Array Assignment

1 Write the following program :

Declare an integer array of size 100.

Assign numbers 1-100 to each element of the array.

Print all the numbers.

Print all even elements.

Print all odd elements.

Add also 5 to each element and print 6 – 105 numbers.

```
#include <stdio.h>
void main() {
   int i,arr[100];
   for(i=0;i<100;i++){
      arr[i]=i+1;
   }
   printf("all numbers (1-100):\n");
   for(i=0;i<100;i++){
      printf("%d ",arr[i]);
   }
   printf("\n");
   printf("even numbers:\n");
   for(i=0;i<100;i++){
      if(arr[i]%2==0){
         printf(" %d",arr[i]);
      }
```

```
}    printf("\n");
   printf("odd numbers:\n");
   for(i=0;i<100;i++){
      if(arr[i]%2!=0){
         printf("%d ",arr[i]);
      }

   }printf("\n");
```

Output:

all numbers (1-100):

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

even numbers:

2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100

odd numbers:

1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75 77 79 81 83 85 87 89 91 93 95 97 99

numbers after adding 5 to each element (6-100):

6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105

2 Write the following program :

Declare a character array without size.

Initialize the array with characters of your name.

Print your name using for loop.

```
#include<stdio.h>
void main() {
   char name[] = "AnilKumar";
   for (int i = 0; name[i] != '\0'; i++) {
      printf("%c", name[i]);
   }
   printf("\n");
}
```

Output: AnilKumar

3 Declare an array of size 10. Enter 10 elements and save them in the array. Print the array . Find out the biggest and smallest numbers and their indexes and print

```
#include<stdio.h>
void main(){
   int i,arr[10];
   for(i=0;i<=10;i++){
      arr[i]=i+1;
   }printf("all the numbers (1-10):\n");
   for(i=0;i<10;i++){
      printf("%d ",arr[i]);
   }
   printf("\n");
   int largest = arr[0], smallest = arr[0];
   int largestIndex = 0, smallestIndex = 0;
   for(i = 1; i < 10; i++) {
      if(arr[i] > largest) {
```

```
            largest = arr[i];
            largestIndex = i;
        }
        if(arr[i] < smallest) {
            smallest = arr[i];
            smallestIndex = i;
        }
    }
    printf("\n\nBiggest number: %d at index %d", largest, largestIndex);
    printf("\nSmallest number: %d at index %d", smallest, smallestIndex);
}
```

Output:

all the numbers (1-10):

1 2 3 4 5 6 7 8 9 10

Biggest number: 10 at index 9

Smallest number: 1 at index 0

4 Try experimenting with the below array syntaxes and see the results,check their sizes, try to also read values for elements and print them:</br>

```
int arr[5] = {};
int arr[10] = {2.4,5.6,7.3};
int arr[3] = {1,2,3,4,5};
int arr[0] = {};
int arr[0] = {1,2,3,4,5};
int arr[] = {};
int arr['a'];
```

```
#include <stdio.h>

void main() {
    int arr1[5] = {};
    printf("Experiment 1: int arr[5] = {};\n");
```

```
    printf("Size of arr1: %zu bytes\n", sizeof(arr1));
    printf("Array elements: ");
    for (int i = 0; i < 5; i++) {
        printf("%d ", arr1[i]);
    }
    printf("\n");
    printf("Experiment 2: int arr[10] = {2.4, 5.6, 7.3};\n");
    int arr2[10] = {2, 5, 7};
    printf("Size of arr2: %zu bytes\n", sizeof(arr2));
    printf("Array elements: ");
    for (int i = 0; i < 10; i++) {
        printf("%d ", arr2[i]);
    }
    printf("\n");
    printf("Experiment 3: int arr[3] = {1, 2, 3, 4, 5};\n");
    int arr3[3] = {1, 2, 3};
    printf("Size of arr3: %zu bytes\n", sizeof(arr3));
    printf("Array elements: ");
    for (int i = 0; i < 3; i++) {
        printf("%d ", arr3[i]);
    }
    printf("\n");
}
```

Output:

```
Experiment 1: int arr[5] = {};
Size of arr1: 20 bytes
```

Array elements: 0 0 0 0 0

Experiment 2: int arr[10] = {2.4, 5.6, 7.3};

Size of arr2: 40 bytes

Array elements: 2 5 7 0 0 0 0 0 0 0

Experiment 3: int arr[3] = {1, 2, 3, 4, 5};

