Name - Abhay kaushal

Section - AY

Branch - CS

University roll 2315000022

C- Programming Language

Week – 5
Programming Questions

Q. 1 Write a program to print the following patterns:

a.
```
*****
*****
*****
*****
```
Sol.

```
#include <stdio.h>

int main() {
    int i, j;
    for(i = 0; i < 4; i++) {
        for(j = 0; j < 5; j++) {
            printf("*");
```

```
        }
        printf("\n");
    }
    return 0;
}
```

```
Compile Result

*****
*****
*****
*****

[Process completed - press Enter]
```

b. 12345 12345
12345
12345
12345

Sol.
```
#include
<stdio.h>

int main() {
    int i, j;
    for(i = 1; i <= 4; i++) {
        for(j = 1; j <= 5; j++) {
        printf("%d", j); }
        printf("\n");
    }

    return 0;
}
```

```
Compile Result

12345
12345
12345
12345

[Process completed - press Enter]
```

c. 1
12
123
1234

Sol.
```
#include
<stdio.h>
```

```
int main() {
   int i, j;

   for(i = 1; i <= 4; i++) {
      for(j = 1; j <= i; j++) {
      printf("%d", j); }
      printf("\n");
   }

   return 0;
}
```

d. 1
22
333
4444

Sol.
```
#include
<stdio.h>

int main() {
   int i, j;

   for(i = 1; i <= 4; i++) {
      for(j = 1; j <= i; j++) {
      printf("%d", i); }
      printf("\n");
   }

   return 0;
}
```

e. *
**
***
**** Sol. #include
<stdio.h>

```
int main() {
   int i, j;

   for(i = 1; i <= 4; i++) {
      for(j = 1; j <= i; j++) {
      printf("*"); }
      printf("\n");
   }
   return 0;
}
```

f. A
AB
ABC
ABCD
Sol. #include
<stdio.h>

```
int main() {
   int i, j, k;

   for(i = 1; i <= 4; i++) {
      for(j = 4; j > i; j--) {
         printf(" ");
      }
      for(k = 1; k <= i; k++) {
          printf("%c", 'A' + k - 1);
      }
      printf("\n");
   }
```

```
    return 0;
}
```

```
Compile Result

   A
  AB
 ABC
ABCD

[Process completed - press Enter]
```

g. 1
2 3
4 5 6
7 8 9 10
Sol.

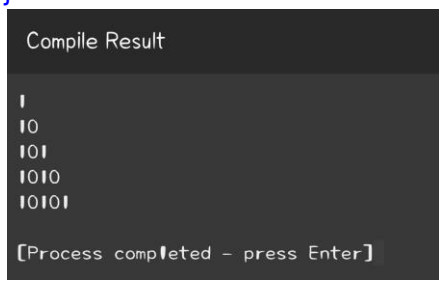
```
#include <stdio.h>
int main() {
    int i, j, num = 1;

    for(i = 1; i <= 4; i++) {
        for(j = 1; j <= i; j++) {
            printf("%d ", num);
            num++;
        }
        printf("\n");
    }

    return 0;
}
```

```
Compile Result

1
2 3
4 5 6
7 8 9 10

[Process completed - press Enter]
```

h. 1
10
101
1010
10101
Sol.

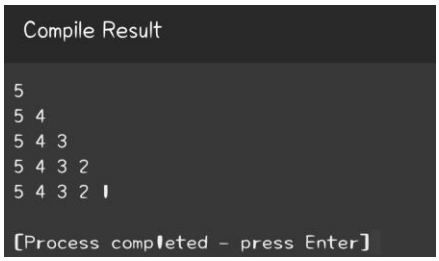
```
#include
<stdio.h>
```

```
int main() {
   int i, j;

   for(i = 1; i <= 5; i++) {
      for(j = 1; j <= i; j++) {
      if(j % 2 != 0) {
      printf("1");
          } else {
             printf("0");
          } }
      printf("\n");
   }
   return 0;
}
```



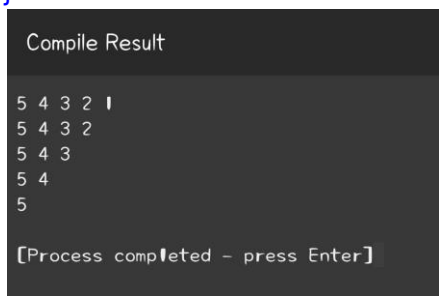
i. 5
5 4
5 4 3
5 4 3 2
5 4 3 2 1
Sol. #include
<stdio.h>

```
int main() {
   int i, j;

   for(i = 5; i >= 1; i--) {
      for(j = 5; j >= i; j--) {
         printf("%d ", j);
      }
      printf("\n");
   }

   return 0;
}
```



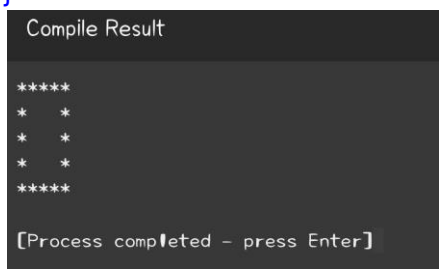
j. 5 4 3 2 1
5 4 3 2
5 4 3
5 4
5
Sol.

```
#include <stdio.h>

int main() {
    int i, j;

    for(i = 5; i >= 1; i--) { for(j
        = 5; j >= 6 - i; j--) {
            printf("%d ", j);
        }
        printf("\n");
    }

    return 0;
}
```



k. *****
* *
* *
* *
***** Sol. #include
<stdio.h>

```
int main() {
    int i, j;

    for(i = 1; i <= 5; i++) {
        for(j = 1; j <= 5; j++) {
            if(i == 1 || i == 5 || j == 1 || j == 5) {
                printf("*");
            } else {
                printf(" ");
            } }
        printf("\n");
    }
    return 0;
}
```



I. .
```
*
**
***
****
*****
```

Sol.
```
#include <stdio.h>

int main() {
    int rows = 5;

    for (int i = 1; i <= rows; i++) { // Spaces for (int
        space = 1; space <= rows - i; space++) { printf("
        ");
        }

        // Stars for (int j = 1; j <=
        i; j++) { printf("*"); }

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

```
    return 0;
}
```

Compile Result

```
    *
   **
  ***
 ****
*****

[Process completed - press Enter]
```

m.

```
    *
   **
  ***
 ****
*****
 ****
  ***
   **
    *
```

Sol.

```
#include <stdio.h>

int main() {
    int rows = 5;

    // Upper part of the pattern
    for (int i = 1; i <= rows; i++) {
        for (int j = 1; j <= i; j++) {
        printf("*"); } printf("\n");
    }

    // Lower part of the pattern for
    (int i = rows - 1; i >= 1; i--) {
        for (int j = 1; j <= i; j++) {
        printf("*"); } printf("\n");
    }

    return 0;
}
```

```
*
**
***
****
*****
****
***
**
*

[Process completed - press Enter]
```

n. 6 7 8 9
3 4 5
1 2
0

Sol.
```
#include <stdio.h>

int main() {
   int i, j, k = 6;

   for(i = 1; i <= 4; i++) {
      for(j = 1; j < i; j++) {
      printf(" ");
      }
      for(j = i; j <= 4; j++) {
         printf("%d ", k);
         k++;
      }
      k = k - 2*(i+1) + 1;
      printf("\n");
   }

   return 0;
}
```

```
Compile Result

6 7 8 9
  7 8 9
    5 6
      0

[Process completed - press Enter]
```

C- Programming Language

Programming Question

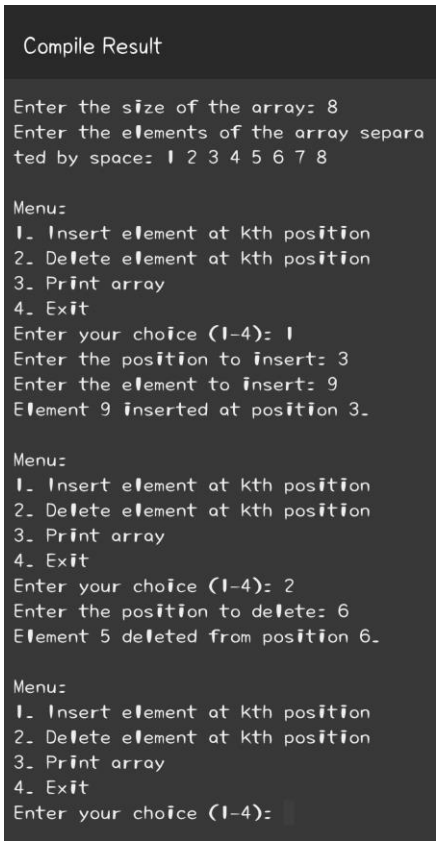
Week - 6

Q. 1 Write a menu driven program to insert and delete elements of kth position to an array of size N.

Sol.-

