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Roll No: 20BCS042

Branch: Computer Engineering

Subject: C-programming Lab

Subject code: CEN 392

Subject Teachers:

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INDEX

```
#include <stdio.h>
#include <stdlib.h>
void add(int r1, int c1, int r2, int c2, int matrix1[r1][c1], int matrix2[r2][c2])
{
    if (r1 != r2 || c1 != c2)
    {
        printf("Addition not possible");
    }
    //adding
    int c[r1][c1];
    for (int i = 0; i < r1; i++)
    {
        for (int j = 0; j < c1; j++)
        {
            c[i][j] = matrix1[i][j] + matrix2[i][j];
        }
    }
    // printing sum matrix
    for (int i = 0; i < r1; i++)
    {
        for (int j = 0; j < c1; j++)
        {
            printf("%d ", c[i][j]);
        }
        printf("\n");
    }
}
void sub(int r1, int c1, int r2, int c2, int matrix1[r1][c1], int matrix2[r2][c2])
```

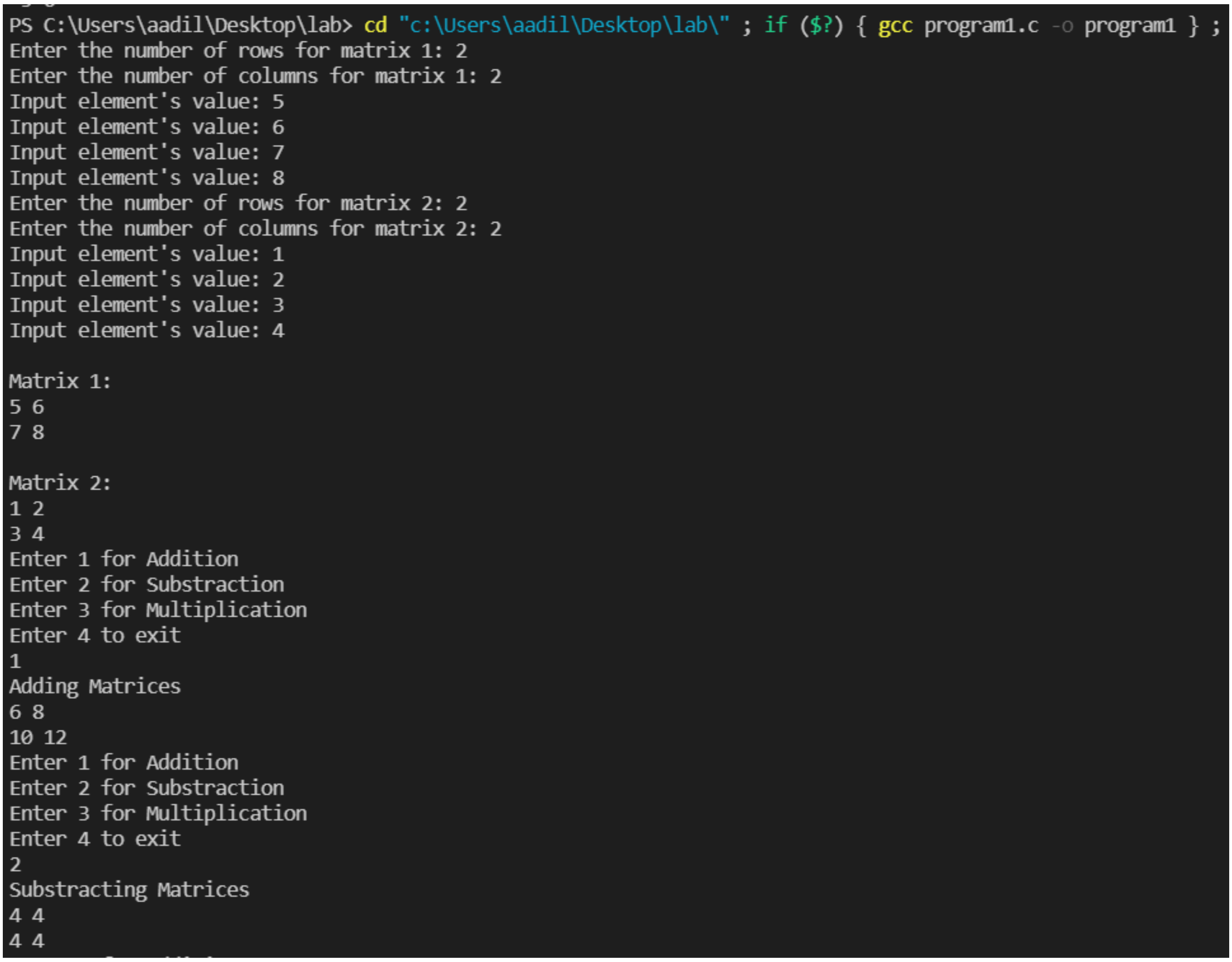
```
{
    if (r1 != r2 || c1 != c2)
    {
        printf("Addition not possible");
    }
    //adding
    int c[r1][c1];
    for (int i = 0; i < r1; i++)
    {
        for (int j = 0; j < c1; j++)
        {
            c[i][j] = matrix1[i][j] - matrix2[i][j];
        }
    }
    // printing sub matrix
    for (int i = 0; i < r1; i++)
    {
        for (int j = 0; j < c1; j++)
        {
            printf("%d ", c[i][j]);
        }
        printf("\n");
    }
}
void mult(int r1, int c1, int r2, int c2, int matrix1[r1][c1], int matrix2[r2][c2])
{
    if (c1 != r2)
    {
        printf("Multiplication not possible");
    }
    int c[r1][c2];
    for (int i = 0; i < r1; i++)
    {
        for (int j = 0; j < c2; j++)
        {
            c[i][j] = 0;
            for (int k = 0; k < c1; k++)
            {
                c[i][j] += matrix1[i][k] * matrix2[k][j];
            }
        }
    }
    // printing mult matrix
    for (int i = 0; i < r1; i++)
    {
        for (int j = 0; j < c1; j++)
        {
            printf("%d ", c[i][j]);
        }
        printf("\n");
    }
};

int main()
{
    int r1, c1;
    printf("Enter the number of rows for matrix 1: ");
    scanf("%d", &r1);
    printf("Enter the number of columns for matrix 1: ");
    scanf("%d", &c1);
    int matrix1[r1][c1];
    for (int i = 0; i < r1; i++)
```

```
{
   for (int j = 0; j < c1; j++)
   {
      printf("Input element's value: ");
      scanf("%d", &matrix1[i][j]);
   }
}

int r2, c2;
printf("Enter the number of rows for matrix 2: ");
scanf("%d", &r2);
printf("Enter the number of columns for matrix 2: ");
scanf("%d", &c2);
int matrix2[r2][c2];
for (int i = 0; i < r1; i++)
{
   for (int j = 0; j < c1; j++)
   {
      printf("Input element's value: ");
      scanf("%d", &matrix2[i][j]);
   }
}
//printing matrices
printf("\nMatrix 1:\n");
for (int i = 0; i < r1; i++)
{
   for (int j = 0; j < c1; j++)
   {
      printf("%d ", matrix1[i][j]);
   }
   printf("\n");
```

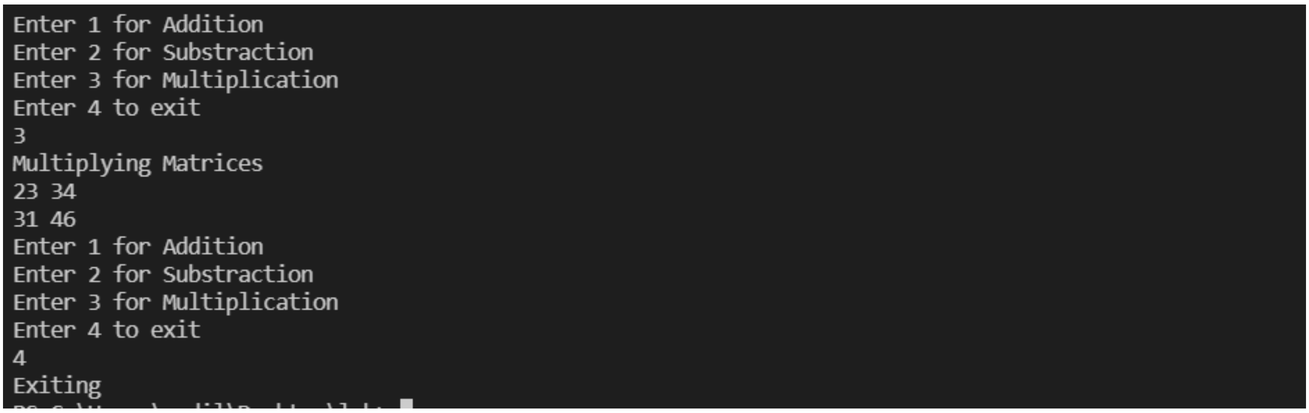
```
}

printf("\nMatrix 2:\n");
for (int i = 0; i < r2; i++)
{
   for (int j = 0; j < c2; j++)
   {
      printf("%d ", matrix2[i][j]);
   }
   printf("\n");
}
while (1)
{
   int ch;
   printf("Enter 1 for Addition\n");
   printf("Enter 2 for Substraction\n");
   printf("Enter 3 for Multiplication\n");
   printf("Enter 4 to exit\n");
   scanf("%d", &ch);
   switch (ch)
   {
   case 1:
      printf("Adding Matrices\n");
      add(r1, c1, r2, c2, matrix1, matrix2);
      break;
   case 2:
      printf("Substracting Matrices\n");
      sub(r1, c1, r2, c2, matrix1, matrix2);
      break;
   case 3:
      printf("Multiplying Matrices\n");
```

```
            mult(r1, c1, r2, c2, matrix1, matrix2);
            break;
        case 4:
            printf("Exiting\n");
            exit(0);
        default:
            printf("Invalid Input\n");
        }
    }

    return 0;
}
```

OUTPUT



```
PS C:\Users\aadil\Desktop\lab> cd "c:\Users\aadil\Desktop\lab\" ; if ($?) { gcc program1.c -o program1 } ;
Enter the number of rows for matrix 1: 2
Enter the number of columns for matrix 1: 2
Input element's value: 5
Input element's value: 6
Input element's value: 7
Input element's value: 8
Enter the number of rows for matrix 2: 2
Enter the number of columns for matrix 2: 2
Input element's value: 1
Input element's value: 2
Input element's value: 3
Input element's value: 4

Matrix 1:
5 6
7 8

Matrix 2:
1 2
3 4
Enter 1 for Addition
Enter 2 for Substraction
Enter 3 for Multiplication
Enter 4 to exit
1
Adding Matrices
6 8
10 12
Enter 1 for Addition
Enter 2 for Substraction
Enter 3 for Multiplication
Enter 4 to exit
2
Substracting Matrices
4 4
4 4
```



```
Enter 1 for Addition
Enter 2 for Substraction
Enter 3 for Multiplication
Enter 4 to exit
3
Multiplying Matrices
23 34
31 46
Enter 1 for Addition
Enter 2 for Substraction
Enter 3 for Multiplication
Enter 4 to exit
4
Exiting
```

