Aim: To excute code of Crime statiscis Analyzer in C programing

Program:

```c
 #include <stdio.h>
#include <string.h>
#include <stdlib.h>
#define MAX_CRIMES 100
#define MAX_NAME 50
// Structure to store crime data
typedef struct {
    char type[MAX_NAME];
    char city[MAX_NAME];
    int year;
    int cases;
} Crime;
// Function prototypes
void inputCrimes(Crime crimes[], int *count);
void displayCrimes(Crime crimes[], int count);
void analyzeByType(Crime crimes[], int count);
void analyzeByCity(Crime crimes[], int count);
void analyzeByYear(Crime crimes[], int count);
void findHighestCrime(Crime crimes[], int count);
void calculateTotalCases(Crime crimes[], int count);
void sortByCases(Crime crimes[], int count);
```

```c
int main() {
    Crime crimes[MAX_CRIMES];
    int count = 0;
    int choice;
    printf("=====================================\n");
    printf("   CRIME STATISTICS ANALYZER SYSTEM\n");
    printf("=====================================\n\n");
    // Sample data for demonstration
    strcpy(crimes[0].type, "Theft");
    strcpy(crimes[0].city, "New York");
    crimes[0].year = 2023;
    crimes[0].cases = 1250;
    strcpy(crimes[1].type, "Robbery");
    strcpy(crimes[1].city, "Los Angeles");
    crimes[1].year = 2023;
    crimes[1].cases = 890;
    strcpy(crimes[2].type, "Theft");
    strcpy(crimes[2].city, "Chicago");
    crimes[2].year = 2023;
    crimes[2].cases = 1100;
    strcpy(crimes[3].type, "Assault");
    strcpy(crimes[3].city, "New York");
    crimes[3].year = 2023;
    crimes[3].cases = 760  strcpy(crimes[4].type, "Burglary");
```

```c
strcpy(crimes[4].city, "Houston");

crimes[4].year = 2023;

crimes[4].cases = 540;

strcpy(crimes[5].type, "Theft");

strcpy(crimes[5].city, "Los Angeles");

crimes[5].year = 2022;

crimes[5].cases = 1320;

strcpy(crimes[6].type, "Assault");

strcpy(crimes[6].city, "Chicago");

crimes[6].year = 2022;

crimes[6].cases = 680;

count = 7;

do {

printf("\n====================================\n");

  printf("          MAIN MENU\n");

  printf("====================================\n");

  printf("1. Display All Crime Records\n");

  printf("2. Add New Crime Record\n");

  printf("3. Analyze by Crime Type\n");

  printf("4. Analyze by City\n");

  printf("5. Analyze by Year\n");

  printf("6. Find Highest Crime Rate\n");

  printf("7. Calculate Total Cases\n");

  printf("8. Sort by Cases (Descending)\n");
```

```c
printf("9. Exit\n");
printf("======================================\n");
printf("Enter your choice: ");
scanf("%d", &choice);
switch(choice) {
    case 1:
        displayCrimes(crimes, count);
        break;
    case 2:
        inputCrimes(crimes, &count);
        break;
    case 3:
        analyzeByType(crimes, count);
        break;
    case 4:
        analyzeByCity(crimes, count);
        break;
    case 5:
        analyzeByYear(crimes, count);
        break;
    case 6:
        findHighestCrime(crimes, count);
        break;
    case 7:
```

```c
                calculateTotalCases(crimes, count);

                break;

            case 8:

                sortByCases(crimes, count);

                printf("\nRecords sorted successfully!\n");