```
#include <stdio.h>

void insertElement(int arr[], int *n, int k, int element) {
    if (k < 1 || k > (*n) + 1) {
        printf("Invalid position for insertion.\n");
    } else { (*n)++; for (int i =
        *n; i > k; i--) { arr[i - 1] =
        arr[i - 2];
        }
        arr[k - 1] = element; printf("Element %d inserted at position
        %d.\n", element, k);
    }
}

void deleteElement(int arr[], int *n, int k) {
    if (k < 1 || k > *n) {
        printf("Invalid position for deletion.\n");
    } else { int deletedElement = arr[k
        - 1]; for (int i = k - 1; i < *n - 1;
        i++) { arr[i] = arr[i + 1];
        }
        (*n)--;
        printf("Element %d deleted from position %d.\n", deletedElement, k);
    }
}

void printArray(int arr[], int n) {
    printf("Current array: "); for
    (int i = 0; i < n; i++) {
    printf("%d ", arr[i]);
    }
    printf("\n");
}

int main() {
    int N; printf("Enter the size of the
    array: "); scanf("%d", &N);
```

```
    int array[N]; printf("Enter the elements of the array separated
    by space: "); for (int i = 0; i < N; i++) {
        scanf("%d", &array[i]);
    }

    while (1) {
        printf("\nMenu:\n"); printf("1. Insert element
        at kth position\n"); printf("2. Delete element
        at kth position\n"); printf("3. Print array\n");
        printf("4. Exit\n");

        int choice;
        printf("Enter your choice (1-4): ");
        scanf("%d", &choice);

        int k, element;
        switch (choice) {
            case 1:
                printf("Enter the position to insert: ");
                scanf("%d", &k); printf("Enter the
                element to insert: "); scanf("%d",
                &element); insertElement(array, &N,
                k, element); break;
            case 2:
                printf("Enter the position to delete: ");
                scanf("%d", &k);
                deleteElement(array, &N, k); break;
            case 3:
                printArray(array, N);
                break;
            case 4:
                printf("Exiting program.\n");
                return 0;
            default:
                 printf("Invalid choice. Please enter a number between 1 and 4.\n");
        }
    }

    return 0;
}
```



Q. 2 Write the program to print the biggest and smallest element in an array. Sol.-

```
#include <stdio.h>

int main() {
   int array[100], n, i, smallest, largest;

   printf("Enter the number of elements in array\n");
   scanf("%d", &n); printf("Enter %d integers\n", n);

   for (i = 0; i < n; i++)
      scanf("%d", &array[i]);
   smallest = largest = array[0];

   for (i = 1; i < n; i++) {
      if (array[i] > largest)
         largest = array[i];
      else if (array[i] < smallest)
         smallest = array[i];
   }
```

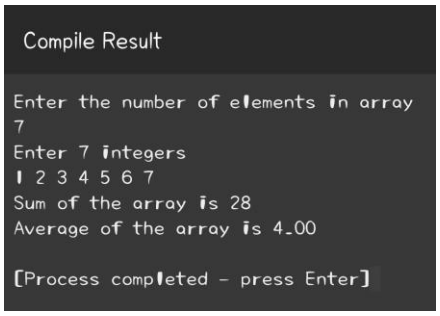
```
    printf("Largest in the array is %d\n", largest); printf("Smallest
    in the array is %d\n", smallest);

    return 0;
}
```

```
Compile Result

Enter the number of elements in array
8
Enter 8 integers
1 2 3 4 5 6 7 8
Largest in the array is 8
Smallest in the array is 1

[Process completed - press Enter]
```

Q. 3 Write the program to print the sum and average of an array.

Sol.-

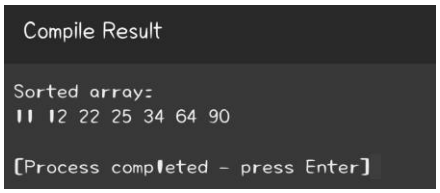
```
#include <stdio.h>

int main() {
    int n, i, sum = 0; float
    average;

    printf("Enter the number of elements in array\n"); scanf("%d",
    &n);

    int array[n]; printf("Enter %d
    integers\n", n);

    for (i = 0; i < n; i++) {
        scanf("%d", &array[i]); sum
        += array[i];
    }

    average = (float)sum/n; printf("Sum of

    the array is %d\n", sum);

    printf("Average of the array is %.2f\n",

    average);


    return 0;
}
```



Q. 4 Write the program to sort an array using bubble sort.

Sol.-

```
#include <stdio.h>

void swap(int *xp, int *yp) {
   int temp = *xp; *xp
   = *yp;
   *yp = temp;
}

void bubbleSort(int arr[], int n) {
  for(int i = 0; i < n-1; i++) { for
  (int j = 0; j < n-i-1; j++) { if
  (arr[j] > arr[j+1])
            swap(&arr[j], &arr[j+1]);
     }
   }
}

void printArray(int arr[], int size) {
   for (int i=0; i < size; i++)
      printf("%d ", arr[i]);
   printf("\n");
}

int main() {
   int arr[] = {64, 34, 25, 12, 22, 11, 90};
   int n = sizeof(arr)/sizeof(arr[0]);
   bubbleSort(arr, n); printf("Sorted
   array: \n"); printArray(arr, n);
   return 0;
}
```



Q. 5 Write the program to search an element using linear search as well as binary search.

Sol.-

```
// Linear Search
#include <stdio.h>

int linearSearch(int array[], int n, int x) {
   for(int i = 0; i < n; i++)
     if(array[i] == x)
       return i;
   return -1;
}

// Binary Search
int binarySearch(int array[], int low, int high, int x) {
   if (high >= low) {
     int mid = low + (high - low) / 2;

     if (array[mid] == x)
       return mid;

     if (array[mid] > x)
       return binarySearch(array, low, mid - 1, x);

     return binarySearch(array, mid + 1, high, x);
   }

   return -1;
}

int main() { int array[] = {2, 3,
  4, 10, 40}; int x = 10;

   // Using Linear Search
   int result = linearSearch(array, 5, x);
   (result == -1) ? printf("Element is not present in array\n")
                  : printf("Element is present at index %d\n", result);
```

```
    // Using Binary Search
    int result2 = binarySearch(array, 0, 4, x);
    (result2 == -1) ? printf("Element is not present in array\n")
                    : printf("Element is present at index %d\n", result2);
    return 0;
}
```

```
Compile Result

Element is present at index 3
Element is present at index 3

[Process completed - press Enter]
```

Q. 6 Take an array of 20 integer inputs from user and print the following:

a.number of positive numbers

b.number of negative numbers

c.number of odd numbers

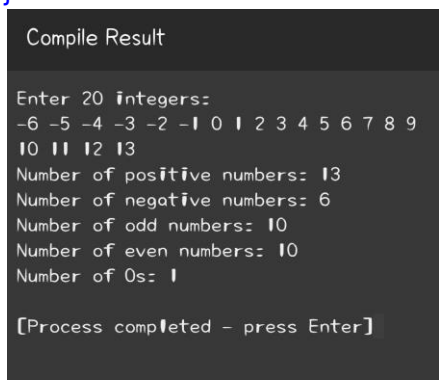
d.number of even numbers

e.number of 0.

Sol.-

```
#include <stdio.h>

int main() {
    int array[20];
    int pos = 0, neg = 0, odd = 0, even = 0, zero = 0;

    printf("Enter 20 integers:\n");

    for(int i = 0; i < 20; i++) {
        scanf("%d", &array[i]);

        // Check positive/negative/zero
        if (array[i] > 0) pos++; else if
        (array[i] < 0) neg++; else
        zero++;
```

```
        // Check odd/even if (array[i]
        % 2 == 0) even++; else
        odd++;
    }

    printf("Number of positive numbers: %d\n", pos);
    printf("Number of negative numbers: %d\n", neg);
    printf("Number of odd numbers: %d\n", odd); printf("Number
    of even numbers: %d\n", even); printf("Number of 0s:
    %d\n", zero);

    return 0;
}
```



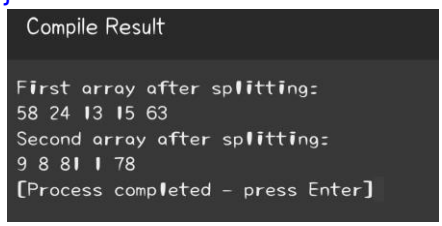
7 Take an array of 10 elements. Split it into middle and store the elements in two different arrays. E.g.INITIAL array:

58, 24, 13, 15, 63, 9, 8, 81, 1, 78
After splitting:

58, 24, 13, 15, 63 9, 8, 81, 1, 78
Sol.-