20BCS042 MOHD ADIL

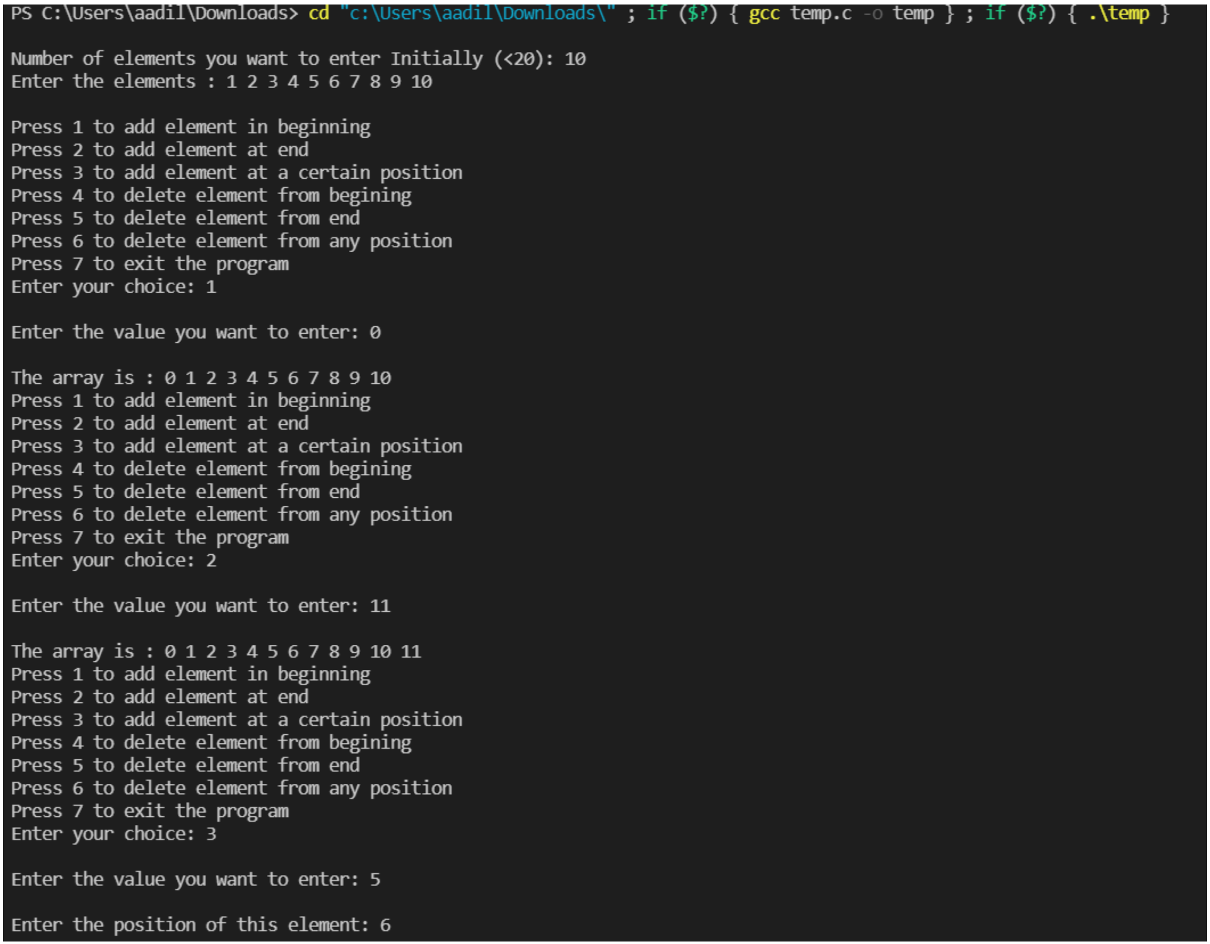
```
#include <stdio.h>
#include <stdlib.h>
int A[20];
int Size;

void print();
void Insert1();
void Insert2();
void Insert3();
void Delete1();
void Delete2();
void Delete3();

int main(){

  printf("\nNumber of elements you want to enter Initially (<20): ");
  scanf("%d", &Size);

  printf("Enter the elements : ");
  for(int i=0; i<Size; i++){
    scanf("%d", &A[i]);
  }
  while(1){
    printf("\nPress 1 to add element in beginning");
    printf("\nPress 2 to add element at end");
    printf("\nPress 3 to add element at a certain position");
    printf("\nPress 4 to delete element from begining");
    printf("\nPress 5 to delete element from end");
    printf("\nPress 6 to delete element from any position");
    printf("\nPress 7 to exit the program");
```

```
        printf("\nEnter your choice: ");
        int ch;
        scanf("%d", &ch);
        switch(ch){
          case 1 : Insert1();
                   print();
                   break;
          case 2 : Insert2();
                   print();
                   break;
          case 3 : Insert3();
                   print();
                   break;
          case 4 : Delete1();
                   print();
                   break;
          case 5 : Delete2();
                   print();
                   break;
          case 6 :  Delete3();
                   print();
                   break;
          case 7 : printf("\nExiting from the program!");
                   exit(0);
          default : printf("\nWrong choice!");
                    break;
        }
    }
    return 0;
}
void print(){
    printf("\nThe array is : ");

    for(int i=0; i<Size; i++){
        printf("%d ", A[i]);
    }
}
void Insert1(){
    if(Size>=20){
        printf("\nSize Overflow!!");
        return;
    }
    int v;
    printf("\nEnter the value you want to enter: ");
    scanf("%d", &v);

    for(int i=Size-1; i>=0; i--){
        A[i+1]=A[i];
    }
    A[0] = v;
    Size++;
}
void Insert2(){
    if(Size>=20){
        printf("\nSize Overflow!!");
        return;
    }
    int v;
    printf("\nEnter the value you want to enter: ");
    scanf("%d", &v);
    A[Size] = v;
    Size++;
```

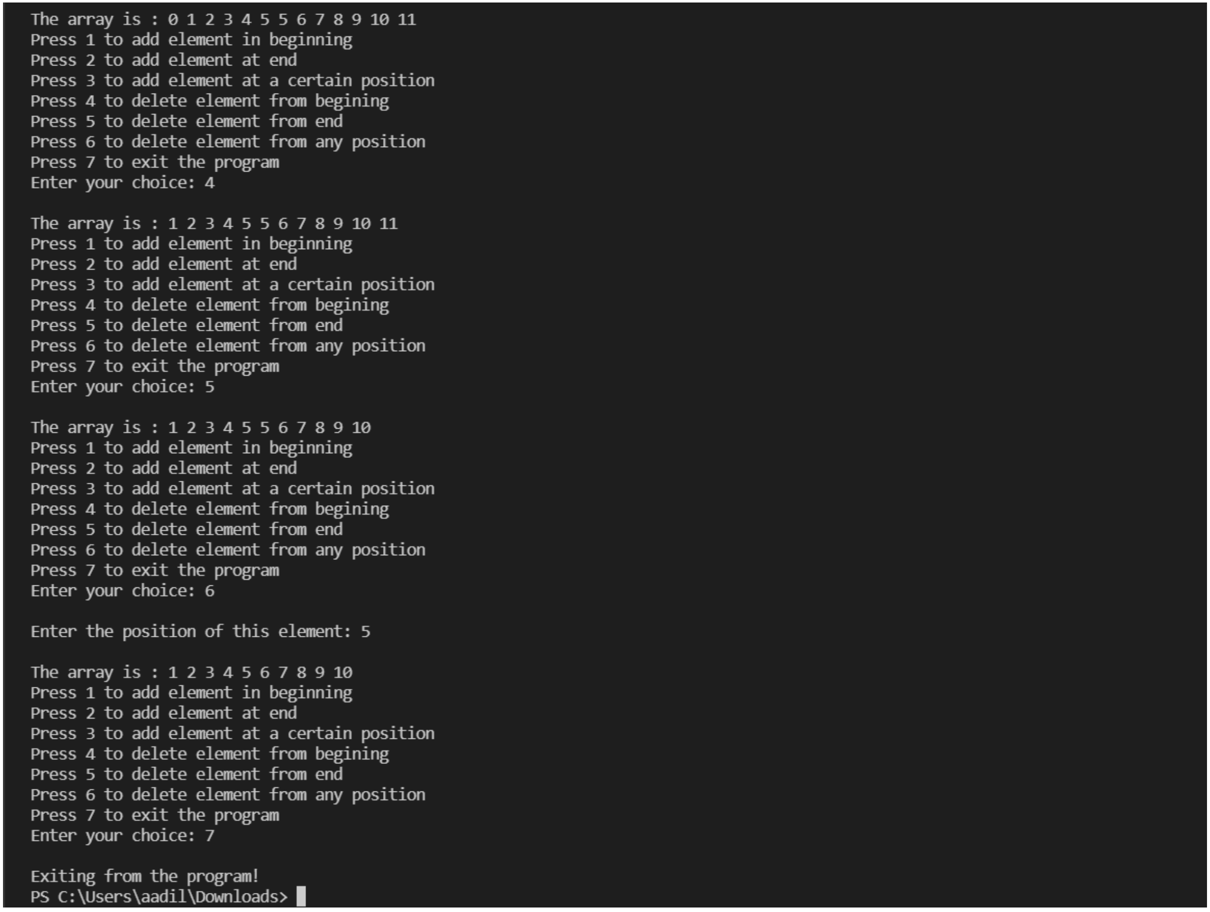
```
}
void Insert3(){
   if(Size>=20){
      printf("\nSize Overflow!!");
      return;
   }
   int v, pos;
   printf("\nEnter the value you want to enter: ");
   scanf("%d", &v);
   printf("\nEnter the position of this element: ");
   scanf("%d", &pos);

   for(int i=Size-1; i>=pos-1; i--){
      A[i+1]=A[i];
}
   A[pos-1]= v;
   Size++;
}
void Delete1(){
   if(Size<=0){
      printf("\nSize underflow!!");
      return;
   }
   for(int i=0; i<Size-1; i++){
      A[i] = A[i+1];
   }
   Size--;
}
void Delete2(){
   if(Size<=0){
      printf("\nSize underflow!!");
```

```
        return;
    }
    Size--;
}
void Delete3(){
    if(Size<=0){
        printf("\nSize underflow!!");
        return;
    }
    int pos;
    printf("\nEnter the position of this element: ");
    scanf("%d", &pos);

    for(int i=pos-1; i<Size-1; i++){
        A[i] = A[i+1];
    }
    Size--;
}
```

OUTPUT



```
PS C:\Users\aadil\Downloads> cd "c:\Users\aadil\Downloads\" ; if ($?) { gcc temp.c -o temp } ; if ($?) { .\temp }

Number of elements you want to enter Initially (<20): 10
Enter the elements : 1 2 3 4 5 6 7 8 9 10

Press 1 to add element in beginning
Press 2 to add element at end
Press 3 to add element at a certain position
Press 4 to delete element from begining
Press 5 to delete element from end
Press 6 to delete element from any position
Press 7 to exit the program
Enter your choice: 1

Enter the value you want to enter: 0

The array is : 0 1 2 3 4 5 6 7 8 9 10
Press 1 to add element in beginning
Press 2 to add element at end
Press 3 to add element at a certain position
Press 4 to delete element from begining
Press 5 to delete element from end
Press 6 to delete element from any position
Press 7 to exit the program
Enter your choice: 2

Enter the value you want to enter: 11

The array is : 0 1 2 3 4 5 6 7 8 9 10 11
Press 1 to add element in beginning
Press 2 to add element at end
Press 3 to add element at a certain position
Press 4 to delete element from begining
Press 5 to delete element from end
Press 6 to delete element from any position
Press 7 to exit the program
Enter your choice: 3

Enter the value you want to enter: 5

Enter the position of this element: 6
```



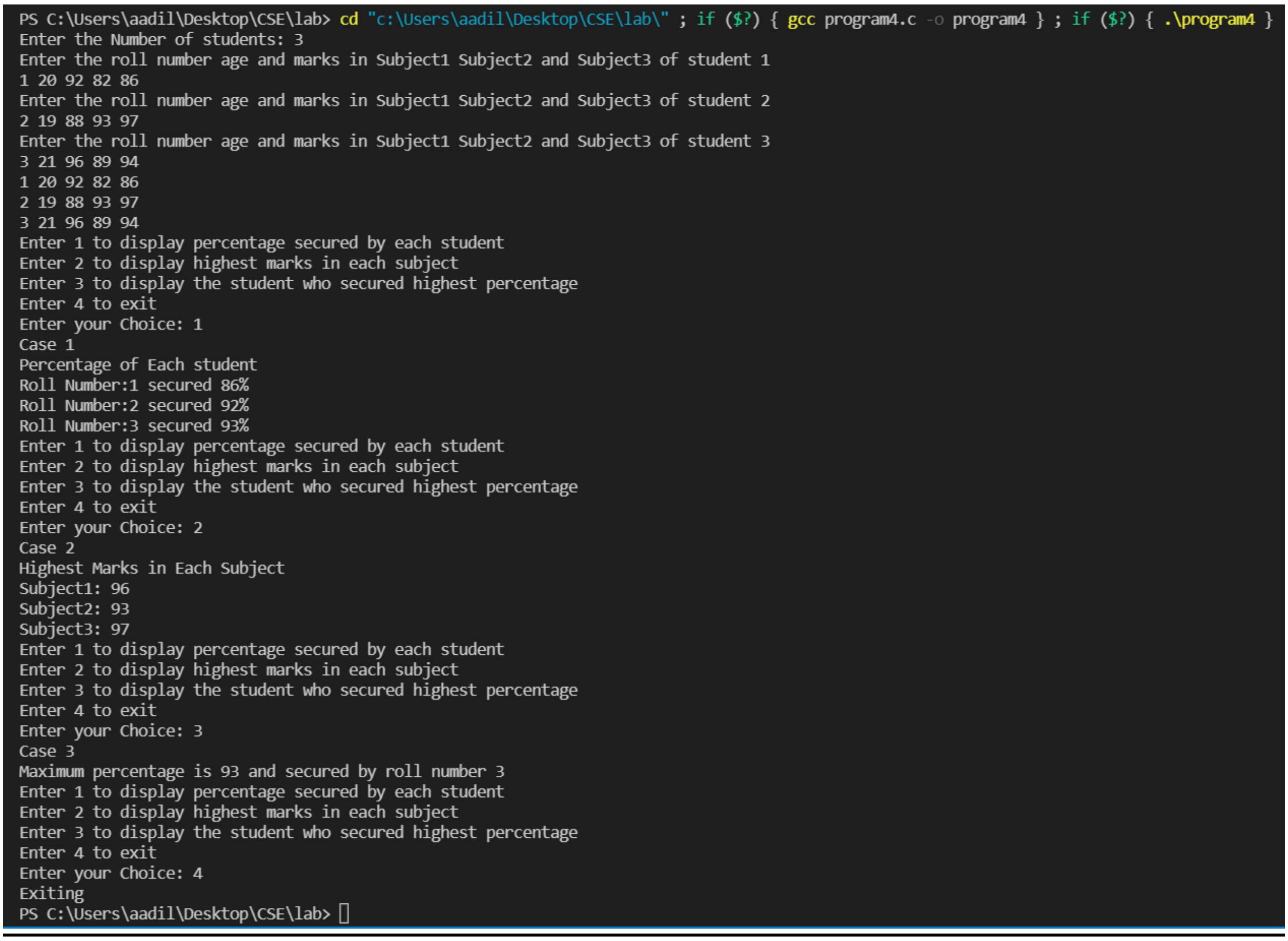
```
The array is : 0 1 2 3 4 5 5 6 7 8 9 10 11
Press 1 to add element in beginning
Press 2 to add element at end
Press 3 to add element at a certain position
Press 4 to delete element from begining
Press 5 to delete element from end
Press 6 to delete element from any position
Press 7 to exit the program
Enter your choice: 4

The array is : 1 2 3 4 5 5 6 7 8 9 10 11
Press 1 to add element in beginning
Press 2 to add element at end
Press 3 to add element at a certain position
Press 4 to delete element from begining
Press 5 to delete element from end
Press 6 to delete element from any position
Press 7 to exit the program
Enter your choice: 5

The array is : 1 2 3 4 5 5 6 7 8 9 10
Press 1 to add element in beginning
Press 2 to add element at end
Press 3 to add element at a certain position
Press 4 to delete element from begining
Press 5 to delete element from end
Press 6 to delete element from any position
Press 7 to exit the program
Enter your choice: 6

Enter the position of this element: 5

The array is : 1 2 3 4 5 6 7 8 9 10
Press 1 to add element in beginning
Press 2 to add element at end
Press 3 to add element at a certain position
Press 4 to delete element from begining
Press 5 to delete element from end
Press 6 to delete element from any position
Press 7 to exit the program
Enter your choice: 7

Exiting from the program!
PS C:\Users\aadil\Downloads> 
```

