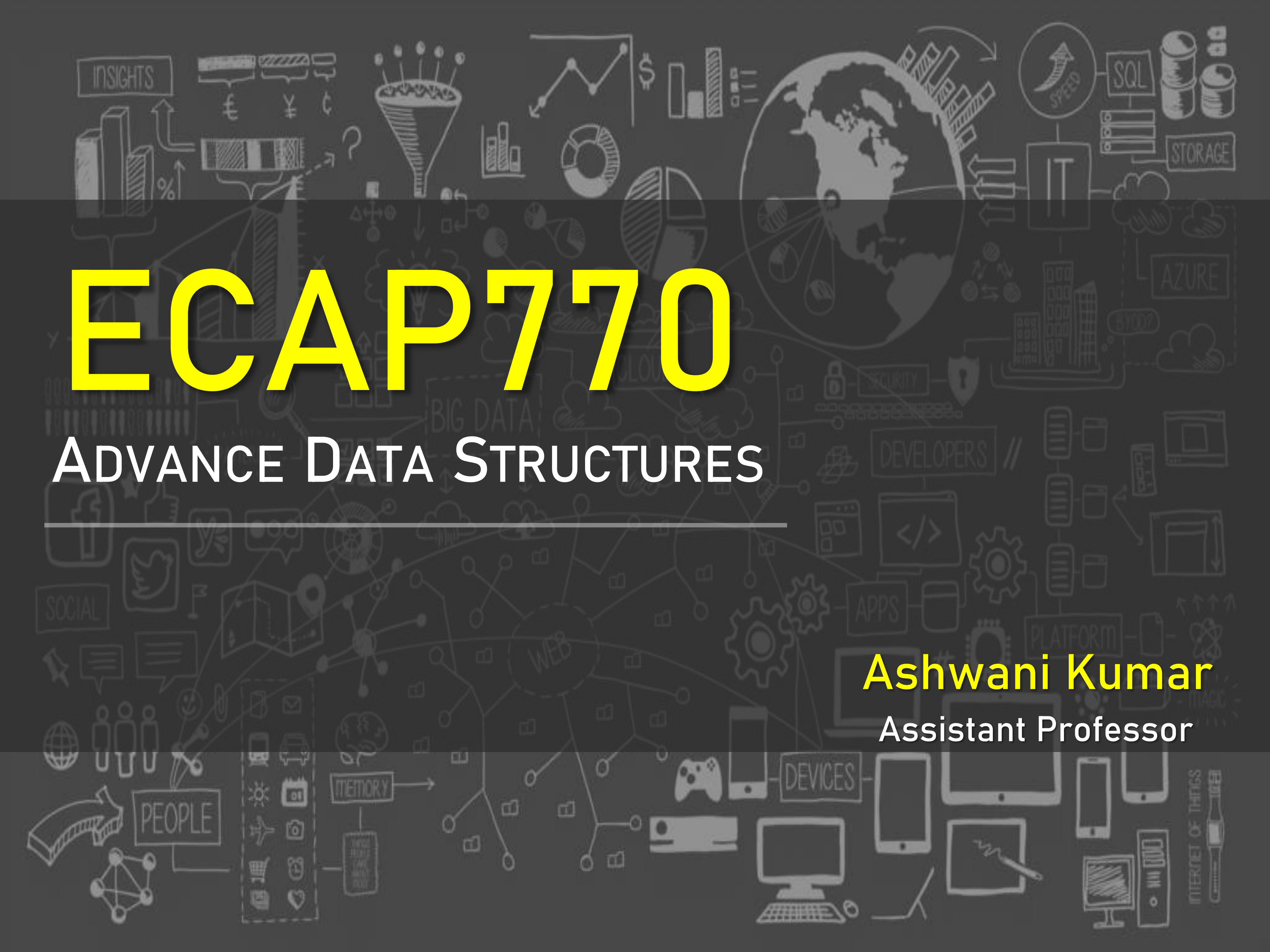


ECAP770

Advance Data Structures

Ashwani Kumar
Assistant Professor

Learning Outcomes

After this lecture, you will be able to

- search operation on arrays
- merging of two arrays

Array Search

- Searching is a process in which we find element in the array.
- This method accepts only one argument, value. It is non-destructive method, which means it does not affect the array values.
- Linear Search
- Binary Search