```
#include <stdio.h>

int main() {
    int array[10] = {58, 24, 13, 15, 63, 9, 8, 81, 1, 78}; int
    array1[5], array2[5];

    // Split the array for(int i
    = 0; i < 5; i++) {
    array1[i] = array[i];
    array2[i] = array[i+5];
    }
```

```
    // Print the split arrays printf("First
    array after splitting: \n"); for(int i = 0;
    i < 5; i++) {
        printf("%d ", array1[i]);
    }

    printf("\nSecond array after splitting: \n"); for(int
    i = 0; i < 5; i++) {
        printf("%d ", array2[i]);
    }

    return 0;
}
```

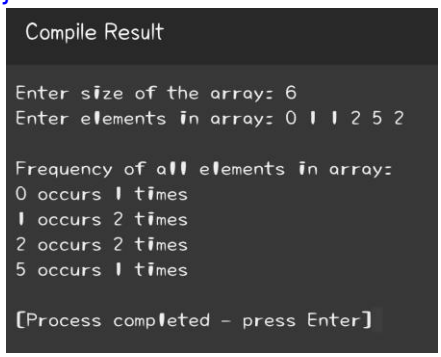


8 Write the program to count frequency of each element in an array.

Sol.-

```
#include <stdio.h>

int main() {
    int array[100], freq[100]; int
    size, i, j, count;

    printf("Enter size of the array: "); scanf("%d",
    &size);

    printf("Enter elements in array: "); for(i
    = 0; i < size; i++) {
        scanf("%d", &array[i]);
        freq[i] = -1;
    }

    for(i = 0; i < size; i++){
        count = 1; for(j = i + 1; j <
        size; j++){ if(array[i] ==
        array[j]){
                count++;
                freq[j] = 0;
```

```
            }
        }

        if(freq[i] != 0){
            freq[i] = count;
        }
    }

    printf("\nFrequency of all elements in array: \n");
    for(i = 0; i < size; i++){ if(freq[i] != 0){
            printf("%d occurs %d times\n", array[i], freq[i]);
        }
    }

    return 0;
}
```



C- Programming Language

Week – 7

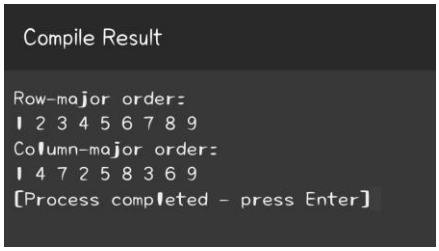
Programming Questions

Q. 1 Write the program to print row major and column major matrix.

Sol.-

```
#include <stdio.h>

int main() {
    int array[3][3] = {{1, 2, 3},
                       {4, 5, 6},
                       {7, 8, 9}};
    int i, j;
```

```
    // Print in row-major order
    printf("Row-major order: \n"); for
    (i = 0; i < 3; i++) {
        for (j = 0; j < 3; j++) {
            printf("%d ", array[i][j]);
        } }
    printf("\n");

    // Print in column-major order
    printf("Column-major order: \n"); for
    (i = 0; i < 3; i++) {
        for (j = 0; j < 3; j++) {
            printf("%d ", array[j][i]);
        }
    }

    return 0;
}
```



Q. 2 Write the program to print sum of a whole matrix.

Sol.-

```
#include <stdio.h>

int main(){
    int i, j, rows, columns, sum = 0;
    int matrix[10][10];

    printf("Enter the number of rows and columns of the matrix: ");

    scanf("%d%d", &rows, &columns); printf("\nEnter elements of

    the matrix: \n");

    for (i = 0; i < rows; i++){
      for (j = 0; j < columns; j++){
        scanf("%d", &matrix[i][j]);
        sum = sum + matrix[i][j];
```

```
    }
  }

  printf("\nThe sum of all elements of the matrix is: %d", sum);
  return 0;
}
```

```
Compile Result

Enter the number of rows and columns o
f the matrix: 2 2

Enter elements of the matrix:
1 2 3 4

The sum of all elements of the matrix
is: 10
[Process completed - press Enter]
```

Q. 3 Write a program to add and multiply two 3x3 matrices. You can use 2D array to create a matrix.

Sol.-

```
#include <stdio.h>
int main() {
  int a[3][3] = {{1, 2, 3},
                 {4, 5, 6},
                 {7, 8, 9}}; int
  b[3][3] = {{10, 11, 12},
                 {13, 14, 15},
                 {16, 17, 18}}; int
  sum[3][3], product[3][3]; int
  i, j, k;

  // Add matrices for
  (i=0; i<3; i++) {
     for (j=0; j<3; j++) {
        sum[i][j] = a[i][j] + b[i][j];
     }
  }

  // Multiply matrices for
  (i=0; i<3; i++) { for (j=0;
  j<3; j++) { product[i][j] =
  0; for (k=0; k<3; k++) {
            product[i][j] = product[i][j] + a[i][k] * b[k][j];
        }
     }
```

```
    }

    // Print sum matrix printf("Sum
    of matrices: \n"); for (i=0; i<3;
    i++) {
        for (j=0; j<3; j++) {
            printf("%d ", sum[i][j]);
        }
        printf("\n");
    }

    // Print product matrix
    printf("Product of matrices: \n"); for
    (i=0; i<3; i++) {
        for (j=0; j<3; j++) {
            printf("%d ", product[i][j]);
        }
        printf("\n");
        }

    return 0;
}
```

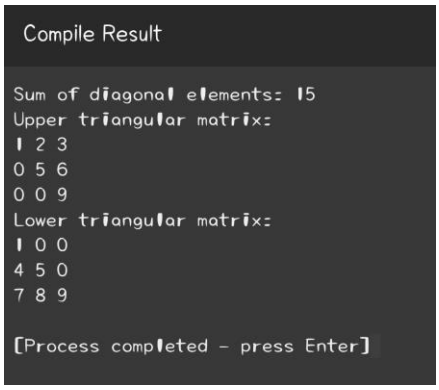
```
Compile Result

Sum of matrices:
11 13 15
17 19 21
23 25 27
Product of matrices:
84 90 96
201 216 231
318 342 366

[Process completed - press Enter]
```

Q. 4 Write the program to print sum of all diagonal elements, upper triangular matrix and lower triangular matrix.

Sol.-

```
#include <stdio.h>

int main() { int matrix[3][3] =
    {{1, 2, 3},
                    {4, 5, 6},
                    {7, 8, 9}};
    int i, j, sum = 0;
```

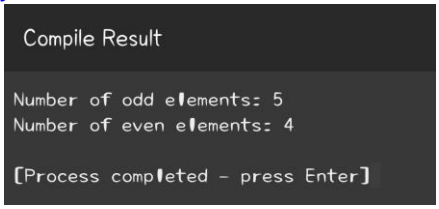
```
    // Sum of diagonal elements
    for(i=0; i<3; i++) { for(j=0;
    j<3; j++) { if(i == j) {
                sum = sum + matrix[i][j];
            }
        }
    }
    printf("Sum of diagonal elements: %d\n", sum);

    // Print upper triangular matrix
    printf("Upper triangular matrix: \n");
    for(i=0; i<3; i++) { for(j=0; j<3; j++) {
    if(i <= j) { printf("%d ", matrix[i][j]);
            } else {
                printf("0 ");
            }
        }
        printf("\n");
    }

    // Print lower triangular matrix
    printf("Lower triangular matrix: \n"); for(i=0;
    i<3; i++) {
        for(j=0; j<3; j++) {
            if(i >= j) { printf("%d ",
                matrix[i][j]);
            } else {
                printf("0 ");
            }
        }
        printf("\n");
    }

    return 0;
}
```



Q. 5 Write the program to find the frequency of odd and even elements in matrix.

Sol.-

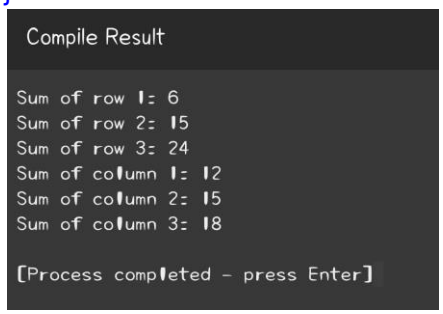
```
#include <stdio.h>

int main() {
   int matrix[3][3] = {{1, 2, 3},
                       {4, 5, 6},
                       {7, 8, 9}}; int i, j,
   oddCount = 0, evenCount = 0;

