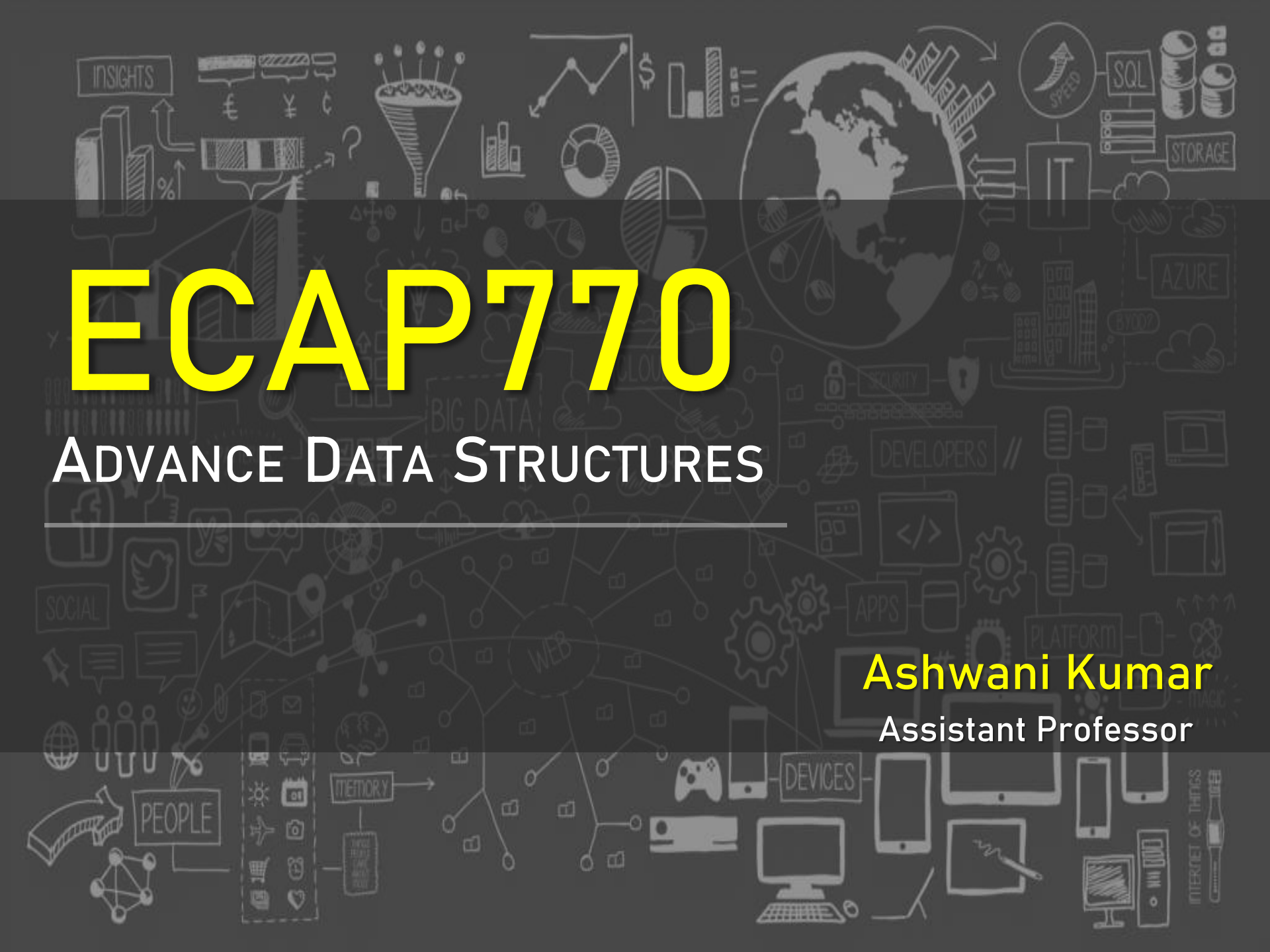

ECAP770

Advance Data Structures

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Learning Outcomes

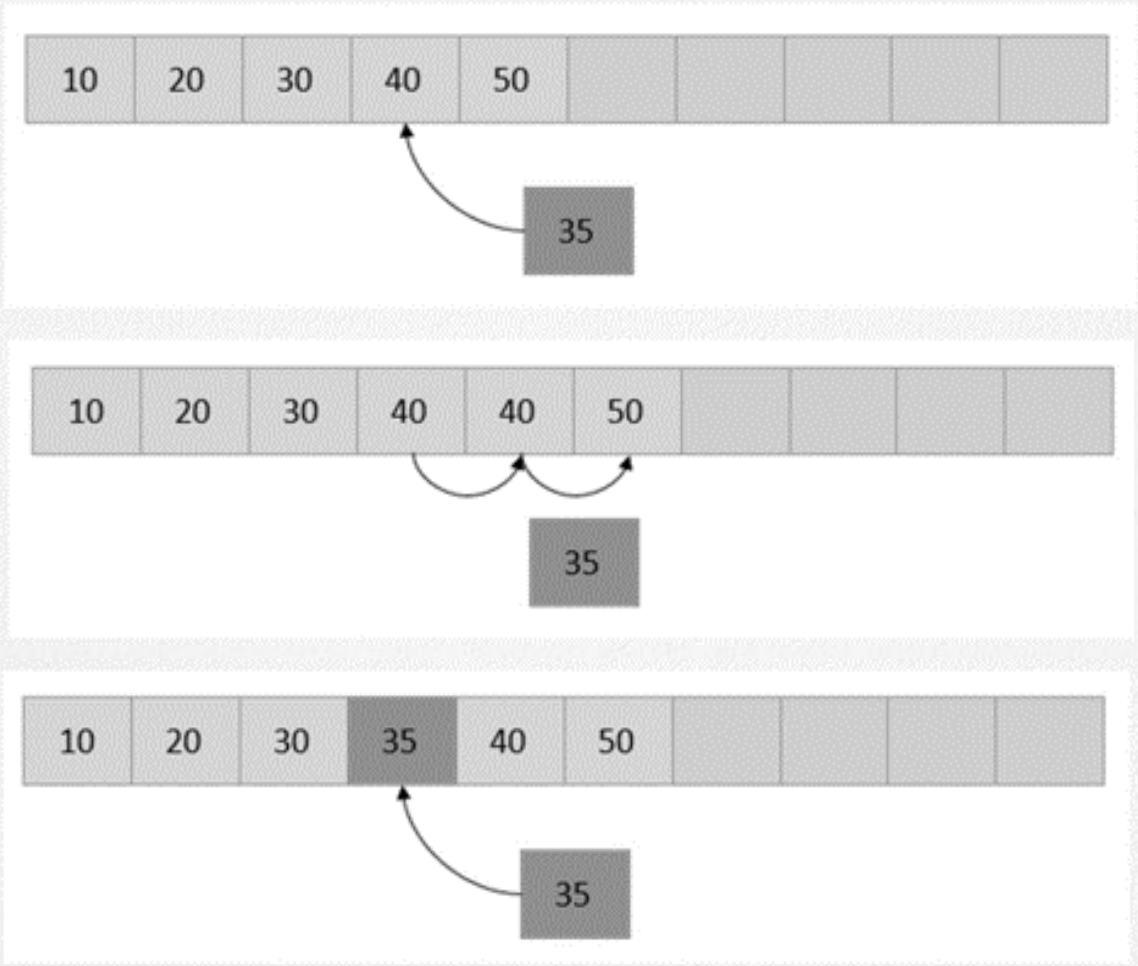
After this lecture, you will be able to

- Array insertion
- Array deletion

Array insertion

- Insertion on array is add a new element in array.
- Element can be inserted at any palace in array.

Array insertion



Array insertion

Array insertion can be done in following cases:

- Insertion at the beginning of an array
- Insertion at the given index of an array
- Insertion after the given index of an array
- Insertion before the given index of an array

Algorithm

- Here A is an array with N elements. The maximum numbers of elements it can store is defined by MAX.

```
begin
IF N = MAX, return
ELSE
   N = N + 1
   For All Elements in A
      Move to next adjacent location
   A[FIRST] = New_Element
   end
```

Program

```
#include<stdio.h>
#define MAX 5
main()
{
   int arr[MAX]= {10,12,15,20},i,val;
      printf("the array element are \n");
   for(i=0;i<4;i++)
   {
      printf("arr[%d]=%d \n",i,arr[i]);
   }
   for(i=4;i>=0;i--){
         arr[i+1]= arr[i];
                  }
        val=210;
         arr[2]=val;
         printf("array after insertion \n");
         for(i=0;i<5;i++){
            printf("arr[%d]=%d \n",i,arr[i]);
         }
}
```

Output

```
the array element are