                displayCrimes(crimes, count);

                break;

            case 9:

                printf("\nThank you for using Crime Statistics
Analyzer!\n");

                break;

            default:

                printf("\nInvalid choice! Please try again.\n");

        }

    } while(choice != 9);

    return 0;

}

void inputCrimes(Crime crimes[], int *count) {

    if(*count >= MAX_CRIMES) {

        printf("\nDatabase is full!\n");

        return;

    }

    printf("\n--- Add New Crime Record ---\n");

    printf("Enter Crime Type: ");
```

```c
    scanf(" %[^\n]", crimes[*count].type);

    printf("Enter City: ");

    scanf(" %[^\n]", crimes[*count].city);

    printf("Enter Year: ");

    scanf("%d", &crimes[*count].year);

    printf("Enter Number of Cases: ");

    scanf("%d", &crimes[*count].cases);

    (*count)++;

    printf("\nRecord added successfully!\n");

}

void displayCrimes(Crime crimes[], int count) {

    printf("\n====================================\n");

    printf("      ALL CRIME RECORDS\n");

    printf("====================================\n");

    printf("%-15s %-15s %-8s %-8s\n", "Crime Type", "City", "Year",
"Cases");

    printf("-------------------------------------\n");

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

        printf("%-15s %-15s %-8d %-8d\n",

            crimes[i].type,

            crimes[i].city,

            crimes[i].year,

            crimes[i].cases);

    }
```

```c
        printf("---------------------------------------\n");
        printf("Total Records: %d\n", count);
    }
    void analyzeByType(Crime crimes[], int count) {
        char searchType[MAX_NAME];
        int total = 0, found = 0;
        printf("\nEnter Crime Type to analyze: ");
        scanf(" %[^\n]", searchType);
        printf("\n--- Analysis for Crime Type: %s ---\n", searchType);
        printf("%-15s %-8s %-8s\n", "City", "Year", "Cases");
        printf("---------------------------------------\n");
        for(int i = 0; i < count; i++) {
            if(strcasecmp(crimes[i].type, searchType) == 0) {
                printf("%-15s %-8d %-8d\n",
                    crimes[i].city,
                    crimes[i].year,
                    crimes[i].cases);
                total += crimes[i].cases;
                found++;
            }
        }
        if(found > 0) {
            printf("---------------------------------------\n");
            printf("Total Cases: %d\n", total);
```

```c
        printf("Average Cases: %.2f\n", (float)total/found);
    } else {
        printf("No records found for this crime type.\n");
    }
}
void analyzeByCity(Crime crimes[], int count) {
    char searchCity[MAX_NAME];
    int total = 0, found = 0;
    printf("\nEnter City to analyze: ");
    scanf(" %[^\n]", searchCity);
    printf("\n--- Analysis for City: %s ---\n", searchCity);
    printf("%-15s %-8s %-8s\n", "Crime Type", "Year", "Cases");
    printf("--------------------------------------\n");
    for(int i = 0; i < count; i++) {
        if(strcasecmp(crimes[i].city, searchCity) == 0) {
            printf("%-15s %-8d %-8d\n",