   // Count odd and even numbers
   for(i=0; i<3; i++) {
      for(j=0; j<3; j++) {
         if(matrix[i][j] % 2 == 0) {
            evenCount++;
         } else {
            oddCount++;
         }
      }
   }

   printf("Number of odd elements: %d\n", oddCount);
   printf("Number of even elements: %d\n", evenCount);

   return 0;
}
```



Q. 6 Write the program to find sum of each row and sum of each column of matrix.

Sol.-

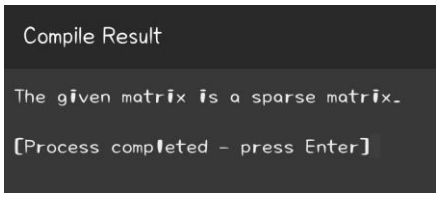
```
#include <stdio.h>

int main() {
   int matrix[3][3] = {{1, 2, 3},
                       {4, 5, 6},
                       {7, 8, 9}}; int
   i, j, rowSum, colSum;

   // Sum of each row
   for(i=0; i<3; i++) { rowSum
      = 0;
      for(j=0; j<3; j++) {
         rowSum += matrix[i][j];
      }
      printf("Sum of row %d: %d\n", i+1, rowSum);
   }

   // Sum of each column
   for(i=0; i<3; i++) { colSum
      = 0;
      for(j=0; j<3; j++) {
         colSum += matrix[j][i];
      }
       printf("Sum of column %d: %d\n", i+1, colSum);
   }

   return 0;
}
```



Q. 7 Initialize a 2D array of 3*3 matrix. E.g.-

```
    int matrix[3][3] = {{1,0,0}, {0,2,0}, {0,0,3}};
    int i, j, diagonal = 1, upper = 1, lower = 1;

    for(i = 0; i < 3; i++){
      for(j = 0; j < 3; j++){

        if(i == j && matrix[i][j] == 0){
          diagonal = 0;
        }

        if(i > j && matrix[i][j] != 0){
          upper = 0;
        }

        if(i < j && matrix[i][j] != 0){
          lower = 0;
        }

      }
    }

    if(diagonal == 1){
      printf("The matrix is a Diagonal matrix.\n");
    }
    else if(upper == 1){
      printf("The matrix is an Upper triangular matrix.\n");
    }
    else if(lower == 1){
      printf("The matrix is a Lower triangular matrix.\n");
    }
    else{
      printf("The matrix is not a special matrix.\n");
    }

    return 0;
}
```

```
Compile Result

The matrix is a Diagonal matrix.

[Process completed - press Enter]
```


Compile Result
The given matrix is a sparse matrix.
[Process completed - press Enter]

C- Programming Language

Week – 8

Programming Questions

Q. 1 Write a C program to create, initialize and use pointers.

Sol.

```
#include<stdio.h>

int main() {
   int num = 10; // Declare and initialize an integer int

   *ptr; // Declare an integer pointer ptr = &num; //

   Initialize pointer with address of num printf("Value

   of num: %d\n", num); printf("Address of num:

   %p\n", &num); printf("Value of pointer ptr: %p\n",

   ptr); printf("Value pointed to by ptr: %d\n", *ptr);

   return 0;
}
```

```
Compile Result

Value of num: 10
Address of num: 0x7ffbl69598
Value of pointer ptr: 0x7ffbl69598
Value pointed to by ptr: 10

[Process completed - press Enter]
```

Q. 2 Write a C program to add two numbers using pointers.

Sol.

```
#include<stdio.h>

int main() {
   int num1 = 5, num2 = 15, sum;
   int *ptr1, *ptr2;
```

```
    ptr1 = &num1; // Pointer to num1 ptr2

    = &num2; // Pointer to num2 sum =

    *ptr1 + *ptr2; // Add two numbers

    printf("Sum = %d", sum);

    return 0;
}
```

```
Compile Result

Sum = 20
[Process completed - press Enter]
```

Q. 3 Write a C program to swap two numbers using pointers.

Sol.-

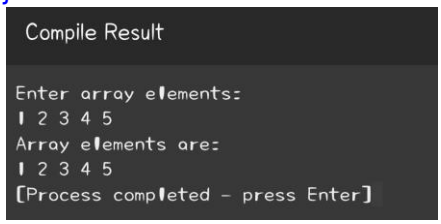
```
#include <stdio.h>

void swap(int* n1, int* n2) {
    int temp;
    temp = *n1;
    *n1 = *n2;
    *n2 = temp;
}

int main() {
    int num1 = 10, num2 = 20;

    printf("Before swapping: num1 = %d, num2 = %d\n", num1,
    num2); swap(&num1, &num2); printf("After swapping: num1 =
    %d, num2 = %d\n", num1, num2);

    return 0;
}
```

```
Compile Result

Before swapping: num1 = 10, num2 = 20
After swapping: num1 = 20, num2 = 10

[Process completed - press Enter]
```

Q. 4 Write a C program to input and print array elements using pointer.

Sol.-

```c
#include <stdio.h>

int main() {
   int arr[5]; int *ptr = arr; // Pointer to
   the array
   int i;

   printf("Enter array elements: \n");
   for(i = 0; i < 5; i++) {
      scanf("%d", ptr);
      ptr++;
   }

   ptr = arr; // Reset pointer to start of array

   printf("Array elements are: \n");
   for(i = 0; i < 5; i++) { printf("%d
   ", *ptr); ptr++;
   }

   return 0;
}
```

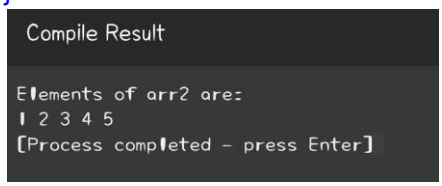


Q. 5 Write a C program to copy one array to another using pointer.

Sol.-

```c
#include <stdio.h>

int main() { int arr1[5] = {1,
   2, 3, 4, 5}; int arr2[5]; int
   *ptr1 = arr1; int *ptr2 =
   arr2;
   int i;

   // Copy arr1 to arr2
   for(i = 0; i < 5; i++) {
      *(ptr2 + i) = *(ptr1 + i);
   }
```

```
    // Print arr2 elements
    printf("Elements of arr2 are: \n");
    for(i = 0; i < 5; i++) {
        printf("%d ", *(ptr2 + i));
    }

    return 0;
}
```

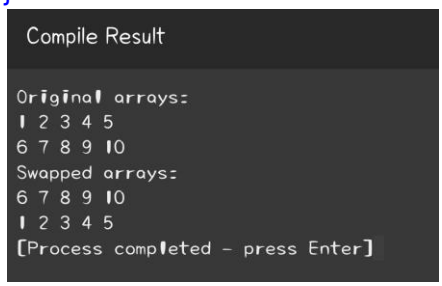


Q. 6 Write a C program to swap two arrays using pointers.

Sol.-

```
#include <stdio.h>

void swap_arrays(int *arr1, int *arr2, int n) {
    int i, temp;

    for (i = 0; i < n; i++) {
        temp = *(arr1 + i);
        *(arr1 + i) = *(arr2 + i);
        *(arr2 + i) = temp;
    }
}

int main() {
    int arr1[] = {1, 2, 3, 4, 5}; int arr2[]
    = {6, 7, 8, 9, 10}; int n =
    sizeof(arr1) / sizeof(arr1[0]); int i;

    printf("Original arrays:\n"); for (i = 0; i <
    n; i++) printf("%d ", arr1[i]);
    printf("\n");
    for (i = 0; i < n; i++) printf("%d ", arr2[i]);
    printf("\n");

    swap_arrays(arr1, arr2, n);
    printf("Swapped arrays:\n"); for (i = 0; i
    < n; i++) printf("%d ", arr1[i]);
    printf("\n");
```

```
    for (i = 0; i < n; i++) printf("%d ", arr2[i]);

    return 0;
}
```

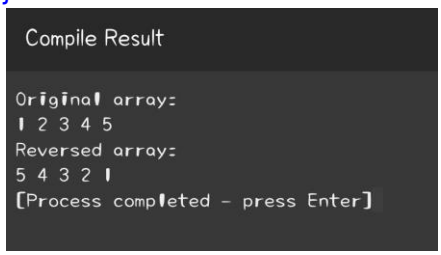


Q. 7 Write a C program to reverse an array using pointers.

Sol.-