Size of arr3: 12 bytes

Array elements: 1 2 3

5 Write the following program.
Declare an integer variable ‘size’.
Take the value of ‘size’ from user using scanf.
Declare an array of any datatype, and give the integer variable ‘size’, in place of size of the array and initialize it to some values.(syntax: float array[size] = {1.0,2.5};)
Using for loop, try to take user input using scanf. Loop should execute ‘size’ number of times.
Using for loop, print the elements of the array.

```
#include <stdio.h>

void main() {

   int size;

   printf("Enter the size of the array: ");

   scanf("%d", &size);

   float array[size];

   printf("Enter %d elements for the array:\n", size);

   for (int i = 0; i < size; i++) {

      printf("Element %d: ", i + 1);

      scanf("%f", &array[i]);

   }

   printf("The elements of the array are:\n");

   for (int i = 0; i < size; i++) {

      printf("Element %d: %.2f\n", i + 1, array[i]);

   }
```

```
}
```

Output:

Enter the size of the array: 4

Enter 4 elements for the array:

Element 1: 2.3

Element 2: 3.4

Element 3: 5.4

Element 4: 6.5

The elements of the array are:

Element 1: 2.30

Element 2: 3.40

Element 3: 5.40

Element 4: 6.50

6 Write a function to search for a specific element given by the user, in an array and display its index. Function takes array and element to search as inputs, and returns the index as output. If element not found, return -1.

```
#include <stdio.h>
int searchElement(int array[], int size, int element) {
    for (int i = 0; i < size; i++) {
        if (array[i] == element) {
            return i;
        }
    }
    return -1;
}
void main() {
    int size, element, index;
    printf("Enter the size of the array: ");
```

```
    scanf("%d", &size);
    int array[size];
    printf("Enter %d elements for the array:\n", size);
    for (int i = 0; i < size; i++) {
        printf("Element %d: ", i + 1);
        scanf("%d", &array[i]);
    }
    printf("Enter the element to search: ");
    scanf("%d", &element);
    index = searchElement(array, size, element);
    if (index != -1) {
        printf("Element %d found at index %d.\n", element, index);
    } else {
        printf("Element %d not found in the array.\n", element);
    }
}
```

Output:

```
Enter the size of the array: 5
Enter 5 elements for the array:
Element 1: 23
Element 2: 43
Element 3: 7
Element 4: 80
Element 5: 98
Enter the element to search: 80
Element 80 found at index 3.
```

7 Write a program to print an array in reverse order.

```
#include<stdio.h>
void main(){
   int size;
   printf("enter the size of array:\n");
   scanf("%d",&size);
   int array[size];
   printf("enter the %d lements:\n",size);
   for(int i=0;i<size;i++){
      scanf("%d ",&array[i]);


   }
   printf("array in revers order:\n");
   for(int i=size-1;i>=0;i--){
      printf("%d ",array[i]);
   }
}
```

Output:

```
enter the size of array:
4
enter the 4 lements:
5
4
5
6
array in revers order:
6 5 4 5
```

8 Write a program to reverse an array and print it (Reverse the array by swapping both edges of the array and move inside and repeat till middle of the array):

Input : array1 ={1,2,3,4,5};

Output : array1 = {5,4,3,2,1};

```
#include <stdio.h>

void main() {

   int array1[] = {1, 2, 3, 4, 5};

   int size = sizeof(array1) / sizeof(array1[0]);

   printf("Original array: ");

   for (int i = 0; i < size; i++) {

      printf("%d ", array1[i]);

   }

   printf("\n");

   printf("Reversed array: ");

   for (int i = 0; i < size; i++) {

      printf("%d ", array1[i]);

   }

   printf("\n");

}
```

Output:

Original array: 1 2 3 4 5

Reversed array: 1 2 3 4 5

9 Write a program to print an integer in binary format using arrays.

```
#include <stdio.h>

void main() {

    int num, binary[32], i = 0;

    printf("Enter a positive integer: ");

    scanf("%d", &num);
```

```
    while (num > 0) {
        binary[i] = num % 2;
        num = num / 2;
        i++;
    }
    printf("Binary representation: ");
    for (int j = i - 1; j >= 0; j--) {
        printf("%d", binary[j]);
    }
    printf("\n");
}
```

Output:

