SIMPLE ARRAY PROGRAM

AIM:

To demonstrate a simple array program for ascending,descending,number of even elements in the array and unique elements display.

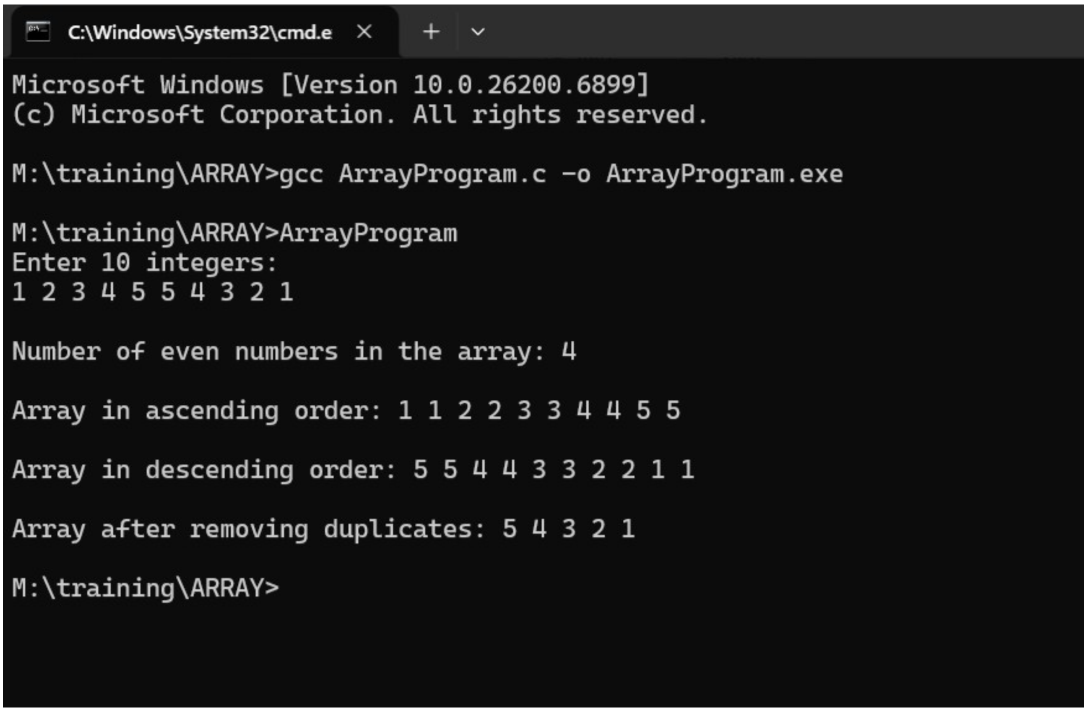
PROCEDURE:

- First, the program includes the stdio.h header file and sets the array size as 10 using #define.
- In the main() function, an integer array of size 10 is created.
- The program asks the user to enter 10 numbers. These numbers are read one by one and stored in the array using a for loop.
- Then the EvenCount() function is called.This function goes through the array and checks which numbers are even. It counts them and sends the count back to main(), where it is printed.
- After that, the AscendingSort() function is called.This function sorts the array in increasing order by comparing the elements and swapping them when required. The sorted array is then displayed.
- Next, the DescendingSort() function is used to sort the same array in decreasing order.It again compares and swaps the values so that bigger numbers come first. The result is printed.
- After sorting, the program removes duplicate numbers.The RemoveDuplicates() function is called and it uses another array to keep only the unique values.
- Inside this function, each element is checked. If it is not already in the new array, it is added. Duplicate values are skipped.
- The unique elements are copied back to the original array and the new size of the array is updated.
- Finally, the array after removing duplicates is printed on the screen.
- The program ends after displaying all the results.