```
#include <stdio.h>

void reverse_array(int *arr, int n) {
    int *start_ptr = arr; int
    *end_ptr = arr + n - 1; int
    temp;

    while (end_ptr > start_ptr) {
        temp = *start_ptr;
        *start_ptr = *end_ptr;
        *end_ptr = temp;
        start_ptr++; end_ptr--;
    }
}

int main() {
    int arr[] = {1, 2, 3, 4, 5}; int n =
    sizeof(arr) / sizeof(arr[0]); int i;

    printf("Original array:\n");
    for (i = 0; i < n; i++) {
    printf("%d ", arr[i]);
    }

    reverse_array(arr, n);
    printf("\nReversed array:\n");
    for (i = 0; i < n; i++) {
    printf("%d ", arr[i]);
    }
```

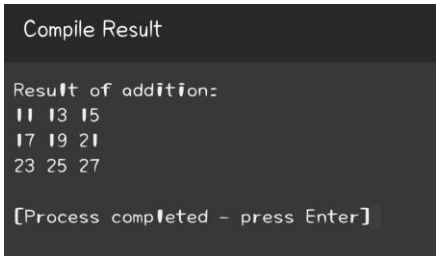
```
    return 0;
}
```



Q. 8 Write a C program to add two matrix using pointers.

Sol.-

```
#include <stdio.h> #define SIZE 3

// Size of the matrix

void add_matrices(int *m1, int *m2, int *result, int size) {
    int i;
    for (i = 0; i < size * size; i++) {
        *(result + i) = *(m1 + i) + *(m2 + i);
    }
}

int main() {
    int m1[SIZE][SIZE] = {{1, 2, 3}, {4, 5, 6}, {7, 8, 9}}; int
    m2[SIZE][SIZE] = {{10, 11, 12}, {13, 14, 15}, {16, 17, 18}}; int
    result[SIZE][SIZE]; int i, j; add_matrices((int *)m1, (int *)m2,
    (int *)result, SIZE);

    printf("Result of addition:\n");
    for (i = 0; i < SIZE; i++) { for
    (j = 0; j < SIZE; j++) {
            printf("%d ", result[i][j]);
        }
        printf("\n");
    }
    return 0;
}
```



Q. 9 Write a C program to multiply two matrix using pointers.

Sol.-

```
#include <stdio.h>

#define SIZE 3 // Size of the matrices

void multiply_matrices(int *m1, int *m2, int *result, int size) {
    int i, j, k; for (i = 0; i <
    size; i++) {
        for (j = 0; j < size; j++) {
            *(result + i*size + j) = 0;
            for (k = 0; k < size; k++) {
                *(result + i*size + j) += *(m1 + i*size + k) * *(m2 + k*size + j);
            }
        }
    }
}

int main() {
    int m1[SIZE][SIZE] = {{1, 2, 3}, {4, 5, 6}, {7, 8, 9}}; int
    m2[SIZE][SIZE] = {{10, 11, 12}, {13, 14, 15}, {16, 17, 18}}; int
    result[SIZE][SIZE]; int i, j; multiply_matrices((int *)m1, (int
    *)m2, (int *)result, SIZE);

    printf("Result of multiplication:\n");
    for (i = 0; i < SIZE; i++) {
        for (j = 0; j < SIZE; j++) {
            printf("%d ", result[i][j]);
        }
        printf("\n");
    }
    return 0;
}
```

Compile Result

```
Result of multiplication:
84 90 96
201 216 231
318 342 366

[Process completed - press Enter]
```

C- Programming Language

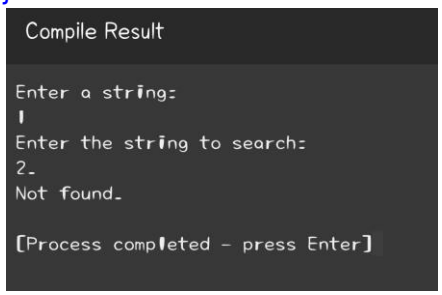
Week – 9

Programming Questions

Q. 1 Write a C program to Search string.

Sol.-

```
#include <stdio.h>
#include <string.h>

int main() { char string[100],
    search[50]; int position;

   printf("Enter a string:\n");
   gets(string);

   printf("Enter the string to search:\n");

   gets(search); char* ptr =

   strstr(string, search);

   if(ptr) {
       position = ptr - string; printf("Found at
       position: %d\n", position + 1);
   } else { printf("Not
      found.\n");
   }

   return 0;
}
```

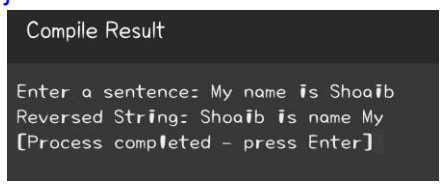


Q. 2 Write a C program to Reverse words in string.

Sol.-

```
#include <stdio.h>
#include <string.h>

void reverse(char *begin, char *end) {
   char temp;

   while (begin < end) {
      temp = *begin;
      *begin++ = *end;
      *end-- = temp;
   }
}

void reverseWords(char *sentence) {
   char *word_begin = sentence;
   char *temp = sentence;

   while (*temp) {
      temp++; if
      (*temp == '\0') {
         reverse(word_begin, temp - 1);
      } else if (*temp == ' ') {
         reverse(word_begin, temp - 1);
         word_begin = temp + 1;
      }
   }

   reverse(sentence, temp - 1);
}

int main() {
   char sentence[100];

   printf("Enter a sentence: ");

   gets(sentence);

   reverseWords(sentence);
```

```
    printf("Reversed String: %s", sentence);

    return 0;

}
```



Q. 3 Write a C program to count vowels, consonants, etc.

Sol.-

```
#include <stdio.h>

int main() {
    char
    str[100];
    int vowels = 0, consonants = 0, digits = 0, spaces = 0;
    int i = 0;

    printf("Enter a string:\n");
    gets(str);

    while(str[i] != '\0') { if((str[i] >= 'a' && str[i] <= 'z') || (str[i] >= 'A' && str[i] <= 'Z')) { if(str[i] == 'a' ||
        str[i] == 'e' || str[i] == 'i' || str[i] == 'o' || str[i] == 'u' || str[i] == 'A' || str[i] == 'E'
|| str[i] == 'I' || str[i] == 'O' || str[i] == 'U') {
                vowels++;
            } else {
                consonants++;
            }
        } else if(str[i] >= '0' && str[i] <= '9') {
            digits++;
        } else if(str[i] == ' ') {
            spaces++;
        }

        i++;
    }

    printf("Vowels: %d\n", vowels);
    printf("Consonants: %d\n", consonants);
```

```
    printf("Digits: %d\n", digits);
    printf("Spaces: %d\n", spaces);

    return 0;
}
```

```
Compile Result

Enter a string:
computer
Vowels: 3
Consonants: 5
Digits: 0
Spaces: 0

[Process completed - press Enter]
```

Q. 4 Create a program to separate characters in a given string?

Sol.-

```
#include <stdio.h>
#include <string.h>

int main() {
    char
    str[100]; int i;

    printf("Enter a string: ");
    gets(str);

    for(i = 0; str[i] != '\0'; i++) {
        printf("%c ", str[i]);
    }

    return 0;
}
```

```
Compile Result

Enter a string: computer
c o m p u t e r
[Process completed - press Enter]
```

Q. 5 Write a program to take two strings from user and concatenate them also add a space between them using strcat() function.

Sample input: **JAI**
GLA

Sample output: JAI GLA

Sol.-

```
#include <stdio.h>
#include <string.h>
int main() {
   char str1[50], str2[50];

   printf("Enter the first string: ");
   gets(str1);

   printf("Enter the second string: ");
   gets(str2);

   strcat(str1, " "); strcat(str1, str2); printf("\nThe
   concatenated string is: %s", str1);

   return 0;
}
```

```
Compile Result

Enter the first string: jai
Enter the second string: gla

The concatenated string is: jai gla
[Process completed - press Enter]
```

Q. 6 Write a C program to take a string from user and make it toggle its case i.e.

lower case to upper case and upper case to lower case.

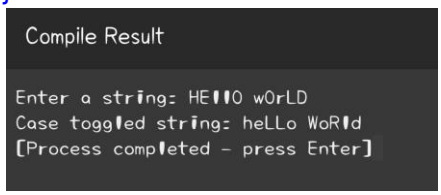
Sample Input: HEILo wOrlD

Sample output: heLIO WoRLd

Sol.-

```
#include <stdio.h>

int main() {
   char str[100];
   int i;

   printf("Enter a string: ");
   gets(str);
```

```
    for(i = 0; str[i] != '\0'; i++) {
        if(str[i] >= 'A' && str[i] <= 'Z') {
            str[i] = str[i] + 32;
        }
        else if(str[i] >= 'a' && str[i] <= 'z') {
            str[i] = str[i] - 32;
        }
    }

    printf("Case toggled string: %s", str);

    return 0;
}
```



Q. 7 Write a C program to take two strings as input from user and check they are identical or not without using string functions.

Sample input: **Jai Gla**

Jai Gla

Sample output: Identical

Sol.-

