Lab 5
ITP 203

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Group ‘A’

Question 1

WAP to do following:

a)Insert a number at a given position in an array of numbers.
b)Delete from a given position in an array of numbers.
c)Find the sum of even and odd elements of array separately
d)Concatenate two arrays.
Use different functions.

Answer:

//Inserts a number at a given position in an array of numbers.

```
#include <stdio.h>

int insert()
{
   int array[100], position, i, n, value;

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

   printf("Enter %d elements: \n", n);

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

   printf("Enter the location where you want to insert an
element: \n");
   scanf("%d", &position);

   printf("Enter the value to insert:\n");
   scanf("%d", &value);

   for (i = n - 1; i >= position - 1; i--)
      array[i] = array[i+1];

   array[position-1] = value;
```

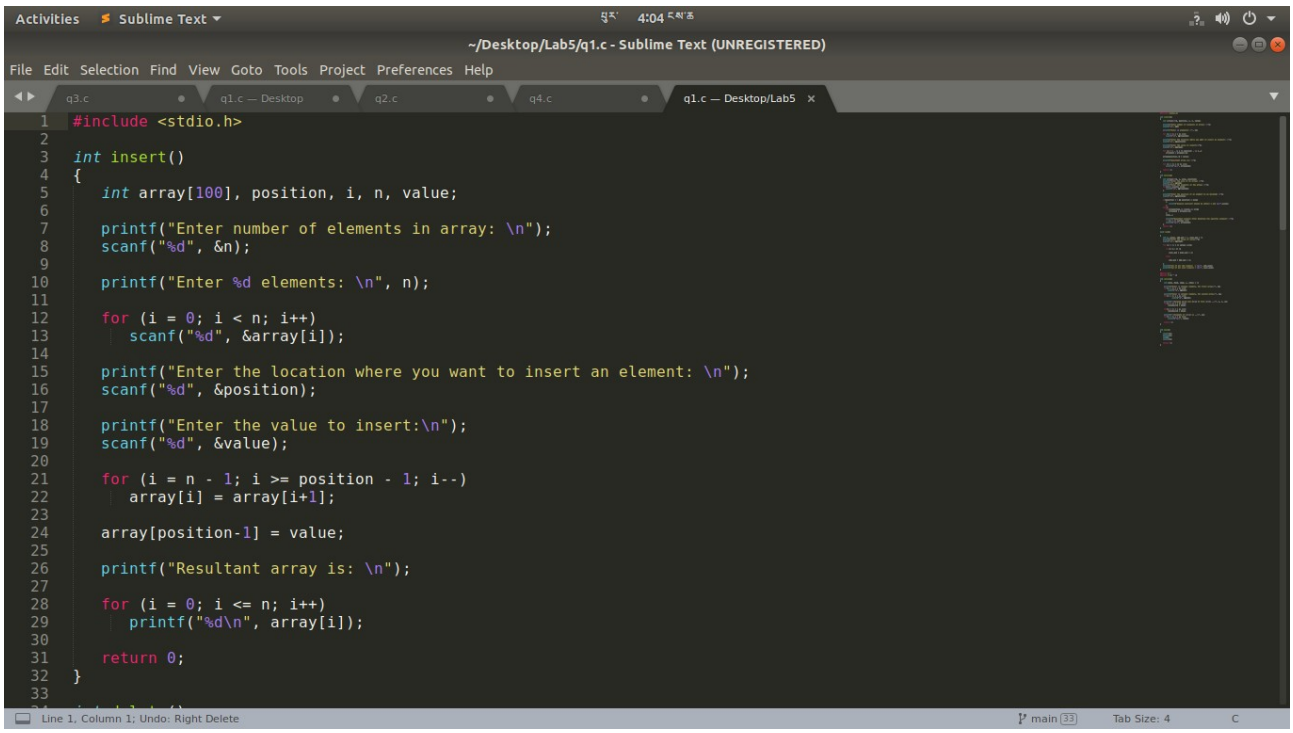
```
   printf("Resultant array is: \n");

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

   return 0;
}


//Deletes from a given position in an array of numbers.

int delete()
{
   int array[100], i, size, position;
   printf("Enter the size of an array: \n");
   scanf("%d", &size);
   printf("Enter the elements in the array: \n");
   for(i=0; i<size; i++){
      scanf("%d", &array[i]);
   }

   printf("Enter the position of an element to be deleted: \n");
   scanf("%d", &position);

   if(position < 0 || position > size)
      {
         printf("Invalid postion! should be within 1 and %d\
n",size);
      }
   else{
      for(i=position-1; i<size-1; i++){
         array[i] = array[i+1];
      }
      size--;

      printf("Resultant element after deleting the specific
element: \n");
      for(i = 0; i<size; i++)
      printf("%d\n", array[i]);
   }
   return 0;
```

