1. Write a program to read and print elements of an array.

IPO
Input Enter a value as a input
Process to read and print elements of an array.
Output output the variable

Program

```
#include <stdio.h>
int main() {
    int n, i;
    printf("Enter the number of elements in the array: ");
    scanf("%d", &n);
    int arr[n];  // Declare an array of size n
    printf("Enter %d elements:\n", n);
    for(i = 0; i < n; i++)
 {
        scanf("%d", &arr[i]);
    }
    printf("The elements of the array are:\n");
    for(i = 0; i < n; i++)
 {
        printf("%d ", arr[i]);
    }
    return 0;
}
```

Output

```
Enter the number of elements in the array: 5
Enter 5 elements:
10 20 30 40 50

The elements of the array are:
10 20 30 40 50
```

2. Write a program to find the sum of elements of an array.

IPO
Input Enter a value as a input
Process to find the sum of elements of an array.
 Output output the variable

Program

```
#include <stdio.h>
int main()
 {
    int n, i, sum = 0;
    printf("Enter the number of elements in the array: ");
    scanf("%d", &n);
    int arr[n];  // Declare array of size n
    printf("Enter %d elements:\n", n);
    for(i = 0; i < n; i++)
{
        scanf("%d", &arr[i]);
    }
    for(i = 0; i < n; i++)
 {
        sum += arr[i];
    }
    printf("Sum of the elements = %d\n", sum);
    return 0;
}
```

Output

```
Enter the number of elements in the array: 5
Enter 5 elements:
10 20 30 40 50

Sum of the elements = 150
```

3. Write a program to find the maximum and minimum element in an array.

IPO

Input Enter a value as a input

Process to find the maximum and minimum element in an array.

Output output the variable

Program

```
#include <stdio.h>
int main()
 {
    int n, i, max, min;
      printf("Enter the number of elements in the array: ");
    scanf("%d", &n);
```

```
    int arr[n];  // Declare array of size n
    printf("Enter %d elements:\n", n);
    for(i = 0; i < n; i++)
{
        scanf("%d", &arr[i]);
    }
    max = min = arr[0];
    for(i = 1; i < n; i++)
 {
        if(arr[i] > max)
            max = arr[i];
        if(arr[i] < min)
            min = arr[i];
    }
    printf("Maximum element = %d\n", max);
    printf("Minimum element = %d\n", min);
    return 0;
}
```

Output
Enter the number of elements in the array: 6
Enter 6 elements:
25 13 67 4 89 32

Maximum element = 89
Minimum element = 4

4. Write a program to reverse an array.

IPO
Input Enter a value as a input
Process to reverse an array.
 Output output the variable

Program

```
#include <stdio.h>
int main()
 {
    int n, i;
    printf("Enter the number of elements in the array: ");
    scanf("%d", &n);
```

```
    int arr[n];
       printf("Enter %d elements:\n", n);
    for(i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    printf("Original array:\n");
    for(i = 0; i < n; i++)
{
        printf("%d ", arr[i]);
    }
    for(i = 0; i < n / 2; i++)
{
        int temp = arr[i];
        arr[i] = arr[n - 1 - i];
        arr[n - 1 - i] = temp;
    }
    printf("\nReversed array:\n");
    for(i = 0; i < n; i++)
{
        printf("%d ", arr[i]);
    }

    return 0;
}
```

Output
Enter the number of elements in the array: 5
Enter 5 elements:
10 20 30 40 50

Original array:
10 20 30 40 50
Reversed array:
50 40 30 20 10

5. Write a program to search for an element in an array (linear search).

IPO
Input Enter a value as a input
Process to search for an element in an array (linear search).
Output output the variable

Program

```
#include <stdio.h>
int main()
{
   int n, i, key, found = 0;
   printf("Enter the number of elements in the array: ");
   scanf("%d", &n);
   int arr[n];  // Declare array of size n
   printf("Enter %d elements:\n", n);
   for(i = 0; i < n; i++)
 {
      scanf("%d", &arr[i]);
   }

     printf("Enter the element to search: ");
   scanf("%d", &key);
   for(i = 0; i < n; i++)
 {
      if(arr[i] == key)
 {
         found = 1;
         break;
      }
   }
   if(found)
      printf("Element %d found at position %d\n", key, i + 1);  // 1-based index
   else
      printf("Element %d not found in the array\n", key);

   return 0;
}
```

Output

```
Enter the number of elements in the array: 6
Enter 6 elements:
12 45 67 23 89 5

Enter the element to search: 23
Element 23 found at position 4

Element 23 found at position 4
Element 100 not found in the array
```

6. Write a program to sort an array in ascending order.

IPO
Input Enter a value as a input
Process to sort an array in ascending order.
 Output output the variable

Program

```
#include <stdio.h>
int main()
{
    int n, i, j, temp;
    printf("Enter the number of elements in the array: ");
    scanf("%d", &n);
    int arr[n];  // Declare array of size n
    printf("Enter %d elements:\n", n);
    for(i = 0; i < n; i++)
 {
        scanf("%d", &arr[i]);
    }
    for(i = 0; i < n - 1; i++)
 {
        for(j = 0; j < n - 1 - i; j++)
{
            if(arr[j] > arr[j + 1])
 {
                                temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
            }
        }
    }
    printf("Sorted array in ascending order:\n");
    for(i = 0; i < n; i++) {
        printf("%d ", arr[i]);
    }

    return 0;
}
```