```
#include <stdio.h>

int main() { char str1[100],
    str2[100]; int i, flag = 0;

    printf("Enter the first string: ");
    gets(str1);

    printf("Enter the second string: ");
    gets(str2);

    for(i = 0; str1[i] != '\0' || str2[i] != '\0'; i++) {
        if(str1[i] != str2[i]) { printf("Not
        Identical\n"); flag = 1; break;
        }
```

```
    }
    if(flag == 0) {
        printf("Identical\n");
    }

    return 0;
}
```

```
Compile Result

Enter the first string: jai
Enter the second string: jai
Identical

[Process completed - press Enter]
```

Q. 8 Write a C program to take a list of a student's names from user by asking number of students and sort them alphabetical order.

Sample Input:

Bhisham

Jayant

Abhishek

Dhruv

Sample Output:

Abhishek

Bhisham

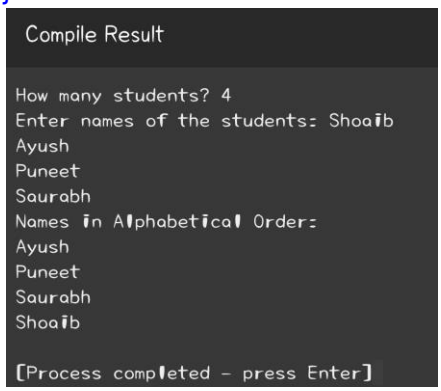
Dhruv

Jayant

Sol.-

```
#include <stdio.h>
```

```c
#include <string.h>
int main() { int i, j, n; char
    str[25][50], temp[50];

    printf("How many students? ");
    scanf("%d", &n);

    printf("Enter names of the students: ");
    for(i=0; i<n; i++) {
        scanf("%s", str[i]);
    }

    for(i=0; i<n-1; i++){
        for(j=i+1; j<n; j++){
            if(strcmp(str[i], str[j]) > 0) {
                strcpy(temp, str[i]);
                strcpy(str[i], str[j]);
                strcpy(str[j], temp);
            }
        }
    }

    printf("Names in Alphabetical Order: \n");
    for(i=0; i<n; i++) {
        printf("%s\n", str[i]);
    }

    return 0;
}
```



C- Programming Language

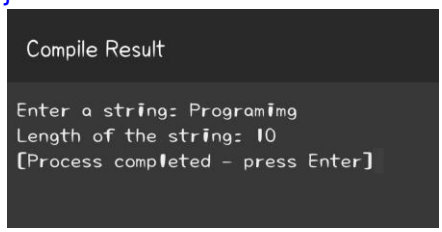
Week – 10

Programming Questions

Q. 1 Write a C program to find length of string using pointers.

Sol.

```
#include<stdio.h>

int string_length(char* ptr) {
   int length = 0;
   while(*ptr != '\0') {
      length++;
      ptr++;
   }
   return length;
}

int main() {
   char str[50];

   printf("Enter a string: "); gets(str); printf("Length of
   the string: %d", string_length(str));

   return 0;
}
```

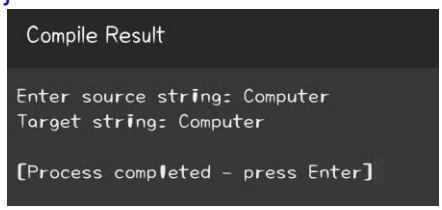


Q. 2 Write a C program to copy one string to another using pointer.

Sol.-

```
#include <stdio.h> void copy_string(char

*target, char *source) { while(*source) {

*target = *source; source++; target++;

   }
```

```
    *target = '\0';
}

int main() {
    char source[100], target[100];

    printf("Enter source string: ");

    fgets(source, sizeof(source), stdin);

    copy_string(target, source);

    printf("Target string: %s", target);

    return 0;
}
```



Q. 3 Write a C program to concatenate two strings using pointers.

Sol.

```
#include<stdio.h>

void concatenate(char* target, char* source) {
    while(*target) {
        target++;
    }

    while(*source) {
        *target = *source;
        target++;
        source++;
    }
    *target = '\0';
}

int main() {
    char source[100], target[100];

    printf("Enter first string: ");
    gets(target);
```

```
    printf("Enter second string: "); gets(source);

    concatenate(target, source); printf("String

    after concatenation: %s", target);

    return 0;
}
```

```
Compile Result

Enter first string: com
Enter second string: puter
String after concatenation: computer
[Process completed - press Enter]
```

Q. 4 Write a C program to compare two strings using pointers.

Sol.-

```
#include <stdio.h>

int compare_strings(char *str1, char *str2) {
    while(*str1 && (*str1 == *str2))
    {
        str1++;
        str2++;
    }
    return *str1 - *str2;
}

int main() {
    char str1[100], str2[100];

    printf("Enter first string: ");
    gets(str1);

    printf("Enter second string: ");

    gets(str2); int result =

    compare_strings(str1, str2); if(result

    == 0) {

        printf("Strings are equal.");
    }
    else {
```

```
        printf("Strings are not equal.");
    }

    return 0;
}
```

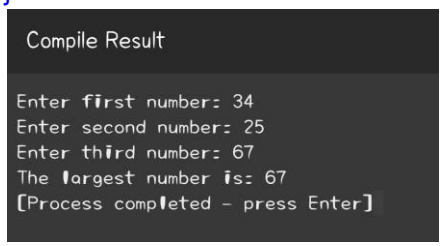
```
Compile Result

Enter first string: kite
Enter second string: kite
Strings are equal.
[Process completed - press Enter]
```

Q. 5 WAP to find largest among three numbers using pointer

Sol.

```
#include
<stdio.h>

void find_largest(int *n1, int *n2, int *n3) {
    if(*n1 > *n2) {
        if(*n1 > *n3) {
            printf("The largest number is: %d", *n1);
        } else { printf("The largest number is: %d",
            *n3);
        }
    } else { if(*n2 >
        *n3) {
            printf("The largest number is: %d", *n2);
        } else { printf("The largest number is: %d",
            *n3);
        }
    }
}

int main() {
    int n1, n2, n3;

    printf("Enter first number: ");
    scanf("%d", &n1);

    printf("Enter second number: ");
    scanf("%d", &n2);
```

```
    printf("Enter third number: ");
    scanf("%d", &n3);
    find_largest(&n1, &n2, &n3);

    return 0;
}
```

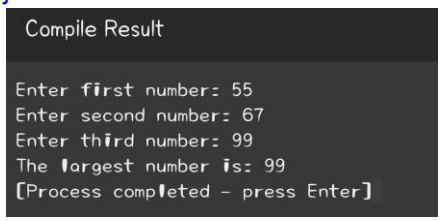


Q. 6 WAP to find largest among three numbers using pointer.

Sol.-

```
#include <stdio.h>

void find_largest(int *n1, int *n2, int *n3) {
    if(*n1 > *n2) {
        if(*n1 > *n3) {
            printf("The largest number is: %d", *n1);
        } else { printf("The largest number is: %d",
            *n3);
        }
    } else { if(*n2 >
        *n3) {
            printf("The largest number is: %d", *n2);
        } else { printf("The largest number is: %d",
            *n3);
        }
    }
}

int main() {
    int n1, n2, n3;

    printf("Enter first number: ");
    scanf("%d", &n1);
```

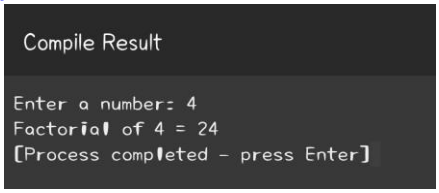
```
    printf("Enter second number: ");
    scanf("%d", &n2); printf("Enter
    third number: "); scanf("%d",
    &n3); find_largest(&n1, &n2,
    &n3);
    return 0;
}
```



Q. 7 WAP to find factorial of a number using pointer.

Sol.-

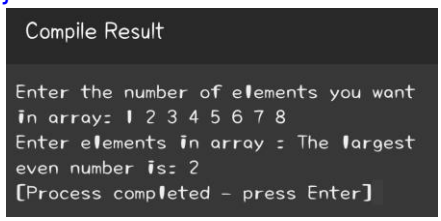
```
#include <stdio.h>

void factorial(int *num, int *fact) {
    *fact = 1; for(int i = 1; i <=
    *num; i++) { *fact *= i;
    }
}

int main() {
    int num; int
    fact = 1;

    printf("Enter a number: "); scanf("%d",
    &num); factorial(&num, &fact);
    printf("Factorial of %d = %d", num, fact);

    return 0;
}
```



Q. 8 Write a program to print largest even number present in an array using pointer to an array.

Sol.-