Algorithm

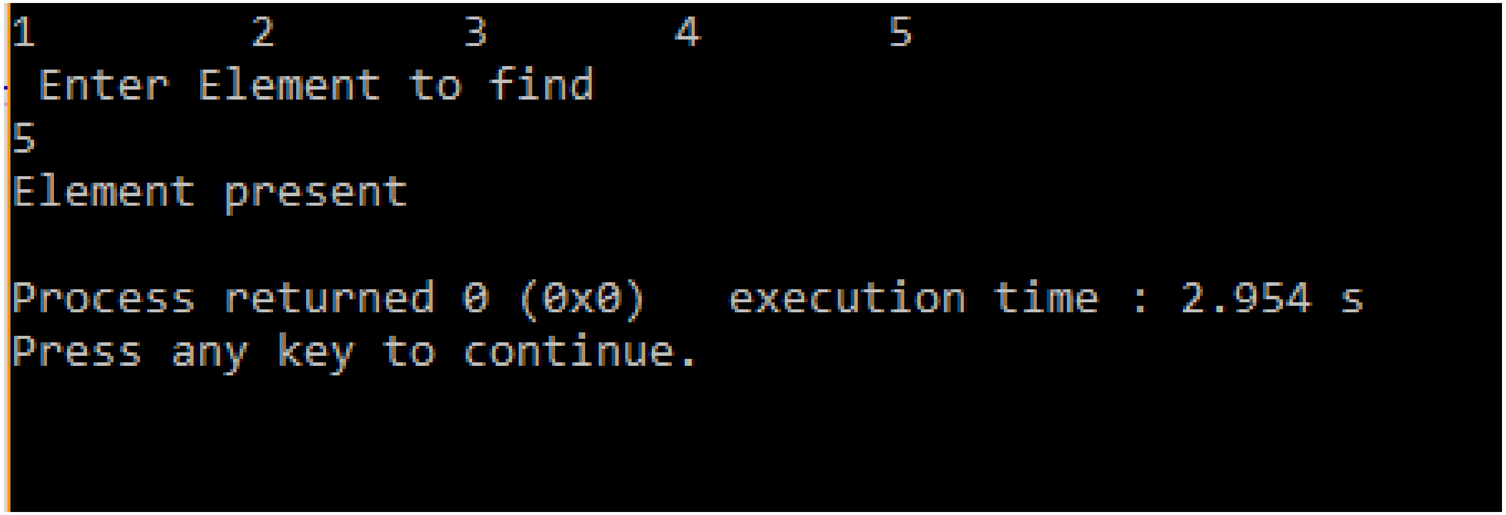
Consider Arr is a linear array with N elements. Following is the algorithm to find an element with a value of ITEM using sequential search.

```
1. Start
2. Set $J = 0$
3. Repeat steps 4 and 5 while $J < N$
4. IF Arr[J] is equal ITEM THEN GOTO STEP 6
5. Set $J = J +1$
6. PRINT J, ITEM
7. Stop
```

Program

```
#include<stdio.h>
main(){
int arr[5]={1,2,3,4,5};
int toS,i,flag=0;
for(i=0;i<5;i++)
    {
    printf("%d \t ", arr[i]);
    }
printf("Enter Element to find \n");
scanf("%d",&toS);
for(i=0;i<5;i++)
{
    if(arr[i]==toS){
        flag=1;
    }
}
 if(flag==1){
    printf("Element present \n");
 }
 else{
 printf("Element not present");
 }
}
```