arr[0]=10
arr[1]=12
arr[2]=15
arr[3]=20
array after insertion
arr[0]=10
arr[1]=10
arr[2]=210
arr[3]=15
arr[4]=20

Process returned 0 (0x0)   execution time : 0.020 s
Press any key to continue.
```

Array Deletion

- Array deletion removes an existing element from the array and re-organizing all elements of an array.
- Element can be deleted at any palace in array.

Algorithm

A is an array

N is number of elements (size)

Element is a deleted data element

Pos is the location of the element to be deleted. Deletion (A, N, Pos)

- Step 1: Element = A [Pos]
- Step 2: for i = Pos to N-1 repeat
- step 3 Step 3: A[i] = A[i+1] End for
- Step 4: N = N - 1

Program

```
#include<stdio.h>

main()

{

   int arr[]= {10,12,15,20},i,pos=1;

      printf("the array element are \n");

   for(i=0;i<4;i++)

   {

      printf("arr[%d]= %d \n",i,arr[i]);

   }
```

```
for (i = pos - 1; i < 4 - 1; i++)

      arr[i] = arr[i+1];


   printf("Resultant array:\n");


   for (i = 0; i < 4 - 1; i++)

      printf("arr[%d]= %d\n",i,
arr[i]);

}
```

Output

```
the array element are
arr[0]= 10
arr[1]= 12
arr[2]= 15
arr[3]= 20
Resultant array:
arr[0]= 12
arr[1]= 15
arr[2]= 20

Process returned 0 (0x0)   execution time : 0.016 s
Press any key to continue.
```

Exercise

- Program to demonstrate insertion operation on array
- Program to demonstrate deletion operation on array

That's all for now...