```
#include <stdio.h>

void largest_even(int *arr, int n) {
   int largest = -1; for(int i = 0; i < n; i++) { if
   (*(arr+i) % 2 == 0 && *(arr+i) > largest) {
   largest = *(arr+i);
      }
   }
   if (largest != -1)
      printf("The largest even number is: %d", largest);
   else
      printf("No even number found");
}

int main() { int
   arr[100], n, i;

   printf("Enter the number of elements you want in array: ");
   scanf("%d", &n);

   printf("Enter elements in array : ");
   for(i = 0; i < n; i++) { scanf("%d",
   &arr[i]);
   }

   largest_even(arr, n);

   return 0;
}
```

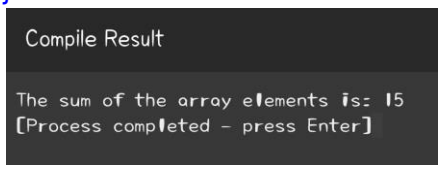


Q. 9 WAP to find sum of elements of an array using array of pointer.

Sol.-

```
#include <stdio.h>
int main() { int arr[5] = {1,
   2, 3, 4, 5}; int *ptr[5];
```

```
    int sum = 0, i;

    for(i = 0; i < 5; i++){
        ptr[i] = &arr[i]; // Assign the address of each of array element.
    }

    for(i = 0; i < 5; i++){
        sum += *ptr[i]; // Add the value at address stored in pointer.
    }

    printf("The sum of the array elements is: %d", sum);

    return 0;
}
```



Q. 10 WAP to compute simple interest using pointers.

Sol.-

```
#include <stdio.h>

void calculate_simple_interest(float *p, float *r, float *t, float *si) {
    *si = (*p * *r * *t) / 100;
}

int main() {
    float p, r, t, si;

    printf("Enter principal amount: ");
    scanf("%f", &p); printf("Enter rate of
    interest: "); scanf("%f", &r); printf("Enter
    time in years: "); scanf("%f", &t);
    calculate_simple_interest(&p, &r, &t, &si);
    printf("The Simple Interest is: %.2f", si);
    return 0;
}
```

```
Compile Result

Enter principal amount: 1000
Enter rate of interest: 5
Enter time in years: 2
The Simple Interest is: 100.00
[Process completed - press Enter]
```

Q. 11 Write a program to print largest even number present in an array using pointer to an array.

Sol.-

```
#include <stdio.h>

int find_largest_even(int *arr, int n) {
   int max_even = -1; for(int i = 0; i < n; i++) {
   if(arr[i] % 2 == 0 && arr[i] > max_even) {
         max_even = arr[i];
      }
   }
   return max_even;
}

int main() { int arr[5] = {2, 4, 1, 3, 5}; int
   max_even = find_largest_even(arr, 5);
   if(max_even != -1) {
      printf("The largest even number is: %d", max_even);
   } else { printf("No even number found in the
      array.");
   }
   return 0;
}
```

```
Compile Result

The largest even number is: 4
[Process completed - press Enter]
```

C- Programming Language

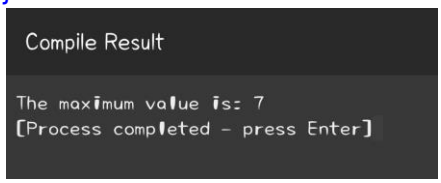
Week – 11

Programming Questions

Q. 1 Write a C function to return the maximum of three integers.

Sol.-

```
#include <stdio.h>

int max_of_three(int a, int b, int c) {
    int max = a;
    if (b > max) {
        max = b;
    }
    if (c > max) {
        max = c;
    }
    return max;
}

int main() {
    int a = 3, b = 5, c = 7; int max =
    max_of_three(a, b, c); printf("The
    maximum value is: %d", max); return 0;
}
```



Q. 2 Write a C function to check if a given number is prime or not.

Sol.-

```
#include <stdio.h>

int is_prime(int num) {
    if(num <= 1)
        return 0;
    if(num <= 3)
        return 1; if(num
        % 2 == 0 ||
        num % 3 == 0)
        return 0;
    for(int i = 5; i * i <= num; i = i + 6)
        if(num % i == 0 || num % (i + 2) == 0)
            return 0;
    return 1;
}
```

```
int main() {
   int num = 17;
   if(is_prime(num))
      printf("%d is a prime number.", num);
   else
      printf("%d is not a prime number.", num);
   return 0;
}
```

```
Compile Result

17 is a prime number.
[Process completed - press Enter]
```

Q. 3 Write a C function to compute the factorial of a non-negative integer.

Sol.-

```
#include <stdio.h>

int factorial(int n) {
   if(n == 0)
      return 1;
   else
      return n * factorial(n-1);
}

int main() {
   int num = 5;
   printf("The factorial of %d is: %d", num, factorial(num));
   return 0;
}
```

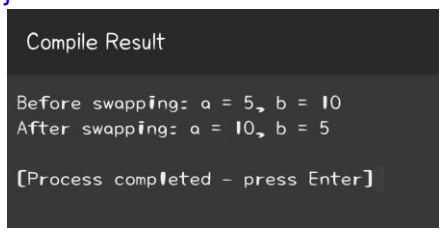
```
Compile Result

The factorial of 5 is: 120
[Process completed - press Enter]
```

Q. 4 Write a C function to swap the values of two integers in actual arguments.

Sol.-

```
#include <stdio.h>

void swap(int* a, int* b) {
   int temp = *a;
   *a = *b;
```

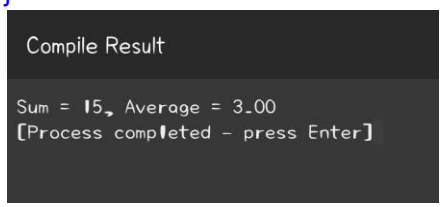
```
    *b = temp;
}

int main() {
    int a = 5, b = 10; printf("Before swapping: a =
    %d, b = %d\n", a, b); swap(&a, &b);
    printf("After swapping: a = %d, b = %d\n", a, b);
    return 0;
}
```



Q. 5 Write a C function to compute the sum and average of an array of integers.

Sol.-

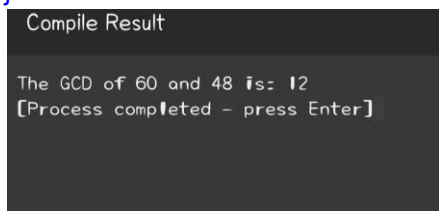
```
#include <stdio.h>

void sum_and_average(int arr[], int n, int* sum, float* avg) {
    *sum = 0; for(int i = 0; i
    < n; i++) { *sum +=
    arr[i];
    }
    *avg = (float)(*sum) / n;
}

int main() {
    int arr[] = {1, 2, 3, 4, 5}; int n = sizeof(arr) /
    sizeof(arr[0]); int sum = 0; float avg = 0.0f;
    sum_and_average(arr, n, &sum, &avg);
    printf("Sum = %d, Average = %.2f", sum, avg);
    return 0;
}
```



Q. 6 Write a C function to find the GCD (Greatest Common Divisor) of two nonnegative integers using Euclid's algorithm.

Sol.-

```
#include <stdio.h>

int gcd(int a, int b) {
   if(b == 0)
      return a;
   else
      return gcd(b, a % b);
}

int main() {
   int num1 = 60, num2 = 48; printf("The GCD of %d and %d is: %d",
   num1, num2, gcd(num1, num2)); return 0;
}
```

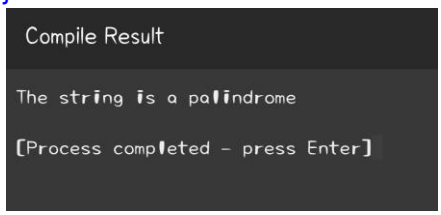


Q. 7 Write a C function to check if a given string is a valid palindrome, considering only alphanumeric characters and ignoring cases.

Sol.-

```
#include <stdio.h>
#include <string.h>
#include <ctype.h>

int isPalindrome(char* str) {
   int start = 0, end = strlen(str) - 1;

   while (start < end) {
      if (!isalnum(str[start])) {
         start++;
      } else if (!isalnum(str[end])) { end-
         -;
      } else if (tolower(str[start]) != tolower(str[end])) {
         return 0;
      } else {
         start++;
         end--;
```

