Week-0
ARRAYS AND FUNCTIONS
Section1: coding

1)

```
#include<stdio.h>
//you are using Gcc
void setzeros(int arr[10][10], int n) {
   //Type your code here
   for(int i=1;i<n;i++){
      for(int j=0;j<i;j++){
         arr[i][j]=0;
   } }
    for(int i=0;i<n;i++){
        for(int j=0;j<n;j++){
           if(i==j)
              arr[i][j]=0;
       }
    }
}
int main(){
    int arr1[10][10];
    int n;
    scanf("%d",&n);
    for(int i=0;i<n;i++){
        for(int j=0;j<n;j++){
            scanf("%d",&arr1[i][j]);
    }
}
```

```
    SetZeros(arr1,n);
    for(int i=0; i<n; i++){
        for(int j=0; j<n; j++){
            printf("%d", arr1[i][j]);
        }
        printf("\n");
    }
    return 0;
}
```

2)

```
#include<stdio.h>
// You are using Gcc
void calculateRowSum(int matrix[20][20], int rows, int cols){
{
    //Type Your code here
    for(int i=0; i<rows; i++){
        int sum=0;
        for(int j=0; j<cols; j++){
            sum+=matrix[i][j];
        }
        printf("%d", sum);
    }
}
int main() {
    int matrix[20][20];
    int r, c;
    scanf("%d", &r);
    scanf("%d", &c);
```

```
for (int i=0; i<r; i++){
    for (int j=0; j<c; j++){
        scanf("%d", &matrix[i][j]);
    }
}
calculateRowSum(matrix, r, c);
return 0;
}
```

3)

```
// You are using Gcc
#include<stdio.h>
int main() {
    int x;
    scanf("%d", &x);
    int arr[x];
    for(int i=0; i<x; i++) {
        scanf("%d", &arr[i]);
    }
    int max=arr[0];
    for(int i=1; i<x; i++){
        if (arr[i]>max)
            max=arr[i];
    }
    int min=arr[0];
    for (int i=1; i<x; i++) {
        if(arr[i]<min)
            min=arr[i];
    }
```

```
float avg=0;
for(int i=0; i<x; i++){
    avg+=arr[i];
}
for(int i=0; i<x; i++){
    Printf("Employee %d : %d\n", i+1, arr[i]);
}
Printf("\n Average Salary: %.2f\nHighest Salary : %d\n Lowest Salary:
%d", avg/x, max, min);
}
```

~~%d", avg/x, max, min);~~

4)

```
// You are using Gcc
# include<stdio.h>
int findsmall(int arr[], int x) {
    int min = arr[0];
    for(int i=0; i<x; i++){
        if (arr[i]<min)
            min= arr[i];
    }
    return min;
}
int findMax(int arr[], int x) {
    int max=arr[0];
    for(int i=0; i<x; i++){
        if (arr[i]> max)
            max = arr[i];
    }
    return max;
}
```

```
int findSum(int arr[], int x){
    int sum=0;
    for(int i=0; i<x; i++){
        sum+=arr[i];
    }
    return sum;
}
float findAvg(int arr[], int x){
    float avg=0;
    for(int i=0; i<x; i++){
        avg+=arr[i];
    }
    return avg;
}
int main(){
    int x, choice;
    Scanf("%d", &x);
    int arr[x];
    for(int i=0; i<x; i++){
        Scanf("%d", &arr[i]);
    }
    do{
        scanf("%d", &choice);
        Switch(choice){
        case 1:
        Printf("The Smallest number is: %d\n", findSmall(arr, x));
        break;
        case 2:
        Printf("The largest number is: %d\n", findMax(arr, x));
        break;
        case 3:
        Printf("The sum of the numbers is: %d\n", findSum(arr, x));
```

```
            break;
            case 4:
            printf("The average of the numbers is: %.2f\n", findAvg(arr,x)
            /x);
            break;
            case 5:
            Printf(" Existing the program\n");
            return 0;
            break;
            default;
            Printf("Invalid choice! please enter a valid
            option (1-5).\n");
        }
    } while(choice!=5);
}
```