Output



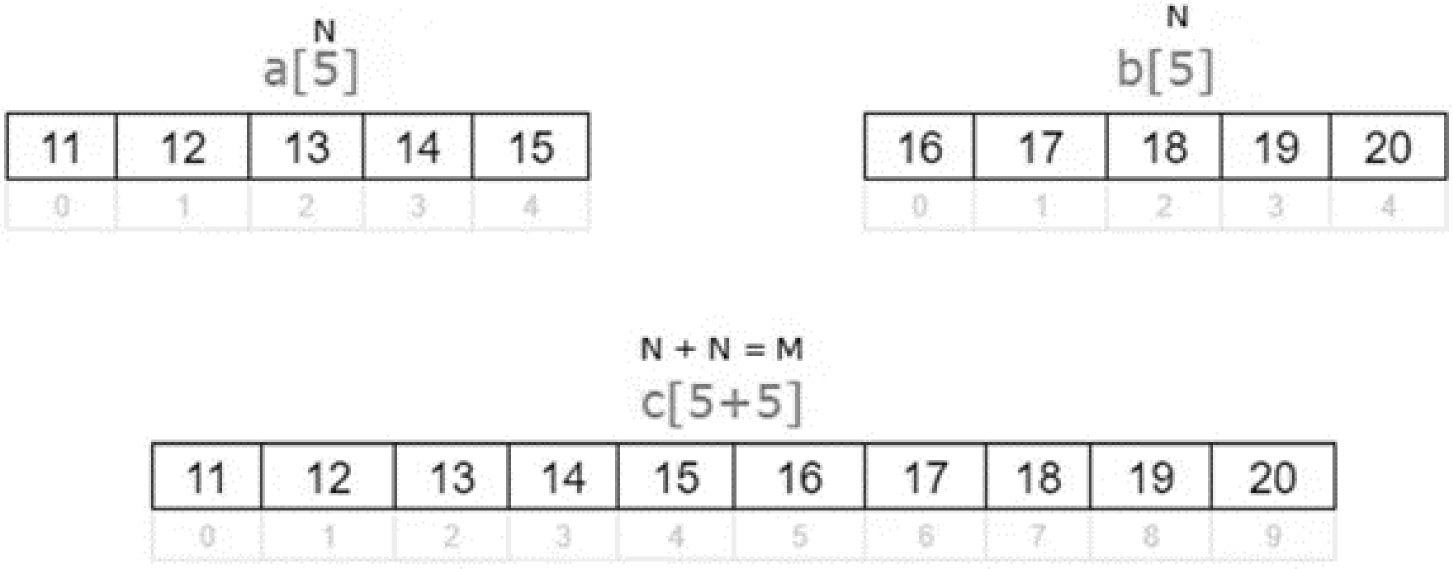
```
1         2         3         4         5
 Enter Element to find
5
Element present

Process returned 0 (0x0)   execution time : 2.954 s
Press any key to continue.
```

Merging of two arrays

- Merging of two arrays means combining two separate arrays into one single array.
- To merge two arrays, we need at least three array variables.

Merging of two arrays



N

a[5]

11	12	13	14	15
0	1	2	3	4

N

b[5]

16	17	18	19	20
0	1	2	3	4

N + N = M

c[5+5]