20BCS042 MOHD ADIL

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

int st;
int percentage(int i, int arr[i][5])
{
    int percentage = (arr[i][2] + arr[i][3] + arr[i][4]) / 3;
    return percentage;
}
int maxins1(int arr[st][5])
{
    int maxs1 = 0;
    for (int i = 0; i < st; i++)
    {
        if (arr[i][2] > maxs1)
        {
            maxs1 = arr[i][2];
        }
    }
    return maxs1;
}
int maxins2(int arr[st][5])
{
    int maxs2 = 0;
    for (int i = 0; i < st; i++)
    {
        if (arr[i][3] > maxs2)
        {
            maxs2 = arr[i][3];
        }
    }
    return maxs2;
}
int maxins3(int arr[st][5])
{
    int maxs3 = 0;
    for (int i = 0; i < st; i++)
    {
        if (arr[i][4] > maxs3)
        {
            maxs3 = arr[i][4];
        }
    }
    return maxs3;
}
int main()
{

    printf("Enter the Number of students: ");
    scanf("%d", &st);
    int arr[st][5];
    for (int i = 0; i < st; i++)
    {
        printf("Enter the roll number age and marks in Subject1 Subject2 and Subject3 of student %d\n", i + 1);
        for (int j = 0; j < 5; j++)
        {
            scanf("%d", &arr[i][j]);
        }
    }
    for (int i = 0; i < st; i++)
    {

        for (int j = 0; j < 5; j++)
        {
            printf("%d ", arr[i][j]);
        }
        printf("\n");
    }

    while (1)
    {
        int ch;
        printf("Enter 1 to display percentage secured by each student\n");
        printf("Enter 2 to display highest marks in each subject\n");
        printf("Enter 3 to display the student who secured highest percentage\n");
        printf("Enter 4 to exit\n");
        printf("Enter your Choice: ");
        scanf("%d", &ch);
        switch (ch)
        {
        case 1:
            printf("Case 1\n");
            printf("Percentage of Each student\n");
            for (int i = 0; i < st; i++)
            {
                printf("Roll Number:%d secured %d%c\n", arr[i][0], percentage(i, arr), 37);
            }
            break;
        case 2:
            printf("Case 2\n");
            printf("Highest Marks in Each Subject\n");
            printf("Subject1: %d\n", maxins1(arr));
            printf("Subject2: %d\n", maxins2(arr));
            printf("Subject3: %d\n", maxins3(arr));


            break;
        case 3:
            printf("Case 3\n");
            int mp = 0;
            int t = 0;
            for (int i = 0; i < st; i++)
            {
                if (percentage(i, arr) > mp)
                {
                    mp = percentage(i, arr);
                    t = arr[i][0];
                }
            }
            printf("Maximum percentage is %d and secured by roll number %d\n", mp, t);
            break;
        case 4:
            printf("Exiting\n");
            exit(0);
        }
    }
```

```
    return 0;

}
```

OUTPUT



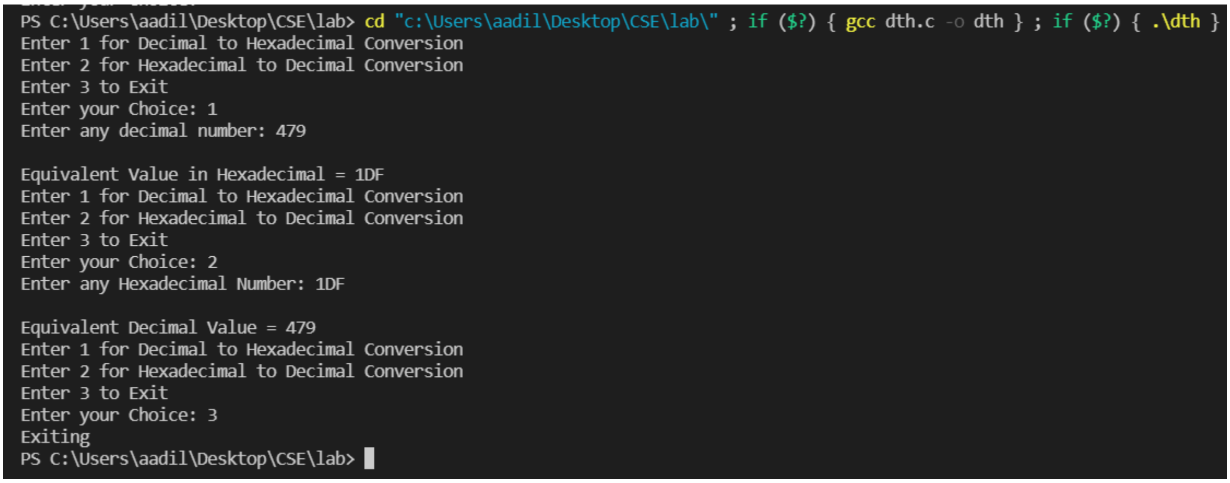
```
PS C:\Users\aadil\Desktop\CSE\lab> cd "c:\Users\aadil\Desktop\CSE\lab\" ; if ($?) { gcc program4.c -o program4 } ; if ($?) { .\program4 }
Enter the Number of students: 3
Enter the roll number age and marks in Subject1 Subject2 and Subject3 of student 1
1 20 92 82 86
Enter the roll number age and marks in Subject1 Subject2 and Subject3 of student 2
2 19 88 93 97
Enter the roll number age and marks in Subject1 Subject2 and Subject3 of student 3
3 21 96 89 94
1 20 92 82 86
2 19 88 93 97
3 21 96 89 94
Enter 1 to display percentage secured by each student
Enter 2 to display highest marks in each subject
Enter 3 to display the student who secured highest percentage
Enter 4 to exit
Enter your Choice: 1
Case 1
Percentage of Each student
Roll Number:1 secured 86%
Roll Number:2 secured 92%
Roll Number:3 secured 93%
Enter 1 to display percentage secured by each student
Enter 2 to display highest marks in each subject
Enter 3 to display the student who secured highest percentage
Enter 4 to exit
Enter your Choice: 2
Case 2
Highest Marks in Each Subject
Subject1: 96
Subject2: 93
Subject3: 97
Enter 1 to display percentage secured by each student
Enter 2 to display highest marks in each subject
Enter 3 to display the student who secured highest percentage
Enter 4 to exit
Enter your Choice: 3
Case 3
Maximum percentage is 93 and secured by roll number 3
Enter 1 to display percentage secured by each student
Enter 2 to display highest marks in each subject
Enter 3 to display the student who secured highest percentage
Enter 4 to exit
Enter your Choice: 4
Exiting
PS C:\Users\aadil\Desktop\CSE\lab> 
```

20BCS042 MOHD ADIL

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



void dectohex();
void hextodec();
int power(int a, int b);

int main()
{
    while (1)
    {
        int ch;
        printf("Enter 1 for Decimal to Hexadecimal Conversion\n");
        printf("Enter 2 for Hexadecimal to Decimal Conversion\n");
        printf("Enter 3 to Exit\n");
        printf("Enter your Choice: ");
        scanf("%d", &ch);
        switch (ch)
        {
        case 1:
            dectohex();
            break;
        case 2:
            hextodec();
            break;
        case 3:
            printf("Exiting\n");
            exit(0);
        }
    }

    return 0;
}

int power(int a, int b)
{
    int pow = 1;
    for (int i = 1; i <= b; i++)
    {
        pow = pow * a;
    }
    return pow;
}

void dectohex()
{
    int decimalNum, remainder, i = 0;
    char hexnum[20];
    printf("Enter any decimal number: ");
    scanf("%d", &decimalNum);
    while (decimalNum != 0)
    {
        remainder = decimalNum % 16;
        if (remainder < 10)
            remainder = remainder + 48;
        else
```

```
            remainder = remainder + 55;
        hexnum[i] = remainder;
        i++;
        decimalNum = decimalNum / 16;
    }
    printf("\nEquivalent Value in Hexadecimal = ");
    for (i = i - 1; i >= 0; i--)
        printf("%c", hexnum[i]);
    printf("\n");
}

void hextodec()
{
    int decimalNum = 0, remainder, i = 0, len = 0;
    char hexnum[20];
    printf("Enter any Hexadecimal Number: ");
    scanf("%s", hexnum);
    while (hexnum[i] != '\0')
    {
        len++;
        i++;
    }
    len--;
    i = 0;
    while (len >= 0)
    {
        remainder = hexnum[len];
        if (remainder >= 48 && remainder <= 57)
            remainder = remainder - 48;
        else if (remainder >= 65 && remainder <= 70)

            remainder = remainder - 55;

        else if (remainder >= 97 && remainder <= 102)

            remainder = remainder - 87;

        else

        {

            printf("\nYou've entered an invalid Hexadecimal digit");

        }

        decimalNum = decimalNum + (remainder * power(16, i));

        len--;

        i++;

    }

    printf("\nEquivalent Decimal Value = %d\n", decimalNum);

}
```

OUTPUT



```
PS C:\Users\aadil\Desktop\CSE\lab> cd "c:\Users\aadil\Desktop\CSE\lab\" ; if ($?) { gcc dth.c -o dth } ; if ($?) { .\dth }
Enter 1 for Decimal to Hexadecimal Conversion
Enter 2 for Hexadecimal to Decimal Conversion
Enter 3 to Exit
Enter your Choice: 1
Enter any decimal number: 479

Equivalent Value in Hexadecimal = 1DF
Enter 1 for Decimal to Hexadecimal Conversion
Enter 2 for Hexadecimal to Decimal Conversion
Enter 3 to Exit
Enter your Choice: 2
Enter any Hexadecimal Number: 1DF

Equivalent Decimal Value = 479
Enter 1 for Decimal to Hexadecimal Conversion
Enter 2 for Hexadecimal to Decimal Conversion
Enter 3 to Exit
Enter your Choice: 3
Exiting
PS C:\Users\aadil\Desktop\CSE\lab> █
```

20BCS042 MOHD ADIL

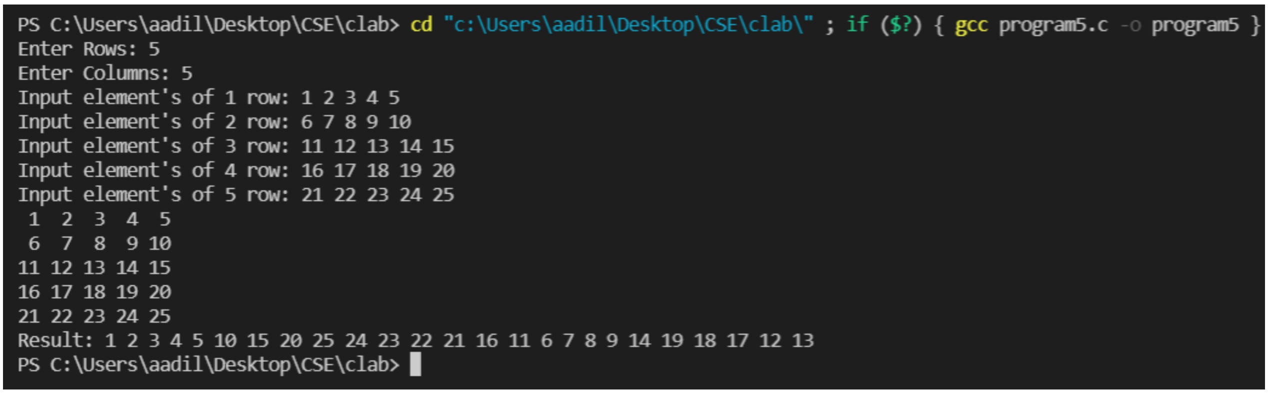
PROGRAM:

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

int r, c;
void display(int Matrix[r][c])
{
   for (int i = 0; i < r; i++)
   {
      for (int j = 0; j < c; j++)
      {
         if (Matrix[i][j] < 10)
         {
            printf(" %d ", Matrix[i][j]);
         }
         else
         {
            printf("%d ", Matrix[i][j]);
         }
      }
      printf("\n");
   }
}
void helical(int Matrix[r][c])
{
   int k = 0, l = 0;
   int last_row = r - 1, last_col = c - 1;
   printf("Result: ");
```

```
while (k <= last_row && l <= last_col)
{
    for (int i = l; i <= last_col; i++)
    {
        printf("%d ", Matrix[k][i]);
    }
    k++;
    for (int i = k; i <= last_row; i++)
    {
        printf("%d ", Matrix[i][last_col]);
    }
    last_col--;
    if (k <= last_row)
    {
        for (int i = last_col; i >= l; i--)
        {
            printf("%d ", Matrix[last_row][i]);
        }
        last_row--;
    }
    if (l <= last_col)
    {
        for (int i = last_row; i >= k; i--)
        {
            printf("%d ", Matrix[i][l]);
        }
        l++;
    }
}
```