```
        }
    }
    return 1;
}

int main() {
    char str[] = "A man, a plan, a canal: Panama";

    if(isPalindrome(str)) {
        printf("The string is a palindrome\n");
    } else { printf("The string is not a
        palindrome\n");
    }
    return 0;
}
```

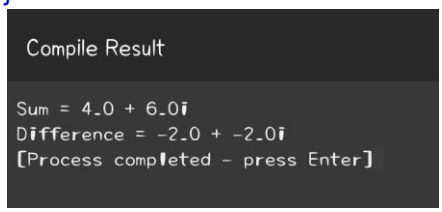


Q. 8 Write a C function to calculate the sum and difference of two complex numbers.

Sol.-

```
#include <stdio.h>

typedef struct complex
{ float real; float imag; }
complex;

complex addComplex(complex n1, complex n2) {
    complex temp; temp.real =
    n1.real + n2.real; temp.imag =
    n1.imag + n2.imag; return temp;
}
complex subtractComplex(complex n1, complex n2) {
    complex temp; temp.real =
    n1.real - n2.real; temp.imag =
    n1.imag - n2.imag; return temp;
}

int main() {
    complex n1 = {1.0, 2.0}, n2 = {3.0, 4.0}, result;
```

```
    result = addComplex(n1, n2); printf("Sum = %.1f +
    %.1fi\n", result.real, result.imag);

    result = subtractComplex(n1, n2); printf("Difference =
    %.1f + %.1fi", result.real, result.imag);

    return 0;
}
```



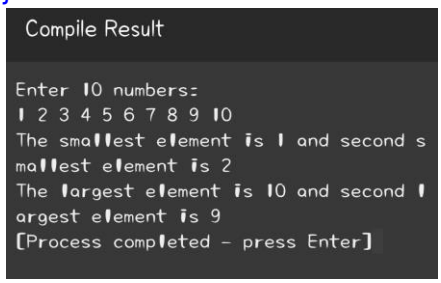
H.O.T.S Questions

Q. 9 Write a C function to find the second largest and second smallest elements in an array of integers.

Sol.-

```
#include <stdio.h>
#define SIZE 10
#define MAX 10000

void findSecondLargestSmallest(int arr[], int arrSize) {
    int i, first, second;

    if (arrSize < 2) { printf("
        Invalid Input "); return;
    }

    first = second = MAX;
    for (i = 0; i < arrSize; i++) {
        if (arr[i] < first) { second
        = first; first = arr[i];
        }
        else if (arr[i] < second && arr[i] != first)
            second = arr[i];
    }

    printf("The smallest element is %d and second smallest element is %d\n", first, second);
```

```
    first = second = -MAX; for
    (i = 0; i < arrSize; i++) { if
    (arr[i] > first) { second =
    first; first = arr[i];
        }
        else if (arr[i] > second && arr[i] != first)
            second = arr[i];
    }

    printf("The largest element is %d and second largest element is %d", first, second);
}

int main() {
    int numbers[SIZE], i;

    printf("Enter 10 numbers:\n");
    for(i = 0; i < SIZE; i++) {
        scanf("%d", &numbers[i]);
    }

    findSecondLargestSmallest(numbers, SIZE);

    return 0;
}
```

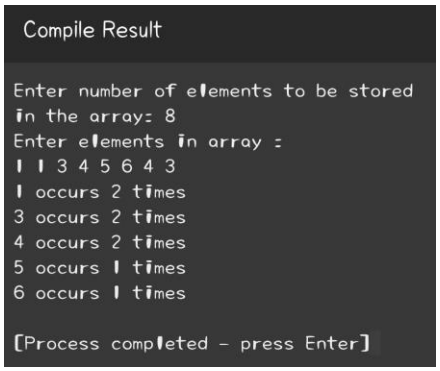


Q. 10 Write a C function to find the number of occurrences of each unique element in an array.

Sol.-

```
#include <stdio.h>
#define MAX_SIZE 100

void findElementCount(int arr[], int len) {
    int count[MAX_SIZE] = {0};

    for(int i = 0; i < len; i++) {
        count[arr[i]]++;
    }
```

```
    for(int i = 0; i < len; i++) { if(count[arr[i]] != 0) {
        printf("%d occurs %d times\n", arr[i], count[arr[i]]);
        count[arr[i]] = 0;
        }
    }
}

int main() {
    int numbers[MAX_SIZE], num, i;

    printf("Enter number of elements to be stored in the array: ");
    scanf("%d", &num);

    printf("Enter elements in array : \n");
    for(i = 0; i < num; i++) { scanf("%d",
    &numbers[i]);
    }

    findElementCount(numbers, num);

    return 0;
}
```



Voting System

```
#include<stdio.h>

int main()
{
int
current_year,yob,a
ge;

char a,b;
printf("Your
Name:-");

scanf("%s
%s",&a,&b);

printf("Your year
Of Birth:-");

scanf("%d",&yob);

printf("Enter
current year:-  ");
scanf("%d",&curre
nt_year);
```

```
age=current_year-
yob;

printf("\nYour age
is:%d",age);

if(age>=18){


          printf("\nYo
u are eligible for
voting");

 int num,n;

 printf("\nHere are
the list of the
political parties
with voting no.");

printf("\n1.BJP,
press 1 for
voting");

printf("\n2.BSP,
press 2 for
voting");

printf("\n3.AAP,
press 3 for
voting");

printf("\n4.SP,
press 4 for
voting");

printf("\n5.CONGR
ESS, press 5 for
voting");
```

```
            break;

            case 3:

            printf("\nTh
ank you voting
AAP");

            printf("\n
Your record has
been recorded");

            break;

            case 4:

            printf("\nTh
ank you voting
SP");

            printf("\n
Your record has
been recorded");

            break;
```

```
            case 5:



            printf("\nTh
ank you voting
CONGRESS");



            printf("\n
Your record has
been recorded");



            break;

                        }



}
else{


            printf("\nWr
ong no. entered");


            printf("\nPl
ease enter
between 1 to 5");


            printf("\nTh
ank you");
}

}
```

```
else
{
printf("\nYou are
not eligible for
voting");

}
}
```

Quiz

```
#include <stdio.h>
#include
<string.h>
#include <time.h>
#include
<unistd.h>

void
displayResult(int
score);

int main() {
    char name[50];
    char
studentClass[20];
    int rollNumber;

    char
questions[10][200]
= {
        "What is
2+2?\nA) 3\nB)
4\nC) 5\nD) 6",
        "Multiply
7*8?\nA) 56\nB)
64\nC) 72\nD) 80",
```

```
        // ... (other
questions)
    };

    char
answers[10][2] = {
        "B", "A", "B",
"B", "A", "C", "A",
"B", "B", "A"
    };

    int totalTimer =
10 * 60;
    int score = 0;

    printf("Enter
your name: ");
    fgets(name,
sizeof(name),
stdin);

    printf("Enter
your class: ");

fgets(studentClass
,
sizeof(studentClas
s), stdin);

    printf("Enter
your roll number:
");
    scanf("%d",
&rollNumber);
    while (getchar()
!= '\n'); // Clear
input buffer

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

printf("\nQuestion
```

```
%d: %s\n", i + 1,
questions[i]);
        printf("You
have 1 minute to
answer.\n");

        time_t start,
end;
        time(&start);
        int
elapsed_time = 0;
        int
remaining_time =
60;

        char
userAnswer[3]; //
Increased size to
accommodate \n
and \0

        printf("Your
answer (Enter the
option letter): ");

fgets(userAnswer,
sizeof(userAnswer
), stdin);

        if
(strlen(userAnswe
r) > 2 ||
userAnswer[1] !=
'\n') {

printf("Invalid
input. Please enter
a single option
letter.\n");
            i--; //
Repeat the same
question
            continue;
```

```
        }


userAnswer[1] =
'\0'; // Null-
terminate the
string

        time(&end);
        elapsed_time
= difftime(end,
start);
        totalTimer -=
elapsed_time;

        if
(strcasecmp(user
Answer,
answers[i]) == 0) {

printf("Correct!\n");
            score++;
        } else {

printf("Incorrect.
The correct
answer is: %s\n",
answers[i]);
        }

        if (totalTimer
<= 0) {
            printf("Quiz
time exhausted!
The quiz will
end.\n");
            break;
        }
    }


displayResult(scor
e);
```

```
    return 0;
}

void
displayResult(int
score) {

printf("\n**********
* Result
**********\n");
    printf("Total
Score: %d out of
10\n", score);
    if (score == 10)
{

printf("Congratulati
ons! Perfect
score.\n");
    } else {
        printf("Keep
practicing for
better results.\n");
    }
}
```