5)

```
// You are using Gcc
#include<stdio.h>
int main(){
    int n,m;
    scanf("%d" %d", &n,&m);
    int matrix[n][m];
    for(int i=0; i<n; i++){
        for(int j=0; j<m; j++){
            scanf("%d", &matrix[i][j]);
        }
    }
    int lastses = matrix[n-1][m-1];
    if(lastses % 2==0)
        Printf("%d is even", lastses);
    else
        Printf("%d is odd", lastses);
}
```

Week-0

POINTERS

1) Section1: coding

```
//You are using Gcc
#include<stdio.h>
#include<string.h>
Struct Employee{
    char name[100];
    double currentSalary;
    int hoursWorked;
};
int main(){
    Struct Employee emp;
    double increment=0.0, finalSalary, totalSalary;
// input
fgets(emp.name, sizeof(emp.name), stdin); //Read employee name
scanf("%lf", &emp.currentSalary); //Read current Salary
scanf("%d", &emp.hoursWorked); //Read hours worked.
//Remove trailing newline from name if present
size_t len=strlen(emp.name);
if (len>0 && emp.name[len-1]=='\n'){
    emp.name[len-1]='\0';
}
//Salary increment logic
if (emp.hoursWorked >=12) {
  increment = 150.00;
} else if (emp.hoursWorked >=10) {
  increment =100.00;
} else if (emp.hoursWorked >=8){
  increment = 50.00;
}
```

```
    final salary = emp.current salary + increment;
    total salary = final salary * 30;
    // output
    Printf("Final Salary: Rs. %.2f\n", final salary);
    Printf ("Total Salary: Rs. %.2f\n", total salary);
    Return 0;
}
```

2)

```
// you are using Gcc
#include<stdio.h>
#include<math.h>
int main()
{
 int n;
 Scanf("%d", &n);
 float *temp = (float*) malloc(n*sizeof(float));
 for(int i=0; i<n; i++)
 Scanf("%f", &temp[i]);
 Printf("%.2f", temp[0]);
 for(int i=1; i<n; i++)
 Printf("%.2f", fabs(temp[i] - temp[i-1]));
 Printf("\n");
 Printf("%.2f", temp[0]);
 for(int i=1; i<n-1; i++)
 {
 Printf("%.2f", (temp[i-1] + temp[i+1])/2.0);
 temp[i] = (tem[i-1] + temp[i+1])/2.0;
 }
```

```
    printf("%.2f", temp[n-1]);
    free(temp);
    return 0;
}
```

3)

```
// you are using Gcc
#include<stdio.h>
#include<stdlib.h>
int main() {
  int N;
  scanf("%d", &N);
  float *arr = (float*) malloc(N*sizeof(float));
  int allpositive = 1;
  int anypositive=0;
  for(int i=0; i<N; i++){
     scanf("%f", &arr[i]);
     if (arr[i]>0)
        any positive = 1;
     else
        all positive = 0;
   }
   if(all positive)
     printf("All elements are positive.\n");
   else if (any positive)
     printf("At least one element is positive.\n");
   else
     printf("No positive elements in the array.\n");
   free(arr);
   return 0;
}
```

4)

```
// You are using Gcc
#include <stdio.h>
long long fact(int n, int r)
{
  long long f=1;
  for(int i=0; i<r; i++){
     f*=(n-i);
  }
  return f;
}
int main(){
    int n,r;
    long long x;
    scanf("%d %d",&n,&r);
    x=fact(n,r);
    printf("%lld\n",x);
    return 0
  }
```

5)

```
// You are using Gcc
#include<stdio.h>
#include<stdlib.h>
#define CURRENT_YEAR 2023
#define RETIREMENT_AGE 65
#define DAYS_IN_YEAR 365
struct Person{
    int age;
};
```

```
int main() {
Struct Person *p = (struct Person*) malloc(sizeof(struct Person));
Scanf("%d", &p->age);
if (p->age < 18) {
   Printf("Invalid\n");
} else if (p->age >= RETIREMENT_AGE) {
   Printf("Already Retired!\n");
} else {
   int remaining-years = RETIREMENT_AGE - p->age;
   int retirement-year = CURRENT_YEAR + remaining-years;
   int remaining-days = remaining-years * DAYS_IN_YEAR;
   Printf("Retirement Year: %d\n", retirement-year);
   Printf("Remaining Years: %d\n", remaining_Years);
   Printf("Remaining Days: %d\n", remaining_days);
}
free(p);
return 0;
}
```