```
}
int main()
{

    printf("Enter Rows: ");
    scanf("%d", &r);
    printf("Enter Columns: ");
    scanf("%d", &c);
    int Matrix[r][c];
    for (int i = 0; i < r; i++)
    {
        printf("Input element's of %d row: ", i + 1);
        for (int j = 0; j < c; j++)
        {
            scanf("%d", &Matrix[i][j]);
        }
    }
    display(Matrix);
    helical(Matrix);

    return 0;
}
```

OUTPUT



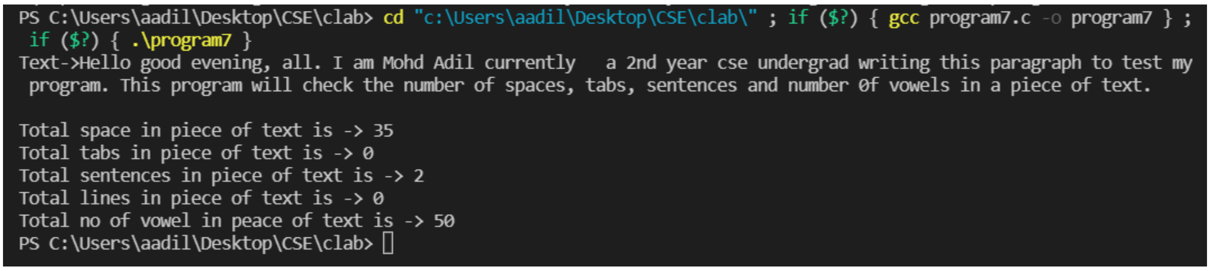
```
PS C:\Users\aadil\Desktop\CSE\clab> cd "c:\Users\aadil\Desktop\CSE\clab\" ; if ($?) { gcc program5.c -o program5 }
Enter Rows: 5
Enter Columns: 5
Input element's of 1 row: 1 2 3 4 5
Input element's of 2 row: 6 7 8 9 10
Input element's of 3 row: 11 12 13 14 15
Input element's of 4 row: 16 17 18 19 20
Input element's of 5 row: 21 22 23 24 25
 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
Result: 1 2 3 4 5 10 15 20 25 24 23 22 21 16 11 6 7 8 9 14 19 18 17 12 13
PS C:\Users\aadil\Desktop\CSE\clab> 
```

20BCS042 MOHD ADIL

```
#include <stdio.h>


int main()
{
   char text[1000];
   printf("Text->");
   gets(text);
   int spaces = 0, tabs = 0, sentences = 0, lines = 0, vowels = 0;
   for (int i = 0; text[i] != '0'; i++)
   {
      if (text[i] == ' ')
      {
         ++spaces;
      }
      else if (text[i] == '\t')
      {
         tabs++;
      }
      if (text[i] == '.')
      {
         sentences++;
      }
      else if (text[i] == '\n')
      {
         lines++;
      }
      else if (text[i] == 'a' || text[i] == 'e' || text[i] == 'i' || text[i] == 'o' || text[i] == 'u' ||
             text[i] == 'A' || text[i] == 'E' || text[i] == 'I' || text[i] == 'O' || text[i] == 'U')
      {
         vowels++;
      }
   }
```

```
    printf("\nTotal space in piece of text is -> %d", spaces);

    printf("\nTotal tabs in piece of text is -> %d", tabs);

    printf("\nTotal sentences in piece of text is -> %d", sentences);

    printf("\nTotal lines in piece of text is -> %d", lines);

    printf("\nTotal no of vowel in peace of text is -> %d", vowels);

    return 0;

}
```

OUTPUT:



```
PS C:\Users\aadil\Desktop\CSE\clab> cd "c:\Users\aadil\Desktop\CSE\clab\" ; if ($?) { gcc program7.c -o program7 } ;
 if ($?) { .\program7 }
Text->Hello good evening, all. I am Mohd Adil currently   a 2nd year cse undergrad writing this paragraph to test my
 program. This program will check the number of spaces, tabs, sentences and number 0f vowels in a piece of text.

Total space in piece of text is -> 35
Total tabs in piece of text is -> 0
Total sentences in piece of text is -> 2
Total lines in piece of text is -> 0
Total no of vowel in peace of text is -> 50
PS C:\Users\aadil\Desktop\CSE\clab> 
```

20BCS042 MOHD ADIL

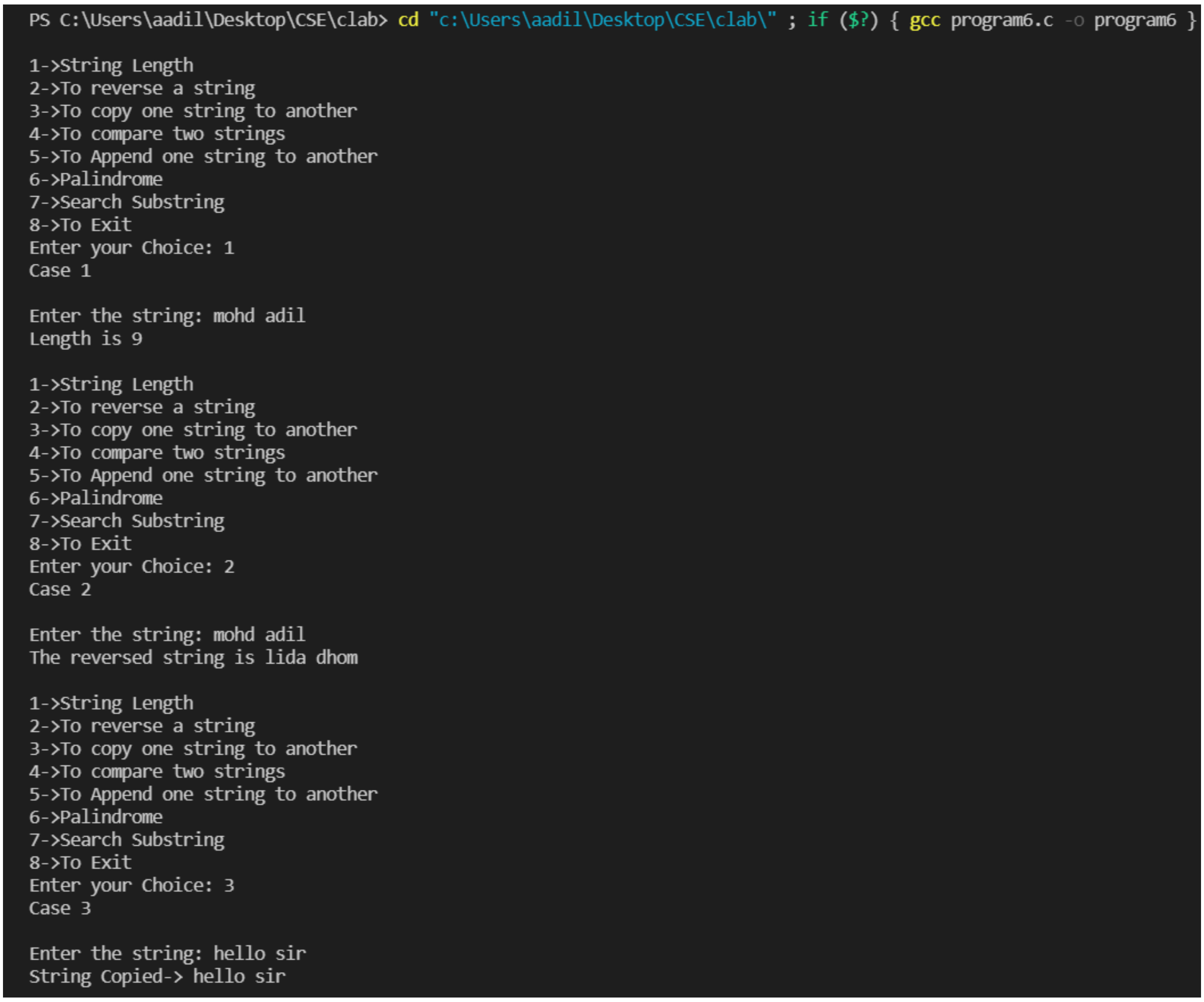
PROGRAM:

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

char string[100];
int strlength(char string[])
{
    int count = 0;
    while (string[count] != '\0')
    {
        count++;
    }
    return count;
}
void reverse(char string[])
{
    int len = strlength(string);
    for (int i = 0; i < len / 2; i++)
    {
        char temp = string[i];
        string[i] = string[len - i - 1];
        string[len - i - 1] = temp;
    }
    printf("The reversed string is %s\n", string);
}

void strcopy(char string[], char new[])
{
    int len = strlength(string);
    int i;
    for (i = 0; i < len; i++)
    {
        new[i] = string[i];
    }
    new[i] = '\0';
    printf("String Copied-> %s\n", new);
}
void strcompare(char string1[], char string2[])
{
    int len1 = strlength(string1);
    int len2 = strlength(string2);
    if (len1 != len2)
    {
        printf("Strings are not Equal\n");
    }
    else
    {
        int flag;
        for (int i = 0; i < len1; i++)
        {
            if (string1[i] == string2[i])
            {
                flag = 1;
            }
            else
            {
                flag = 0;
            }
        }
        if (flag == 0)
        {
            printf("Strings are not Equal\n");
        }
        else
        {
            printf("Strings are Equal\n");
        }
    }
}
void strappend(char string[], char Append[])
{
    int len = strlength(string);
    int len1 = strlength(Append);
    int i;
    for (i = 0; i < len1; i++)
    {
        string[len + i] = Append[i];
    }
    string[len + i] = '\0';
    printf("The new string is %s\n", string);
}
void checkpalindrome(char string[])
{
    int len = strlength(string);
    int flag;
    for (int i = 0; i < len / 2; i++)
    {
        if (string[i] == string[len - i - 1])
        {
            flag = 1;
        }
        else
        {
            flag = 0;
        }
    }
    if (flag == 1)
    {
        printf("Yes\n");
    }
    else
    {
        printf("No\n");
    }
}

int findsubstring(char string[], char substring[])
{
    int m = strlength(string);
    int n = strlength(substring);
    for (int i = 0; i <= m - n; i++)
    {
        int j;
        for (j = 0; j < n; j++)
        {
            if (string[i + j] != substring[j])
            {
                break;
            }
        }
        if (j == n)
            return i;
    }
    return -1;
}
int main()
{
    while (1)
    {
        int ch;
```

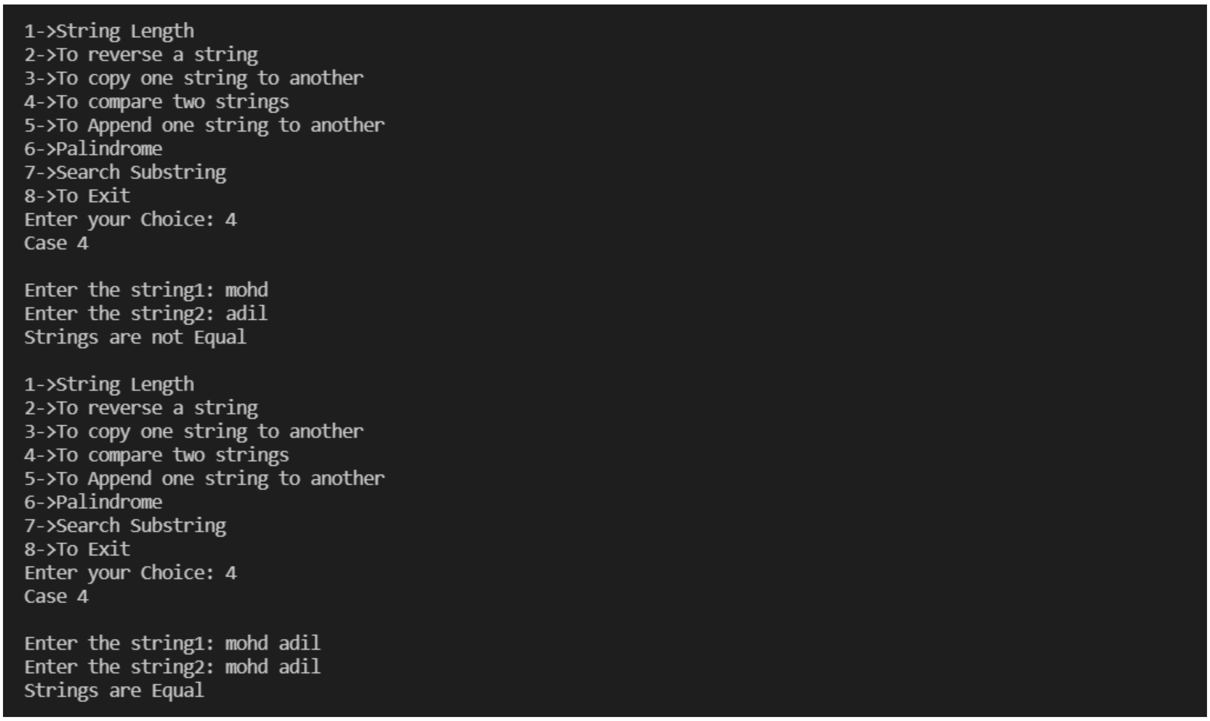
```
printf("\n1->String Length\n");
printf("2->To reverse a string\n");
printf("3->To copy one string to another\n");
printf("4->To compare two strings\n");
printf("5->To Append one string to another\n");
printf("6->Palindrome\n");
printf("7->Search Substring\n");
printf("8->To Exit\n");
printf("Enter your Choice: ");
scanf("%d", &ch);
getchar();
switch (ch)
{
case 1:
    printf("Case 1\n\n");
    printf("Enter the string: ");
    gets(string);
    printf("Length is %d\n", strlength(string));
    break;
case 2:
    printf("Case 2\n\n");
    printf("Enter the string: ");
    gets(string);
    reverse(string);
    break;
case 3:
    printf("Case 3\n\n");
    printf("Enter the string: ");
    gets(string);
    char new[100];
    strcopy(string, new);
    break;
case 4:
    printf("Case 4\n\n");
    printf("Enter the string1: ");
    char string1[100];
    gets(string1);
    printf("Enter the string2: ");
    char string2[100];
    gets(string2);
    strcompare(string1, string2);
    break;
case 5:
    printf("Case 5\n\n");
    printf("Enter the string: ");
    gets(string);
    printf("Enter the new string to append: ");
    char Add[100];
    gets(Add);
    strappend(string, Add);
    break;
case 6:
    printf("Case 6\n\n");
    printf("Enter the string: ");
    gets(string);
    checkpalindrome(string);
    break;
case 7:
    printf("Case 7\n\n");
    printf("Enter the string: ");
    gets(string);
    printf("Enter the substring: ");
    char substring[100];
    gets(substring);
    if (findsubstring(string,substring)!=-1)
        printf("\"%s\" is a substring of \"%s\" at index %d\n",substring,string,findsubstring(string,substring));
```

```
            else
                printf("String is not present\n");
            break;
        case 8:
            printf("\nExiting\n");
            exit(0);
        default:
            printf("Wrong Input\n");
        }
    }
    return 0;
}
```