Enter a positive integer: 12

Binary representation: 1100

10 Write a program to swap two arrays in reverse order.

Example:

input :

array1 = {1,2,3,4,5};

array2 = {6,7,8,9,10};

output:

array1 : {10,9,8,7,6}

array2: { 5,4,3,2,1}

```
#include<stdio.h>
void main() {
    int array1[] = {1, 2, 3, 4, 5};
    int array2[] = {6, 7, 8, 9, 10};
    int size = 5; // Size of the arrays
    int temp;
    printf("Before swapping:\n");
```

```
    printf("array1: ");
    for (int i = 0; i < size; i++) {
        printf("%d ", array1[i]);
    }
    printf("\narray2: ");
    for (int i = 0; i < size; i++) {
        printf("%d ", array2[i]);
    }
    for (int i = 0; i < size; i++) {
        temp = array1[i];
        array1[i] = array2[size - 1 - i];
        array2[size - 1 - i] = temp;
    }
    printf("\n\nAfter swapping:\n");
    printf("array1: ");
    for (int i = 0; i < size; i++) {
        printf("%d ", array1[i]);
    }
    printf("\narray2: ");
    for (int i = 0; i < size; i++) {
        printf("%d ", array2[i]);
    }
}
```

Output:

Before swapping:

array1: 1 2 3 4 5

array2: 6 7 8 9 10

After swapping:

array1: 10 9 8 7 6

array2: 5 4 3 2 1

11 Write a function to return the average of marks of all students in a class.

```
#include <stdio.h>
void main() {
    int number_of_students, total_marks = 0;
    printf("Enter the number of students: ");
    scanf("%d", &number_of_students);
    int marks[number_of_students];
    for (int i = 0; i < number_of_students; i++) {
        printf("Enter marks for student %d: ", i + 1);
        scanf("%d", &marks[i]);
        total_marks += marks[i];
    }
    int average = total_marks / number_of_students;
    printf("The average marks of the class is: %d\n", average);
}
```

Output:

Enter the number of students: 5

Enter marks for student 1: 87

Enter marks for student 2: 98

Enter marks for student 3: 89

Enter marks for student 4: 99

Enter marks for student 5: 88

The average marks of the class is: 92

12 Write a function to modify the array such that all negative numbers are converted to positive.

```
#include <stdio.h>
void main() {
```

```
    int size;
    printf("Enter the size of the array: ");
    scanf("%d", &size);
    int arr[size];
    printf("Enter the elements of the array:\n");
    for (int i = 0; i < size; i++) {
        scanf("%d", &arr[i]);
    }
    for (int i = 0; i < size; i++) {
        if (arr[i] < 0) {
            arr[i] = -arr[i];
        }
    }
    printf("Modified array (negatives converted to positives):\n");
    for (int i = 0; i < size; i++) {
        printf("%d ", arr[i]);
    }
    printf("\n");
}
```

Output:

Enter the size of the array: 5

Enter the elements of the array:

-43

-10

-50

-60

-40

Modified array (negatives converted to positives):

43 10 50 60 40

13) write a function to take 2 arrays as input and return 1 if they are equal and 0 if they are not equal (sizes to be sent as seperate arguments)

```
#include <stdio.h>

int main(){

   int size1, size2;

    printf("Enter the size of the first array: ");

    scanf("%d", &size1);

    int arr1[size1];

    printf("Enter the elements of the first array:\n");

    for (int i = 0; i < size1; i++) {

        scanf("%d", &arr1[i]);

    }

    printf("Enter the size of the second array: ");

    scanf("%d", &size2);

    int arr2[size2];

    printf("Enter the elements of the second array:\n");

    for (int i = 0; i < size2; i++) {

        scanf("%d", &arr2[i]);

    }

    if(size1!=size2){

        printf("the arrays are not equal");

        return 0;

    }

    for(int i=0;i<size1;i++){

        if(arr1[i]!=arr2[i]){

            printf("arrays are not equal");


        }

    }
```

```
    printf("the arrays are equal");
    return 0;
}
```

Output:

Enter the size of the first array: 2

Enter the elements of the first array:

3

4

Enter the size of the second array: 2

Enter the elements of the second array:

3

4

the arrays are equal

14) write a function to take an array as input, and count how many times the biggest number is repeated in that array, and return the count.

eg., array : {10, 14,16,10, 10 , 16, 14, 14, 16, 16};
output : biggest number is repeated 4 times

```
#include <stdio.h>

void main() {
   int size;
   printf("Enter the size of the array: ");
   scanf("%d", &size);
   int arr[size];
   printf("Enter the elements of the array:\n");
   for (int i = 0; i < size; i++) {
      scanf("%d", &arr[i]);
   }
   int biggest = arr[0];
```

```
    for (int i = 1; i < size; i++) {
        if (arr[i] > biggest) {
            biggest = arr[i];
        }
    }
    int count = 0;
    for (int i = 0; i < size; i++) {
        if (arr[i] == biggest) {
            count++;
        }
    }
    printf("The biggest number is repeated %d times.\n", count);
}
```

Output:Enter the size of the array: 10

Enter the elements of the array:

2

8

2

4

2

5

8

2

9

2

The biggest number is repeated 1 times.