National University of Computer and Emerging Sciences

Lab Manual 03
Computer Organization and Assembly Language Lab

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Section	BCS 3E
Semester	Fall 2021

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Chapter 4 - Bit Manipulations
Lab Manual 03

Activity 1: Write a program to swap every pair of bits in the AX register i.e. swap bit no 0 with bit no 1, bit no 2 with bit no 3 and so on.

Sample Run:

AX before Swap	**10 11 00 10 01 01 11 01**
AX after Swap	**1 11 00 01 10 10 11 10**

Activity 2: [Bit Manipulation] Calculate the number of one bits in BX and complement an equal number of least significant bits in AX. HINT: Use the XOR instruction.

Sample Run:

Initial value of BX	**Total No of 1 Bits in BX**	**Initial value of AX**	**AX after Complementing 7 least significant bits**
1011 0001 1000 1001	7	1010 1011 **1010 0101**	1010 1 **1101 1010**

Activity 3: AX contains a number between 0-15. Write code to complement the corresponding bit in BX. For example if AX contains 6; complement the 6th bit of BX.

Activity 4: Write a program to search a particular element from an array using binary search. If the element is found set AX to one and otherwise to zero. Binary Search searches a number from a sorted array. Shifting a number to right divides it by 2. Do not use division instruction use shifting for division.

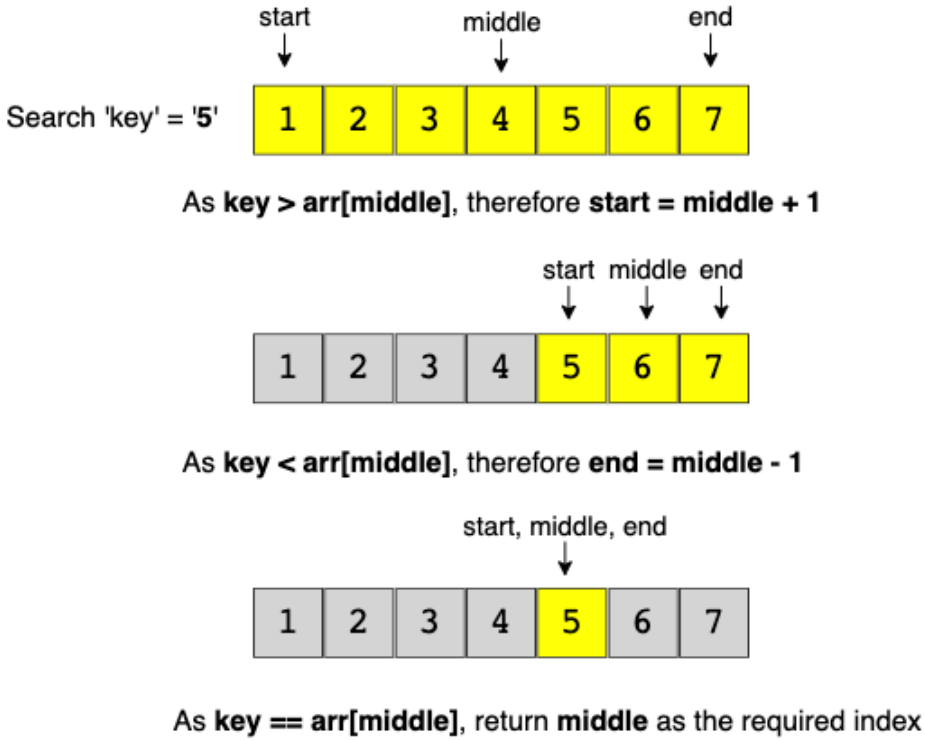

Figure 1: Binary Search Procedure