| **Step2** | **5 9 1 4** |
| **Answer** | **5 9 1 4** |

Hint! First, swap two bytes using **Mask1**, then swap every nibble of both bytes together using **Mask2** to finally result the Answer.

**PF\_Array for Activity 3,4,5  
Initialize a *PF\_Array* of 100 numbers as shown below.**

PF\_Array: dw 566, 189, 243, 60, 131, 403, 238, 612, 32, 26, 285, 501, 503, 241, 758, 98, 380, 545, 99, 659, 652, 580, 232, 530, 956, 701, 790, 967, 958, 745, 341, 400, 988, 20, 384, 571, 126, 886, 549, 983, 619, 876, 369, 221, 474, 818, 900, 983, 178, 176, 824, 188, 141, 467, 128, 705, 200, 885, 647, 841, 571, 551, 909, 499, 456, 796, 766, 530, 68, 51, 559, 927, 444, 188, 452, 688, 526, 307, 267, 572, 315, 512, 481, 824, 72, 905, 581, 937, 300, 42, 31, 914, 971, 872, 633, 632, 794, 666, 406, 133

## ACTIVITY 3: [20 Marks]

Write a program which finds the top three numbers from *PF\_Array* without using any sorting algorithm.

## ACTIVITY 4: [20 Marks]

Write a program which sorts the first 50 values of ***PF\_Array*** in ascending order and the next 50 values in descending order. Make a new array **PF\_Dual\_Sort** and store the answers.

Show in memory all the sorted array values, in the form of screenshots.

## ACTIVITY 5: [20 Marks]

Write a program which prints the **PF\_Dual\_Sort** from activity 4 on DosBox console in Text Mode (25X80).