PROGRAM:

```
/*
*   Program to demonstrate Array operations
*   Author    : MUTHUGANESH S
*   Date      : 12/01/2026
*   Filename : ArrayProgram.c
*   retval    : void
*/

//header file
#include <stdio.h>
#define SIZE 10

//function declaration
int EvenCount(int Array[]);
void AscendingSort(int Array[]);
void DescendingSort(int Array[]);
void RemoveDuplicates(int Array[], int *NewSize);

//main function
int main(){
    int Array[SIZE];

    //Get input from user
    printf("Enter %d integers:\n", SIZE);
    for(int i=0;i<SIZE;i++){
        scanf("%d", &Array[i]);
    }
    //Count even numbers in the array
    int EvenNumbers = EvenCount(Array);
    printf("\nNumber of even numbers in the array: %d\n", EvenNumbers);

    //Sort the array in ascending order
    AscendingSort(Array);
    printf("\nArray in ascending order: ");
    for(int i=0;i<SIZE;i++){
        printf("%d ", Array[i]);
    }
    printf("\n");

    //Sort the array in descending order
    DescendingSort(Array);
    printf("\nArray in descending order: ");
    for(int i=0;i<SIZE;i++){
        printf("%d ", Array[i]);
    }
    printf("\n");

    //Remove duplicates from the array
    int NewSize = SIZE;

    //Function call to remove duplicates
    RemoveDuplicates(Array, &NewSize);
    printf("\nArray after removing duplicates: ");

    //Display the new array
    for(int i=0;i<NewSize;i++){
        printf("%d ", Array[i]);
    }
    printf("\n");

    return 0;
}

//Function to count even numbers in the array
int EvenCount(int Array[]){
    int Count=0;

    for(int i=0;i<SIZE;i++){
        if(Array[i]%2==0){
            Count++;
        }
    }
    return Count;
}

//Function to sort the array in ascending order
void AscendingSort(int Array[]){
    int SwapVariable;

    for(int i=0;i<SIZE-1;i++){
        for(int j=i+1;j<SIZE;j++){
            if(Array[i]>Array[j]){

                //Swap the elements
                SwapVariable = Array[i];
                Array[i] = Array[j];
                Array[j] = SwapVariable;
            }
        }
    }
}

//Function to sort the array in descending order
void DescendingSort(int Array[]){
    int SwapVariable;

    for(int i=0;i<SIZE-1;i++){
        for(int j=i+1;j<SIZE;j++){
            if(Array[i]<Array[j]){

                //Swap the elements
                SwapVariable = Array[i];
                Array[i] = Array[j];
                Array[j] = SwapVariable;
            }
        }
    }
}

//remove the duplicate elements from the array
void RemoveDuplicates(int Array[], int *NewSize){
    //Create a new array to store unique elements
    int NewArray[SIZE];
    int Index = 0;

    //Check for duplicates and store unique elements
    for(int i=0;i<SIZE;i++){

        int IsDuplicate = 0; //Flag to check for duplicates

        for(int j=0;j<Index;j++){
            if(Array[i] == NewArray[j]){
                IsDuplicate = 1;
                break;
            }
        }
        if(!IsDuplicate){
            NewArray[Index++] = Array[i];
        }
    }

    //Copy unique elements back to original array
    for(int i=0;i<Index;i++){
        Array[i] = NewArray[i];
    }

    //Update the new size of the array
    *NewSize = Index;
}
```

OUTPUT:



```
Microsoft Windows [Version 10.0.26200.6899]
(c) Microsoft Corporation. All rights reserved.

M:\training\ARRAY>gcc ArrayProgram.c -o ArrayProgram.exe

M:\training\ARRAY>ArrayProgram
Enter 10 integers:
1 2 3 4 5 5 4 3 2 1

Number of even numbers in the array: 4

Array in ascending order: 1 1 2 2 3 3 4 4 5 5

Array in descending order: 5 5 4 4 3 3 2 2 1 1

Array after removing duplicates: 5 4 3 2 1

M:\training\ARRAY>
```