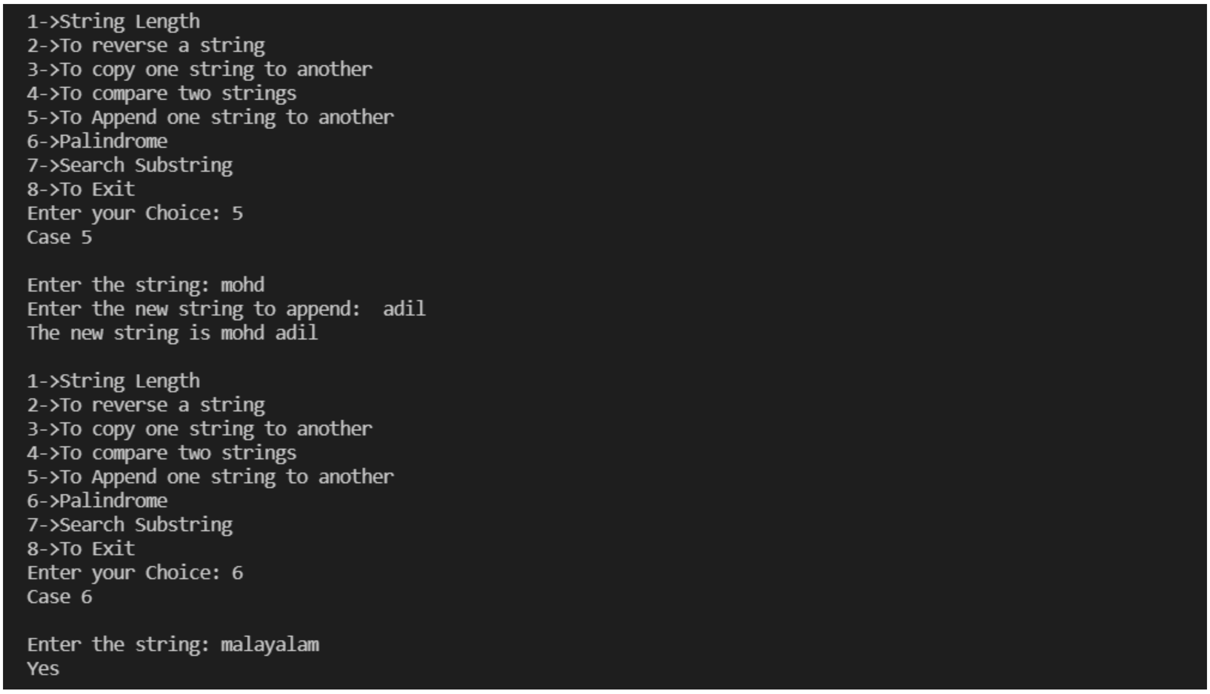
OUTPUT:



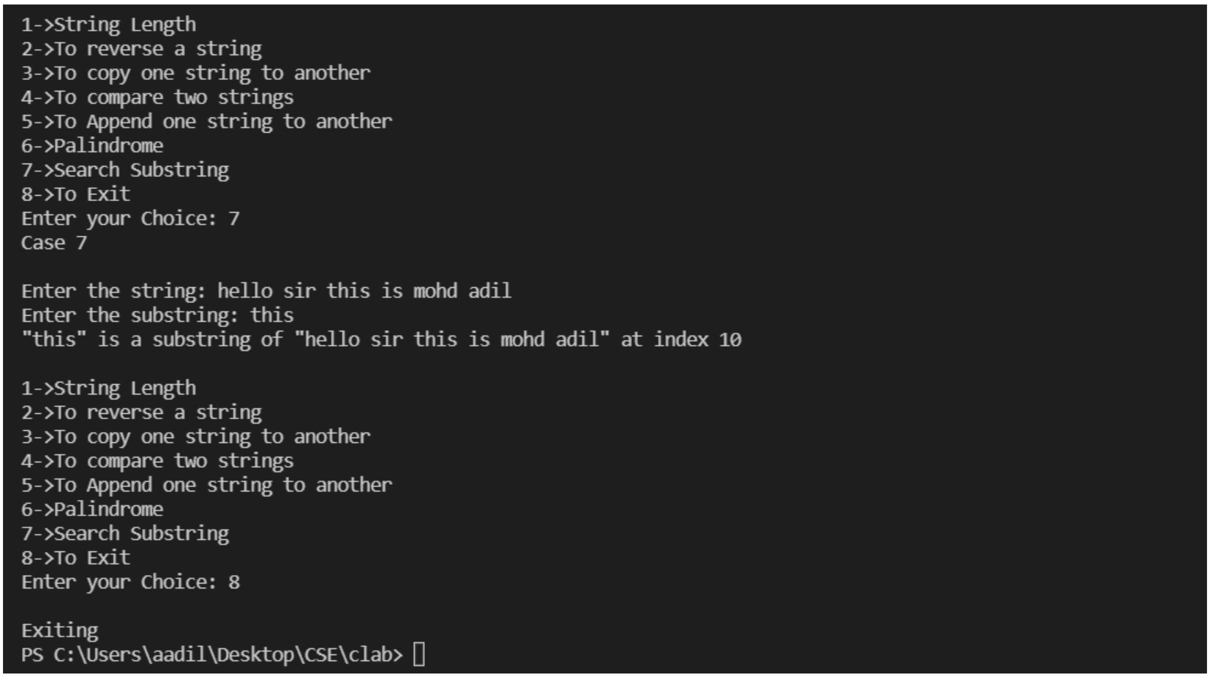
```
PS C:\Users\aadil\Desktop\CSE\clab> cd "c:\Users\aadil\Desktop\CSE\clab\" ; if ($?) { gcc program6.c -o program6 }

1->String Length
2->To reverse a string
3->To copy one string to another
4->To compare two strings
5->To Append one string to another
6->Palindrome
7->Search Substring
8->To Exit
Enter your Choice: 1
Case 1

Enter the string: mohd adil
Length is 9

1->String Length
2->To reverse a string
3->To copy one string to another
4->To compare two strings
5->To Append one string to another
6->Palindrome
7->Search Substring
8->To Exit
Enter your Choice: 2
Case 2

Enter the string: mohd adil
The reversed string is lida dhom

1->String Length
2->To reverse a string
3->To copy one string to another
4->To compare two strings
5->To Append one string to another
6->Palindrome
7->Search Substring
8->To Exit
Enter your Choice: 3
Case 3

Enter the string: hello sir
String Copied-> hello sir
```



```
1->String Length
2->To reverse a string
3->To copy one string to another
4->To compare two strings
5->To Append one string to another
6->Palindrome
7->Search Substring
8->To Exit
Enter your Choice: 4
Case 4

Enter the string1: mohd
Enter the string2: adil
Strings are not Equal

1->String Length
2->To reverse a string
3->To copy one string to another
4->To compare two strings
5->To Append one string to another
6->Palindrome
7->Search Substring
8->To Exit
Enter your Choice: 4
Case 4

Enter the string1: mohd adil
Enter the string2: mohd adil
Strings are Equal
```



```
1->String Length
2->To reverse a string
3->To copy one string to another
4->To compare two strings
5->To Append one string to another
6->Palindrome
7->Search Substring
8->To Exit
Enter your Choice: 5
Case 5

Enter the string: mohd
Enter the new string to append:  adil
The new string is mohd adil

1->String Length
2->To reverse a string
3->To copy one string to another
4->To compare two strings
5->To Append one string to another
6->Palindrome
7->Search Substring
8->To Exit
Enter your Choice: 6
Case 6

Enter the string: malayalam
Yes
```



```
1->String Length
2->To reverse a string
3->To copy one string to another
4->To compare two strings
5->To Append one string to another
6->Palindrome
7->Search Substring
8->To Exit
Enter your Choice: 7
Case 7

Enter the string: hello sir this is mohd adil
Enter the substring: this
"this" is a substring of "hello sir this is mohd adil" at index 10

1->String Length
2->To reverse a string
3->To copy one string to another
4->To compare two strings
5->To Append one string to another
6->Palindrome
7->Search Substring
8->To Exit
Enter your Choice: 8

Exiting
PS C:\Users\aadil\Desktop\CSE\clab> ▯
```

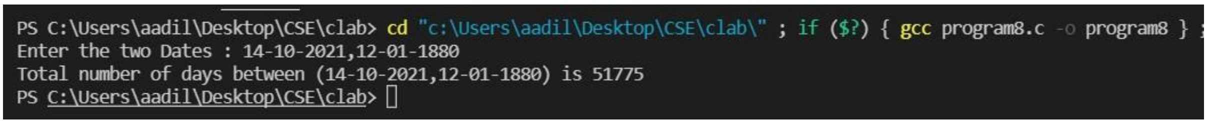
THANK YOU.

20BCS042 MOHD ADIL

PROGRAM 8:

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

int daysafterNmonths[12] = {31, 59, 90, 120, 151, 181, 212, 243,
273, 304, 334, 365};
int leapyear(int m,int y)//from 0 year to y years
{
   if (m<=2)
   {
       y--;
   }
   return (y / 4) - (y / 100) + (y / 400);
}
int main()
{
    int d1 = 0, m1 = 0, y1 = 0;
    int d2 = 0, m2 = 0, y2 = 0;
    char date[21];
    printf("Enter the two Dates : ");
    gets(date);
    int i = 0;
    while (date[i] != '-')
    {
        d1 = d1 * 10 + date[i] - '0';
        i++;
    }
    while (date[i] == '-')
    {
        i++;
    }
    while (date[i] != '-')
    {
        m1 = m1 * 10 + date[i] - '0';
        i++;
    }
    while (date[i] == '-')
    {
        i++;
    }
    while (date[i] != ',')
    {
        y1 = y1 * 10 + date[i] - '0';
        i++;
    }
    while (date[i] == ',')
    {
        i++;
    }
    while (date[i] != '-')
    {
        d2 = d2 * 10 + date[i] - '0';
        i++;
    }
    while (date[i] == '-')
    {
        i++;
    }
    while (date[i] != '-')
    {
        m2 = m2 * 10 + date[i] - '0';
        i++;
    }
    while (date[i] == '-')
    {
        i++;
    }
    while (i < 21)
    {
        y2 = y2 * 10 + date[i] - '0';
        i++;
    }
if (m1 > 12|| m1 < 0 || m2 > 12|| m2 < 0 || d1>31 ||d1<0||d2>31
||d2<0)
{
    printf("Invalid Date\n");
    exit(0);
}

    int no_of_leap_year = abs(leapyear(m1,y1)-leapyear(m2, y2));
    int no_of_days=abs((y1*365+d1+daysafterNmonths[m1-1])-
(y2*365+d2+daysafterNmonths[m2-1]))+no_of_leap_year;