                crimes[i].type,
                crimes[i].year,
                crimes[i].cases);
            total += crimes[i].cases;
            found++;
        }
    }
```

```c
        if(found > 0) {
            printf("-------------------------------------\n");
            printf("Total Cases: %d\n", total);
            printf("Average Cases: %.2f\n", (float)total/found);
        } else {
            printf("No records found for this city.\n");
        }
    }
    void analyzeByYear(Crime crimes[], int count) {
        int searchYear;
        int total = 0, found = 0;
        printf("\nEnter Year to analyze: ");
        scanf("%d", &searchYear);
        printf("\n--- Analysis for Year: %d ---\n", searchYear);
        printf("%-15s %-15s %-8s\n", "Crime Type", "City", "Cases");
        printf("-------------------------------------\n");
        for(int i = 0; i < count; i++) {
            if(crimes[i].year == searchYear) {
                printf("%-15s %-15s %-8d\n",
                    crimes[i].type,
                    crimes[i].city,
                    crimes[i].cases);
                total += crimes[i].cases;
                found++;
```

```c
        }
    }
    if(found > 0) {
        printf("----------------------------------------\n");
        printf("Total Cases: %d\n", total);
        printf("Average Cases: %.2f\n", (float)total/found);
    } else {
        printf("No records found for this year.\n");
    }
}
void findHighestCrime(Crime crimes[], int count) {
    if(count == 0) {
        printf("\nNo records available!\n");
        return;
    }
    int maxIndex = 0;
    for(int i = 1; i < count; i++) {
        if(crimes[i].cases > crimes[maxIndex].cases) {
            maxIndex = i;
        }
    }
    printf("\n========================================\n");
    printf("     HIGHEST CRIME RATE RECORD\n");
    printf("========================================\n");
```

```c
        printf("Crime Type: %s\n", crimes[maxIndex].type);

        printf("City: %s\n", crimes[maxIndex].city);

        printf("Year: %d\n", crimes[maxIndex].year);

        printf("Cases: %d\n", crimes[maxIndex].cases);

        printf("=====================================\n");

}
void calculateTotalCases(Crime crimes[], int count) {

    int total = 0;

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

        total += crimes[i].cases;

    }

    printf("\n=====================================\n");

    printf("      TOTAL STATISTICS\n");

    printf("=====================================\n");

    printf("Total Records: %d\n", count);

    printf("Total Cases: %d\n", total);

    printf("Average Cases per Record: %.2f\n", (float)total/count);

    printf("=====================================\n");

}
void sortByCases(Crime crimes[], int count) {

    Crime temp;

    for(int i = 0; i < count - 1; i++) {

        for(int j = 0; j < count - i - 1; j++) {

            if(crimes[j].cases < crimes[j+1].cases) {
```
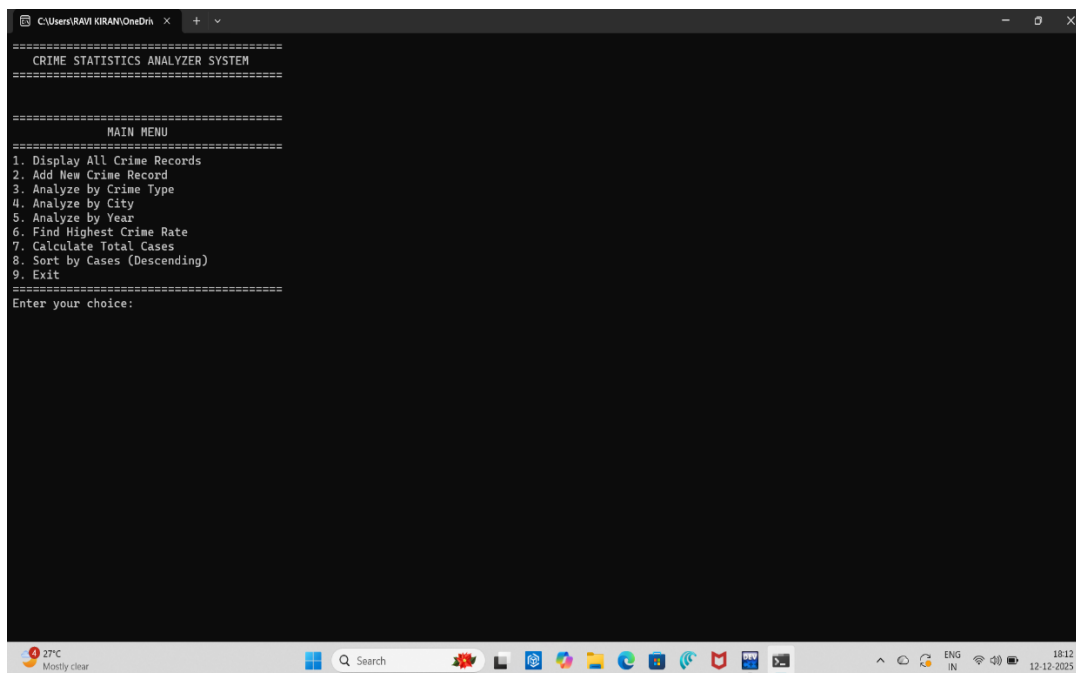
```
            temp = crimes[j];

            crimes[j] = crimes[j+1];

            crimes[j+1] = temp;

        }

    }

  }

}
```