Output
Enter the number of elements in the array: 5
Enter 5 elements:
40 10 30 50 20

Sorted array in ascending order:
10 20 30 40 50

7. Write a program to insert an element in an array.

IPO
Input Enter a value as a input
Process to sort an array in ascending order.
 Output output the variable

Program

```
#include <stdio.h>
int main()
{
   int arr[100], n, i, pos, value;
   printf("Enter the number of elements in the array: ");
   scanf("%d", &n);
   printf("Enter %d elements:\n", n);
   for(i = 0; i < n; i++)
 {
      scanf("%d", &arr[i]);
   }
   printf("Enter the position to insert (1 to %d): ", n + 1);
   scanf("%d", &pos);
   printf("Enter the value to insert: ");
   scanf("%d", &value);
   if(pos < 1 || pos > n + 1)
 {
      printf("Invalid position!\n");
      return 1;
   }
   for(i = n; i >= pos; i--) {
      arr[i] = arr[i - 1];
   }
   arr[pos - 1] = value;
   n++;  // Increase array size
   printf("Array after insertion:\n");
   for(i = 0; i < n; i++)
 {
      printf("%d ", arr[i]);
   }
```

```
    return 0;
}
```

Output
Enter the number of elements in the array: 5
Enter 5 elements:
10 20 30 40 50
Enter the position to insert (1 to 6): 3
Enter the value to insert: 99

Array after insertion:
10 20 99 30 40 50

8. Write a program to delete an element from an array.

IPO
Input Enter a value as a input
Process to delete an element from an array.
Output output the variable

Program

```
#include <stdio.h>
int main()
{
    int arr[100], n, i, pos;
    printf("Enter the number of elements in the array: ");
    scanf("%d", &n);
    printf("Enter %d elements:\n", n);
    for(i = 0; i < n; i++)
 {
        scanf("%d", &arr[i]);
    }

    printf("Enter the position of the element to delete (1 to %d): ", n);
    scanf("%d", &pos);
    if(pos < 1 || pos > n)
 {
        printf("Invalid position!\n");
        return 1;
    }
    for(i = pos - 1; i < n - 1; i++) {
```

```
        arr[i] = arr[i + 1];
    }
    printf("Array after deletion:\n");
    for(i = 0; i < n; i++) {
        printf("%d ", arr[i]);
    }

    return 0;
}
```

Output
Enter the number of elements in the array: 5
Enter 5 elements:
10 20 30 40 50
Enter the position of the element to delete (1 to 5): 3

Array after deletion:
10 20 40 50

9. Write a program to find the frequency of elements in an array.

IPO
Input Enter a value as a input
Process to find the frequency of elements in an array.
Output output the variable

Program

```
#include <stdio.h>
int main()
{
    int arr[100], freq[100];
    int n, i, j, count;
    printf("Enter the number of elements in the array: ");
    scanf("%d", &n);
    printf("Enter %d elements:\n", n);
    for(i = 0; i < n; i++)
 {
        scanf("%d", &arr[i]);
        freq[i] = -1;  // Initialize frequency array
    }
```

```
   for(i = 0; i < n; i++)
 {
       if(freq[i] != 0)
{
           count = 1;
           for(j = i + 1; j < n; j++)
{
               if(arr[i] == arr[j])
{
                   count++;
                   freq[j] = 0;
               }
           }
           freq[i] = count;
       }
   }
   printf("Frequency of each element:\n");
   for(i = 0; i < n; i++)
 {
       if(freq[i] != 0)
 {
           printf("%d occurs %d times\n", arr[i], freq[i]);
       }
   }

   return 0;
}
```

Output
Enter the number of elements in the array: 6
Enter 6 elements:
1 2 2 3 1 4

Frequency of each element:
1 occurs 2 times
2 occurs 2 times
3 occurs 1 times
4 occurs 1 times

10. Write a program to merge two arrays.
IPO
Input Enter a value as a input
Process to merge two arrays.

Output output the variable

Program

```
#include <stdio.h>
int main()
{
   int arr1[100], arr2[100], merged[200];
   int n1, n2, i, j;
   printf("Enter the number of elements in the first array: ");
   scanf("%d", &n1);
   printf("Enter %d elements for the first array:\n", n1);
   for(i = 0; i < n1; i++)
 {
      scanf("%d", &arr1[i]);
   }
   printf("Enter the number of elements in the second array: ");
   scanf("%d", &n2);
   printf("Enter %d elements for the second array:\n", n2);
   for(i = 0; i < n2; i++)
 {
      scanf("%d", &arr2[i]);
   }

     for(i = 0; i < n1; i++)
{
      merged[i] = arr1[i];
   }
   for(j = 0; j < n2; j++)
{
      merged[i + j] = arr2[j];
   }

   // Print the merged array
   printf("Merged array:\n");
   for(i = 0; i < n1 + n2; i++) {
      printf("%d ", merged[i]);
   }

   return 0;
}
```

Output

```
Enter the number of elements in the first array: 3
Enter 3 elements for the first array:
```

10 20 30
Enter the number of elements in the second array: 3
Enter 3 elements for the second array:
40 50 60

Merged array:
10 20 30 40 50 60