    printf("Total number of days between (%s) is %d", date,
no_of_days);
    return 0;
}
```

OUTPUT:



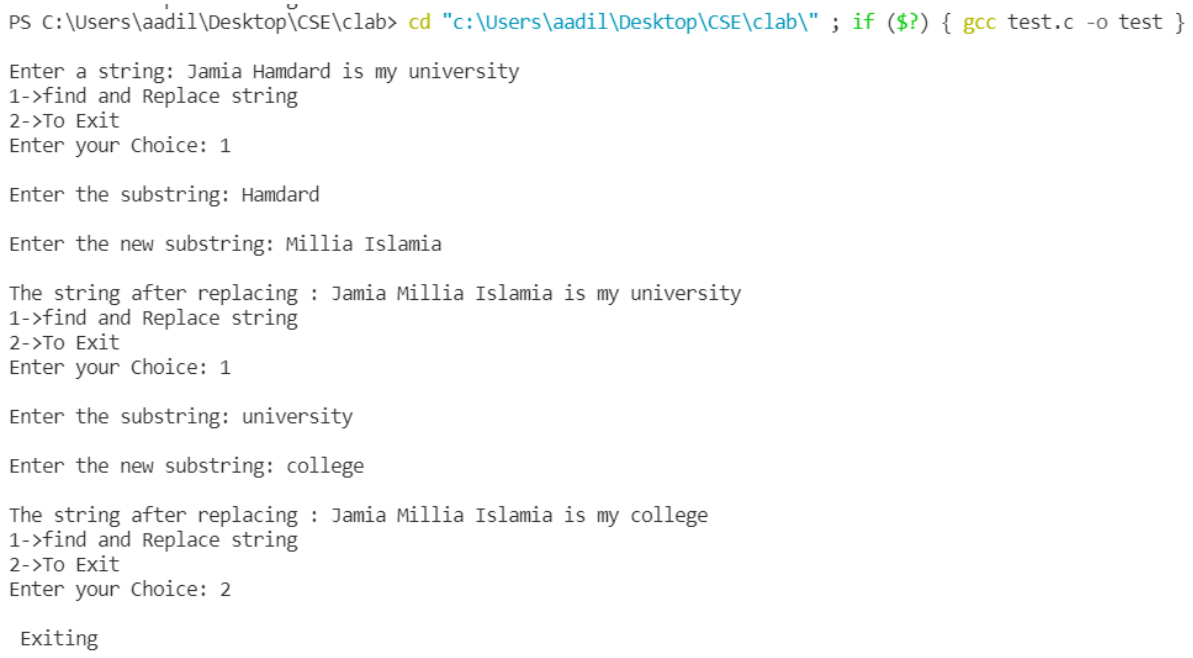
```
PS C:\Users\aadil\Desktop\CSE\clab> cd "c:\Users\aadil\Desktop\CSE\clab\" ; if ($?) { gcc program8.c -o program8 } ;
Enter the two Dates : 14-10-2021,12-01-1880
Total number of days between (14-10-2021,12-01-1880) is 51775
PS C:\Users\aadil\Desktop\CSE\clab> 
```

20BCS042 MOHD ADIL

PROGRAM 9:

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

int findsubstring(char string[], char substring[]);
void replaceSubstring(char[], char[], char[]);

int main()
{
    char string[100], sub[100], new_str[100];
    printf("\nEnter a string: ");
    gets(string);
    while (1)
    {
        int ch;
        printf("1->find and Replace string\n");
        printf("2->To Exit\n");
        printf("Enter your Choice: ");
        scanf("%d", &ch);
        getchar();
        switch (ch)
        {
        case 1:
            printf("\nEnter the substring: ");
            gets(sub);
            if (findsubstring(string, sub) != -1)
            {
                printf("\nEnter the new substring: ");
                gets(new_str);
                replaceSubstring(string, sub, new_str);
                printf("\nThe string after replacing : %s\n",
string);
            }
            else
                printf("String is not present\n");
            break;
        case 2:
            printf("\n Exiting\n\n");
            exit(0);
            break;
        default:
            printf("Wrong Input\n");
            break;
        }
    }

    return 0;
}

int findsubstring(char string[], char substring[])
{
    int m = strlen(string);
    int n = strlen(substring);
    for (int i = 0; i <= m - n; i++)
    {
        int j;
        for (j = 0; j < n; j++)
        {
            if (string[i + j] != substring[j])
            {
                break;
            }
        }
        if (j == n)
            return i;
    }
    return -1;
}
void replaceSubstring(char string[], char sub[], char new_str[])
{
    int stringLen, subLen, newLen;
    int i = 0, j, k;
    int flag = 0, start, end;
    stringLen = strlen(string);
    subLen = strlen(sub);
    newLen = strlen(new_str);

    for (i = 0; i < stringLen; i++)
    {
        flag = 0;
        start = i;
        for (j = 0; string[i] == sub[j]; j++, i++)
            if (j == subLen - 1)
                flag = 1;
        end = i;
        if (flag == 0)
            i -= j;
        else
        {
            for (j = start; j < end; j++)
            {
                for (k = start; k < stringLen; k++)
                    string[k] = string[k + 1];
                stringLen--;
                i--;
            }

            for (j = start; j < start + newLen; j++)
            {
                for (k = stringLen; k >= j; k--)
                    string[k + 1] = string[k];
                string[j] = new_str[j - start];
                stringLen++;
                i++;
            }
        }
    }
}
```

OUTPUT:



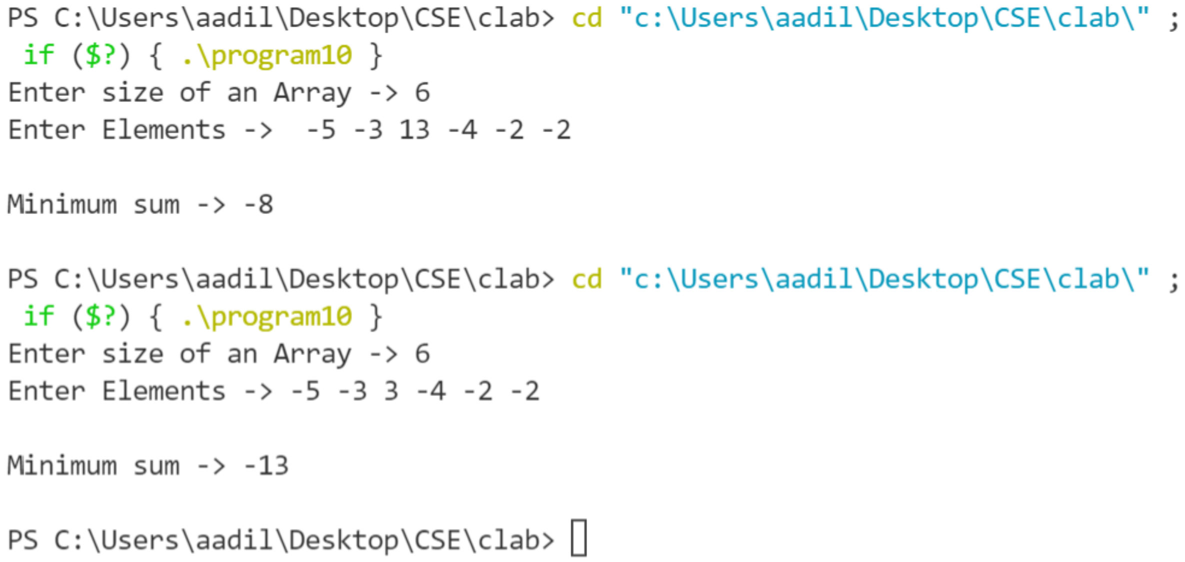
```
PS C:\Users\aadil\Desktop\CSE\clab> cd "c:\Users\aadil\Desktop\CSE\clab\" ; if ($?) { gcc test.c -o test }

Enter a string: Jamia Hamdard is my university
1->find and Replace string
2->To Exit
Enter your Choice: 1

Enter the substring: Hamdard

Enter the new substring: Millia Islamia

The string after replacing : Jamia Millia Islamia is my university
1->find and Replace string
2->To Exit
Enter your Choice: 1

Enter the substring: university

Enter the new substring: college

The string after replacing : Jamia Millia Islamia is my college
1->find and Replace string
2->To Exit
Enter your Choice: 2

 Exiting
```

20BCS042 MOHD ADIL

PROGRAM 10:

```c
#include <stdio.h>
#define max __INT_MAX__

int main()
{
    int n;
    printf("Enter size of an Array -> ");
    scanf("%d", &n);
    printf("Enter Elements -> ");
    int arr[n];
    for (int i = 0; i < n; i++)
    {
        scanf("%d", &arr[i]);
    }
    int sum = max;//initialising sum with max value of int
    int temp;
    for (int i = 1; i <= n; i++)//grouping no. of elements
    {
        for (int j = 0; j <= n - i; j++)//iterating through these continous groups
        {
            temp = 0;
            for (int k = j; k < j + i; k++)//iterating through elements of particular group
            {
                temp += arr[k];
            }
            if (temp <= sum)
            {
                sum = temp;//using minimum sum
            }
        }
    }
    printf("\nMinimum sum -> %d\n\n", sum);
    return 0;
}
```

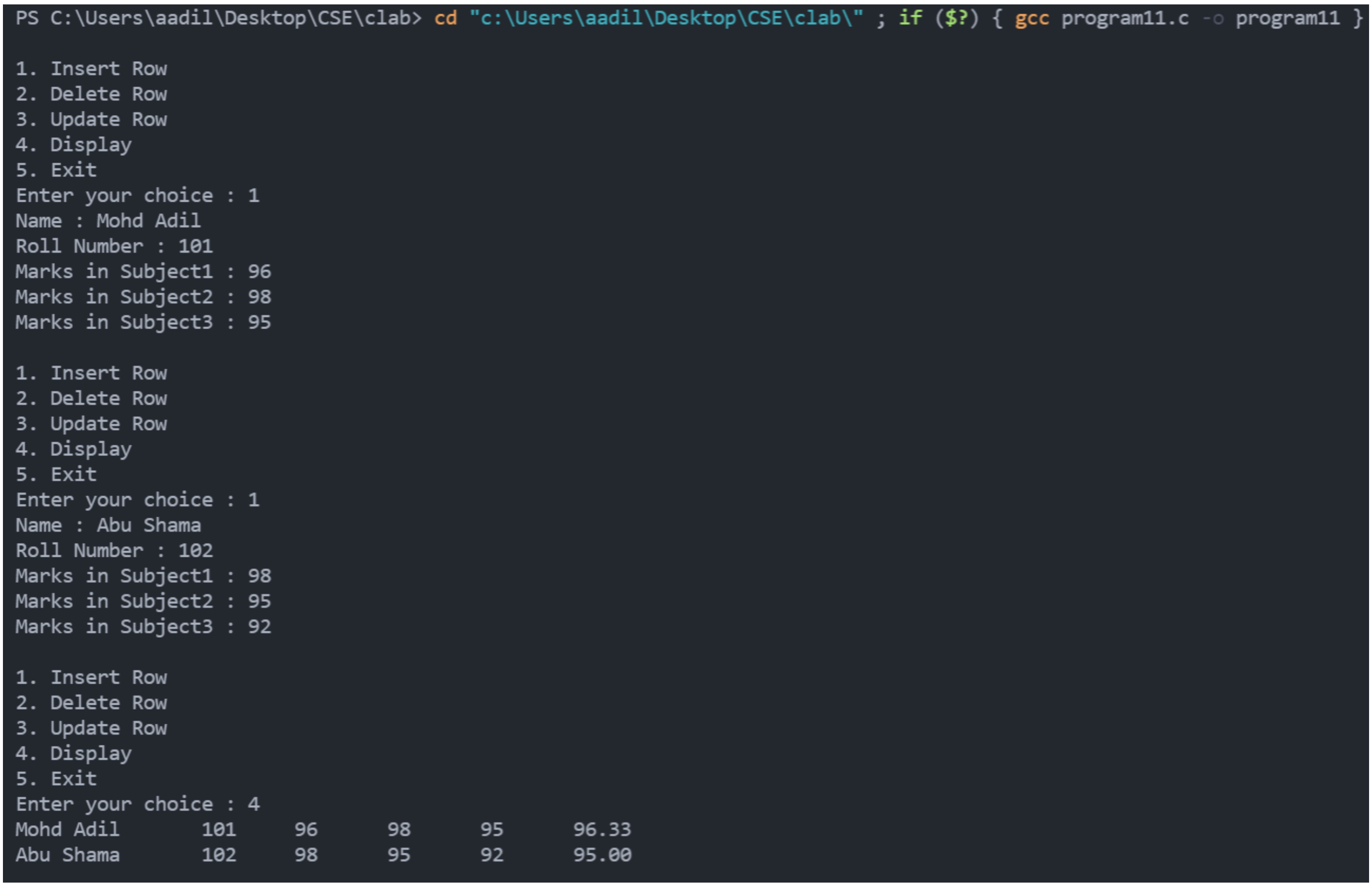
OUTPUT:



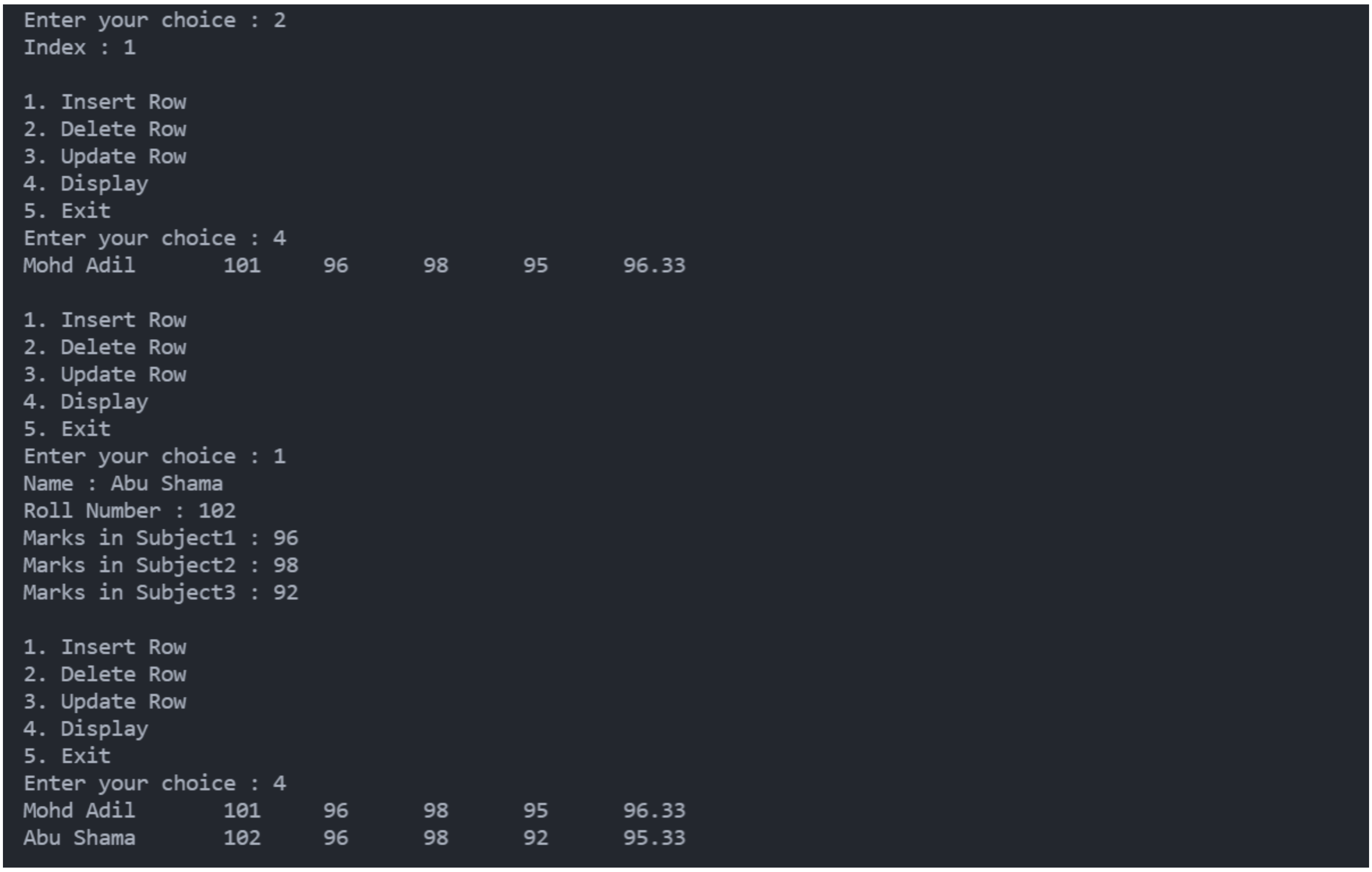
```
PS C:\Users\aadil\Desktop\CSE\clab> cd "c:\Users\aadil\Desktop\CSE\clab\" ;
 if ($?) { .\program10 }
Enter size of an Array -> 6
Enter Elements ->  -5 -3 13 -4 -2 -2

Minimum sum -> -8

PS C:\Users\aadil\Desktop\CSE\clab> cd "c:\Users\aadil\Desktop\CSE\clab\" ;
 if ($?) { .\program10 }
Enter size of an Array -> 6
Enter Elements -> -5 -3 3 -4 -2 -2

Minimum sum -> -13

PS C:\Users\aadil\Desktop\CSE\clab>
```

```
#include <stdio.h>
#include <stdlib.h>
struct Student
{
    char name[20];
    int roll_number;
    int subject1;
    int subject2;
    int subject3;
    float percentage;
} st[1000];
int count = 0;

void insert()
{
    struct Student s;
    printf("Name : ");
    scanf(" %[^\n]", s.name);
    printf("Roll Number : ");
    scanf("%d", &s.roll_number);
    printf("Marks in Subject1 : ");
    scanf("%d", &s.subject1);
    printf("Marks in Subject2 : ");
    scanf("%d", &s.subject2);
    printf("Marks in Subject3 : ");
    scanf("%d", &s.subject3);
    s.percentage = (float)(s.subject1 + s.subject2 + s.subject3) / 3;
    st[count++] = s;
}
void delete ()
{
    printf("Index : ");
    int index;
    scanf("%d", &index);
    for (int i = index; i < count; i++)
    {
        st[i] = st[i + 1];
    }
    count--;
}
void update()
{
    printf("Index : ");
    int index;
    scanf("%d", &index);
    printf("Name : ");
    scanf(" %[^\n]", st[index].name);
    printf("Roll Number : ");
    scanf("%d", &st[index].roll_number);
    printf("Marks in Subject1 : ");
    scanf("%d", &st[index].subject1);
    printf("Marks in Subject2 : ");
    scanf("%d", &st[index].subject2);
    printf("Marks in Subject3 : ");
    scanf("%d", &st[index].subject3);
}
void display()
{
    for (int i = 0; i < count; i++)
    {
        printf("%s\t%d\t%d\t%d\t%d\t%.2f\n", st[i].name, st[i].roll_number,
st[i].subject1, st[i].subject2, st[i].subject3, st[i].percentage);
    }
}
int main()
{
    FILE *ptr;
    ptr = fopen("data.txt", "r");
    if (ptr == NULL)
    {
        printf("\nError opening file");
    }
    else
    {
        while (fscanf(ptr, "%[^\t]\t%d\t%d\t%d\t%d\t%f\n", st[count].name,
&st[count].roll_number, &st[count].subject1, &st[count].subject2,
&st[count].subject3, &st[count].percentage) != EOF)
        {
            count++;
        }
    }
    int ch;
    while (1)
    {
        printf("\n1. Insert Row\n2. Delete Row\n3. Update Row\n4.
Display\n5. Exit\n");
        printf("Enter your choice : ");
        scanf("%d", &ch);
        getchar();
        switch (ch)
        {
        case 1:
            insert();
            break;
        case 2:
            delete ();
            break;
        case 3:
            update();
            break;
        case 4:
            display();
            break;
        case 5:
        {
            printf("\n**Exiting**\n");
            int i = 0;
            ptr = fopen("data.txt", "w");
            while ( i<count)
            {
                fprintf(ptr, "%s\t%d\t%d\t%d\t%d\t%.2f\n", st[i].name,
st[i].roll_number, st[i].subject1, st[i].subject2, st[i].subject3,
st[i].percentage);
                i++;
            }
            fclose(ptr);
            exit(0);
        }
        default:
            printf("Wrong Input.\n");
            break;
        }
    }

    return 0;
}
```

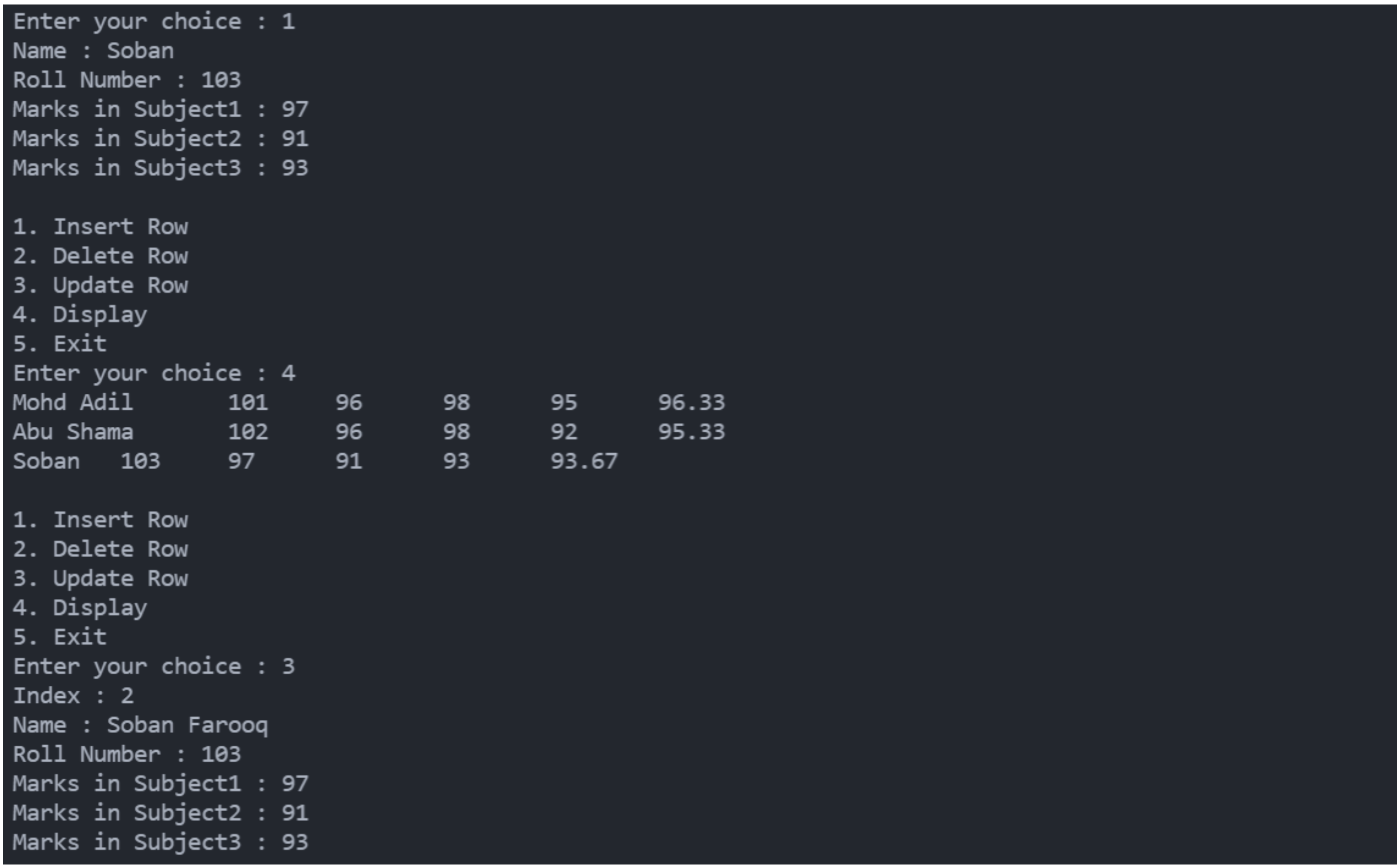
OUTPUT



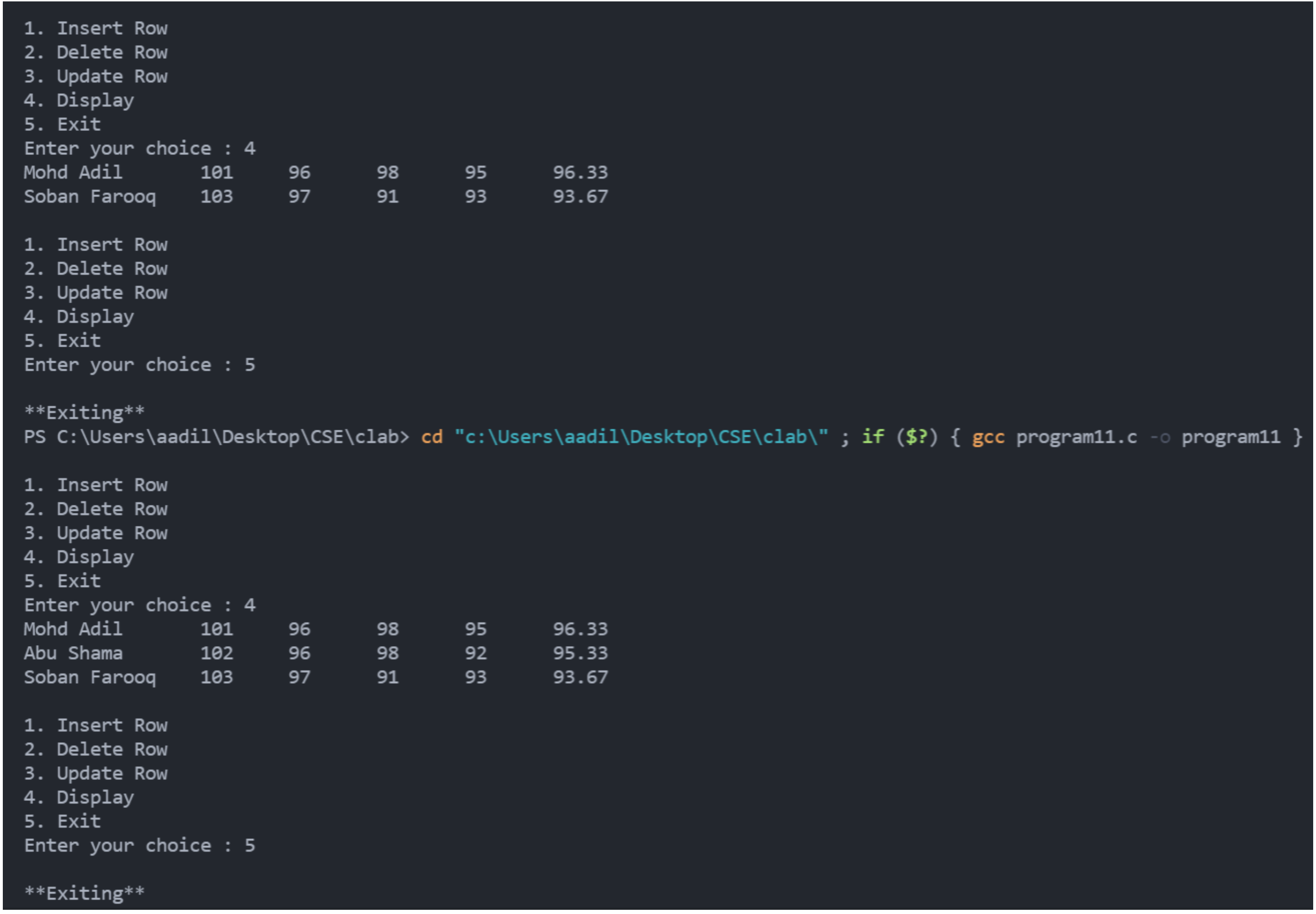
```
PS C:\Users\aadil\Desktop\CSE\clab> cd "c:\Users\aadil\Desktop\CSE\clab\" ; if ($?) { gcc program11.c -o program11 }

1. Insert Row
2. Delete Row
3. Update Row
4. Display
5. Exit
Enter your choice : 1
Name : Mohd Adil
Roll Number : 101
Marks in Subject1 : 96
Marks in Subject2 : 98
Marks in Subject3 : 95

1. Insert Row
2. Delete Row
3. Update Row
4. Display
5. Exit
Enter your choice : 1
Name : Abu Shama
Roll Number : 102
Marks in Subject1 : 98
Marks in Subject2 : 95
Marks in Subject3 : 92

1. Insert Row
2. Delete Row
3. Update Row
4. Display
5. Exit
Enter your choice : 4
Mohd Adil       101     96      98      95      96.33
Abu Shama       102     98      95      92      95.00
```



```
Enter your choice : 2
Index : 1

1. Insert Row
2. Delete Row
3. Update Row
4. Display
5. Exit
Enter your choice : 4
Mohd Adil       101     96      98      95      96.33

1. Insert Row
2. Delete Row
3. Update Row
4. Display
5. Exit
Enter your choice : 1
Name : Abu Shama
Roll Number : 102
Marks in Subject1 : 96
Marks in Subject2 : 98
Marks in Subject3 : 92

1. Insert Row
2. Delete Row
3. Update Row
4. Display
5. Exit
Enter your choice : 4
Mohd Adil       101     96      98      95      96.33
Abu Shama       102     96      98      92      95.33
```