Output:

Step:1

Step 2:


```
1. Display All Crime Records
2. Add New Crime Record
3. Analyze by Crime Type
4. Analyze by City
5. Analyze by Year
6. Find Highest Crime Rate
7. Calculate Total Cases
8. Sort by Cases (Descending)
9. Exit
=====================================
Enter your choice: 1

=====================================
        ALL CRIME RECORDS
=====================================
Crime Type     City        Year     Cases
-----------------------------------------
Theft          New York    2023     1250
Robbery        Los Angeles 2023     890
Theft          Chicago     2023     1100
Assault        New York    2023     760
Burglary       Houston     2023     540
Theft          Los Angeles 2022     1320
Assault        Chicago     2022     680
-----------------------------------------
Total Records: 7

=====================================
            MAIN MENU
=====================================
1. Display All Crime Records
2. Add New Crime Record
3. Analyze by Crime Type
4. Analyze by City
5. Analyze by Year
6. Find Highest Crime Rate
7. Calculate Total Cases
8. Sort by Cases (Descending)
9. Exit
=====================================
Enter your choice:
```

Step 3:


```
=====================================
1. Display All Crime Records
2. Add New Crime Record
3. Analyze by Crime Type
4. Analyze by City
5. Analyze by Year
6. Find Highest Crime Rate
7. Calculate Total Cases
8. Sort by Cases (Descending)
9. Exit
=====================================
Enter your choice: 3

Enter Crime Type to analyze: theft

--- Analysis for Crime Type: theft ---
City           Year    Cases
-----------------------------------------
New York       2023    1250
Chicago        2023    1100
Los Angeles    2022    1320
-----------------------------------------
Total Cases: 3670
Average Cases: 1223.33

=====================================
            MAIN MENU
=====================================
1. Display All Crime Records
2. Add New Crime Record
3. Analyze by Crime Type
4. Analyze by City
5. Analyze by Year
6. Find Highest Crime Rate
7. Calculate Total Cases
8. Sort by Cases (Descending)
9. Exit
=====================================
```

Step 4:

```
4. Analyze by City
5. Analyze by Year
6. Find Highest Crime Rate
7. Calculate Total Cases
8. Sort by Cases (Descending)
9. Exit
===================================
Enter your choice: 5

Enter Year to analyze: 2023

--- Analysis for Year: 2023 ---
Crime Type      City            Cases
-----------------------------------------
Theft           New York        1250
Robbery         Los Angeles     890
Theft           Chicago         1100
Assault         New York        760
Burglary        Houston         540
vandalism       Miami           420
-----------------------------------------
Total Cases: 4960
Average Cases: 826.67

===================================
            MAIN MENU
===================================
1. Display All Crime Records
2. Add New Crime Record
3. Analyze by Crime Type
4. Analyze by City
5. Analyze by Year
6. Find Highest Crime Rate
7. Calculate Total Cases
8. Sort by Cases (Descending)
9. Exit
===================================
Enter your choice: 6
```

Step 5:

```
Records sorted successfully!

===================================
        ALL CRIME RECORDS
===================================
Crime Type      City            Year    Cases
-----------------------------------------------
Theft           Los Angeles     2022    1320
Theft           New York        2023    1250
Theft           Chicago         2023    1100
Robbery         Los Angeles     2023    890
Assault         New York        2023    760
Assault         Chicago         2022    680
Burglary        Houston         2023    540
vandalism       Miami           2023    420
-----------------------------------------------
Total Records: 8

===================================
            MAIN MENU
===================================
1. Display All Crime Records
2. Add New Crime Record
3. Analyze by Crime Type
4. Analyze by City
5. Analyze by Year
6. Find Highest Crime Rate
7. Calculate Total Cases
8. Sort by Cases (Descending)
9. Exit
===================================
Enter your choice: 9

Thank you for using Crime Statistics Analyzer!

--------------------------------
Process exited after 688.2 seconds with return value 0
Press any key to continue . . .
```

Result: The above program is executed successfully.