11	12	13	14	15	16	17	18	19	20
0	1	2	3	4	5	6	7	8	9

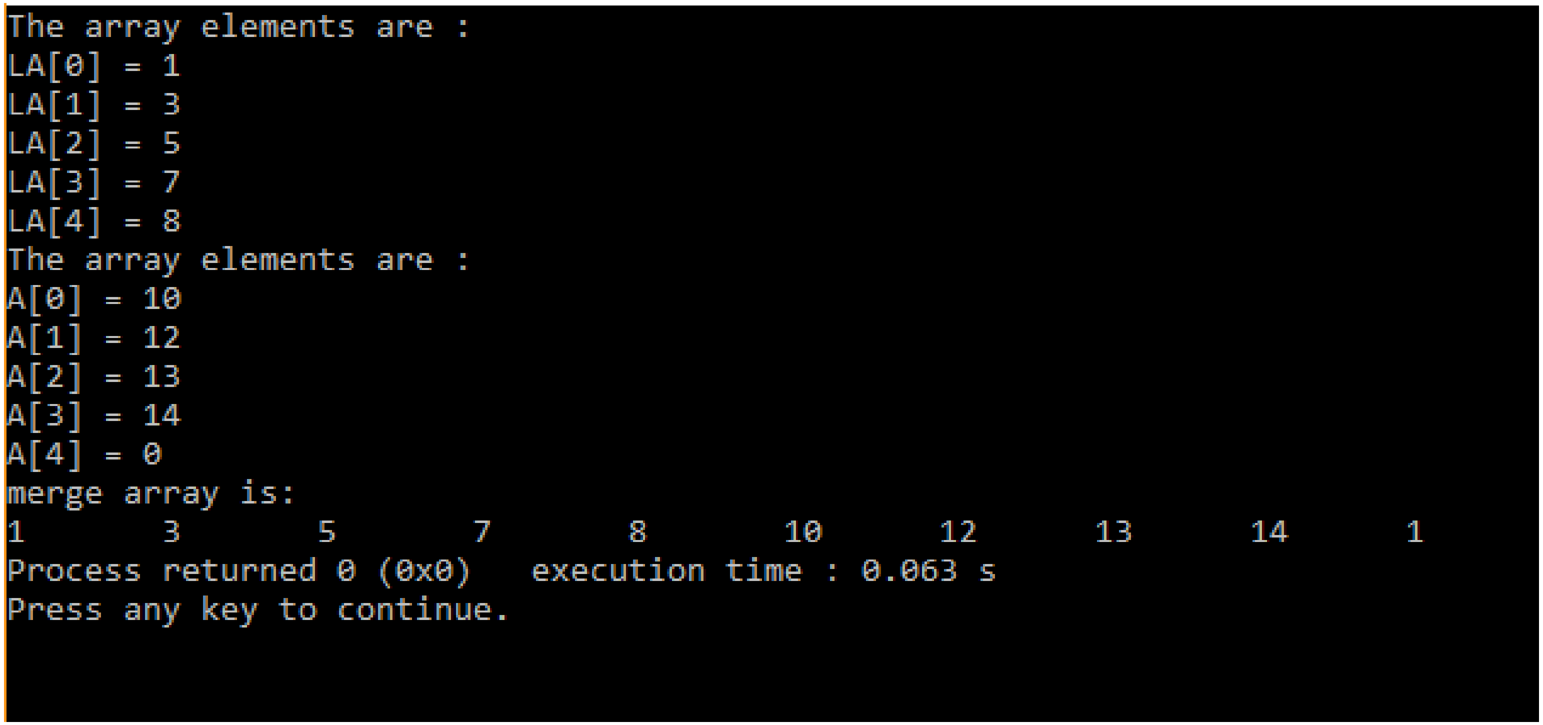
Algorithm

```
START
   Step 1 → Take three array variables A, B, and C
   Step 2 → Store even values in array B
   Step 3 → Store odd values in array C
   Step 4 → Start loop from 0 to sizeof(B)
   Step 5 → Copy B[n] to A[index]
   Step 6 → Start loop from 0 to sizeof(C)
   Step 7 → Copy C[n] to A[index]
   Step 8 → Display A
STOP
```

Program

```
#include <stdio.h>
main() {
  int LA[] = {1,3,5,7,8},i,index=0,c[10];
  printf("The array elements are :\n");
  for(i=0;i<5;i++)
   {
    printf("LA[%d] = %d \n", i, LA[i]);
  }
int A[] = {10,12,13,14};
  printf("The array elements are :\n");
  for(i=0;i<5;i++)
   {
    printf("A[%d] = %d \n", i, A[i]);
  }
printf("merge array is: \n");
for(i=0;i<5;i++)
    c[index++]=LA[i];
for(i=0;i<5;i++)
    c[index++]=A[i];
for(i=0;i<10;i++){
    printf("%d \t",c[i]);
}
}
```

Output



```
The array elements are :
LA[0] = 1
LA[1] = 3
LA[2] = 5
LA[3] = 7
LA[4] = 8
The array elements are :
A[0] = 10
A[1] = 12
A[2] = 13
A[3] = 14
A[4] = 0
merge array is:
1       3       5       7       8       10      12      13      14      1
Process returned 0 (0x0)   execution time : 0.063 s
Press any key to continue.
```

Exercise

- Program to demonstrate search operation on array
- Program to demonstrate concatenation operation on array

That’s all for now…