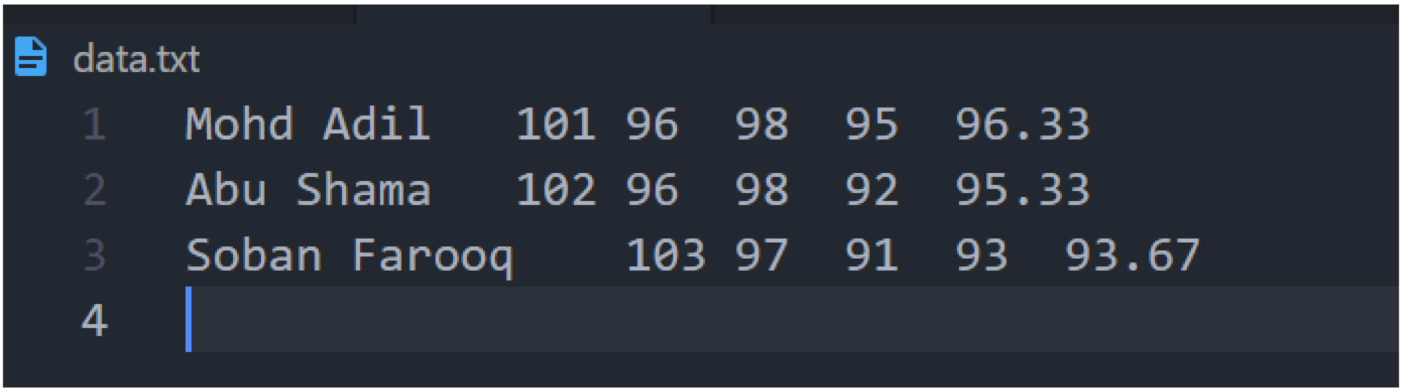


```
Enter your choice : 1
Name : Soban
Roll Number : 103
Marks in Subject1 : 97
Marks in Subject2 : 91
Marks in Subject3 : 93

1. Insert Row
2. Delete Row
3. Update Row
4. Display
5. Exit
Enter your choice : 4
Mohd Adil       101     96      98      95      96.33
Abu Shama       102     96      98      92      95.33
Soban   103     97      91      93      93.67

1. Insert Row
2. Delete Row
3. Update Row
4. Display
5. Exit
Enter your choice : 3
Index : 2
Name : Soban Farooq
Roll Number : 103
Marks in Subject1 : 97
Marks in Subject2 : 91
Marks in Subject3 : 93
```



```
1. Insert Row
2. Delete Row
3. Update Row
4. Display
5. Exit
Enter your choice : 4
Mohd Adil       101     96      98      95      96.33
Soban Farooq    103     97      91      93      93.67

1. Insert Row
2. Delete Row
3. Update Row
4. Display
5. Exit
Enter your choice : 5

**Exiting**
PS C:\Users\aadil\Desktop\CSE\clab> cd "c:\Users\aadil\Desktop\CSE\clab\" ; if ($?) { gcc program11.c -o program11 }

1. Insert Row
2. Delete Row
3. Update Row
4. Display
5. Exit
Enter your choice : 4
Mohd Adil       101     96      98      95      96.33
Abu Shama       102     96      98      92      95.33
Soban Farooq    103     97      91      93      93.67

1. Insert Row
2. Delete Row
3. Update Row
4. Display
5. Exit
Enter your choice : 5

**Exiting**
```

And the file ...



```
Mohd Adil   101 96  98  95  96.33
Abu Shama   102 96  98  92  95.33
Soban Farooq    103 97  91  93  93.67

```

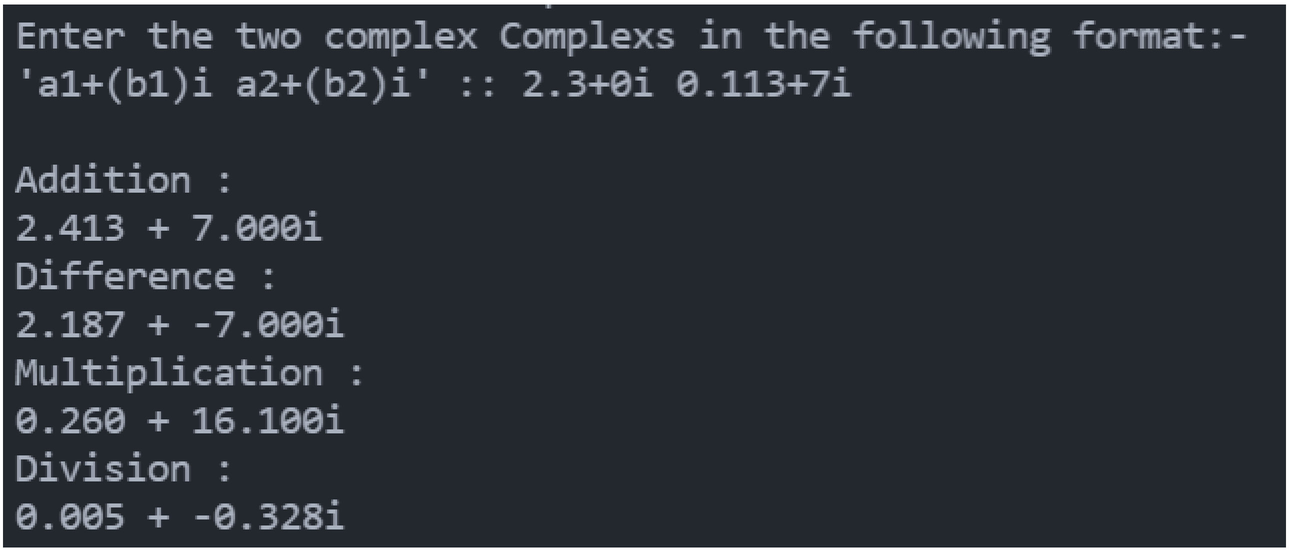
```
#include <stdio.h>
#include<math.h>
#include<string.h>
struct Complex
{
    float a;
    float b;
};

void add(struct Complex c1, struct Complex c2){
    printf("\nAddition : \n");
    printf("%0.3f + %0.3fi", c1.a+c2.a, c1.b+c2.b);
}

void subtract(struct Complex c1, struct Complex c2){
    printf("\nDifference : \n");
    printf("%0.3f + %0.3fi", c1.a-c2.a, c1.b-c2.b);
}

struct Complex multiply2(struct Complex c1, struct Complex c2){
    float x = (c1.a)*(c2.a) - (c1.b)*(c2.b);
    float y = (c1.a)*(c2.b) + (c1.b)*(c2.a);

    struct Complex ans;
    ans.a = x;
    ans.b = y;
    return ans;
}

void multiply(struct Complex c1, struct Complex c2){
    struct Complex ans = multiply2(c1, c2);
    printf("\nMultiplication : \n");
    printf("%0.3f + %0.3fi", ans.a, ans.b);
}

void divide(struct Complex c1, struct Complex c2){
    float deno = (c2.a)*(c2.a) + (c2.b)*(c2.b);

    c2.b = (-1)*c2.b;

    struct Complex ans = multiply2(c1, c2);
    ans.a = ans.a/deno;
    ans.b = ans.b/deno;

    printf("\nDivision : \n");
    printf("%0.3f + %0.3fi", ans.a, ans.b);
}
int main()
{
    char input[50];
    int l, i = 0, neg_a1 = 0, neg_b1 = 0, neg_a2 = 0, neg_b2 = 0;
    float a1 = 0, b1 = 0, a2 = 0, b2 = 0, a1_f = 0, b1_f = 0, a2_f =
0, b2_f = 0;
    fflush(stdin);
    printf("\nEnter the two complex Complexs in the following format:-
\n");
    printf("'a1+(b1)i a2+(b2)i' :: ");
    gets(input);
    l = strlen(input);

    if (input[i] == '-')
    {
        i++;
        neg_a1 = 1;
    }
    while (input[i] != '+' && input[i] != '-' && input[i] != '.')
    {
        a1 = a1 * 10 + (input[i] - '0');
        i++;
    }
    if (input[i] == '.')
    {
        i++;
        int n = 1;
        while (input[i] != '+' && input[i] != '-')
        {
            a1_f = a1_f + (input[i] - '0') * pow(0.1, n);
            n++;
            i++;
        }
    }
    a1 = a1 + a1_f;
    if (neg_a1)
```

```
{
    a1 = a1 * (-1);
}

if (input[i] == '-')
{
    i++;
    neg_b1 = 1;
}
else
    i++;

while (input[i] != 'i' && input[i] != '.')
{
    b1 = b1 * 10 + (input[i] - '0');
    i++;
}
if (input[i] == '.')
{
    i++;
    int n = 1;
    while (input[i] != 'i')
    {
        b1_f = b1_f + (input[i] - '0') * pow(0.1, n);
        n++;
        i++;
    }
}
b1 = b1 + b1_f;
if (neg_b1)
{
    b1 = b1 * (-1);
}

i += 2;

if (input[i] == '-')
{
    i++;
    neg_a2 = 1;
}
while (input[i] != '+' && input[i] != '-' && input[i] != '.')
```

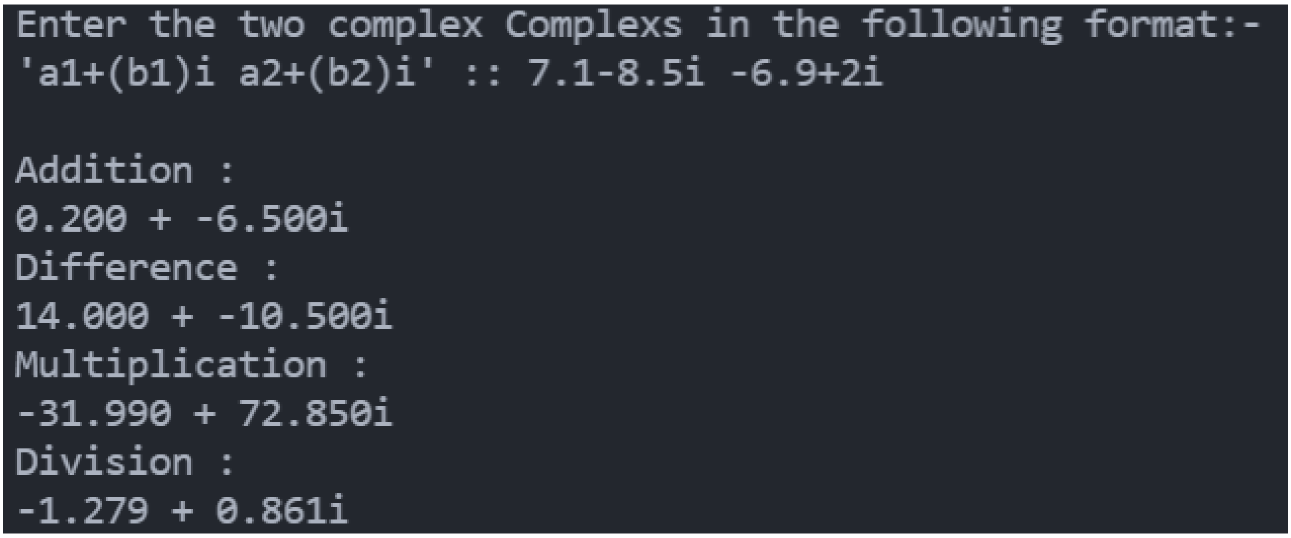
```
{
    a2 = a2 * 10 + (input[i] - '0');
    i++;
}
if (input[i] == '.')
{
    i++;
    int n = 1;
    while (input[i] != '+' && input[i] != '-')
    {
        a2_f = a2_f + (input[i] - '0') * pow(0.1, n);
        n++;
        i++;
    }
}
a2 = a2 + a2_f;
if (neg_a2)
{
    a2 = a2 * (-1);
}

if (input[i] == '-')
{
    i++;
    neg_b2 = 1;
}
else
    i++;

while (input[i] != 'i' && input[i] != '.')
{
    b2 = b2 * 10 + (input[i] - '0');
    i++;
}
if (input[i] == '.')
{
    i++;
    int n = 1;
    while (input[i] != 'i')
    {
        b2_f = b2_f + (input[i] - '0') * pow(0.1, n);
        n++;
```

```
            i++;
        }
    }
    b2 = b2 + b2_f;
    if (neg_b2)
    {
        b2 = b2 * (-1);
    }
    struct Complex C1={a1,b1};
    struct Complex C2={a2,b2};
    add(C1, C2);
    subtract(C1,C2);
    multiply(C1,C2);
    divide(C1,C2);
    return 0;
}
```

OUTPUT



```
Enter the two complex Complexs in the following format:-
'a1+(b1)i a2+(b2)i' :: 2.3+0i 0.113+7i

Addition :
2.413 + 7.000i
Difference :
2.187 + -7.000i
Multiplication :
0.260 + 16.100i
Division :
0.005 + -0.328i
```



```
Enter the two complex Complexs in the following format:-
'a1+(b1)i a2+(b2)i' :: 7.1-8.5i -6.9+2i

Addition :
0.200 + -6.500i
Difference :
14.000 + -10.500i
Multiplication :
-31.990 + 72.850i
Division :
-1.279 + 0.861i
```