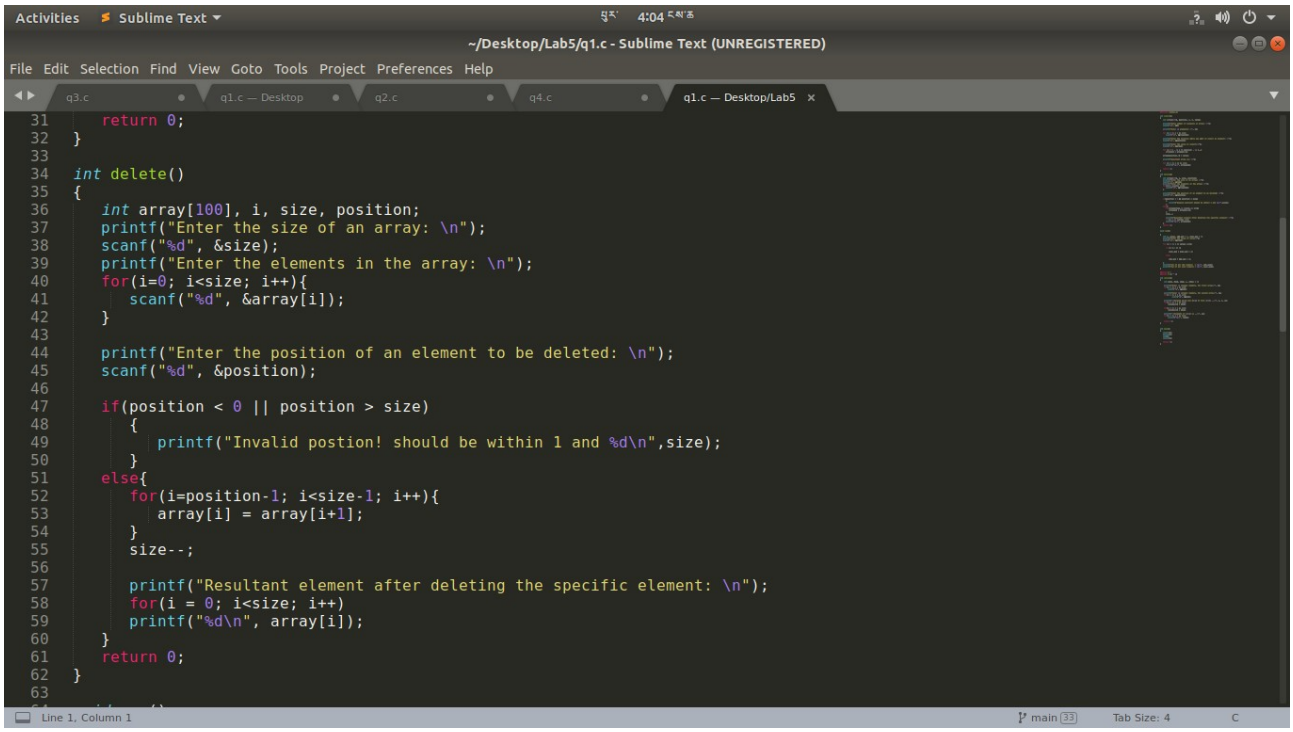
```
}

//Find the sum of even and odd elements of array separately

void sum()

{
   int i, value, odd_sum = 0, even_sum = 0;
   printf("Enter the value of value\n");
   scanf("%d", &value);

   for (i = 1; i <= value; i++){

      if (i % 2 == 0)

         even_sum = even_sum + i;

      else

         odd_sum = odd_sum + i;

   }
   printf("Sum of all odd numbers  = %d\n", odd_sum);
   printf("Sum of all even numbers = %d\n", even_sum);
}
```

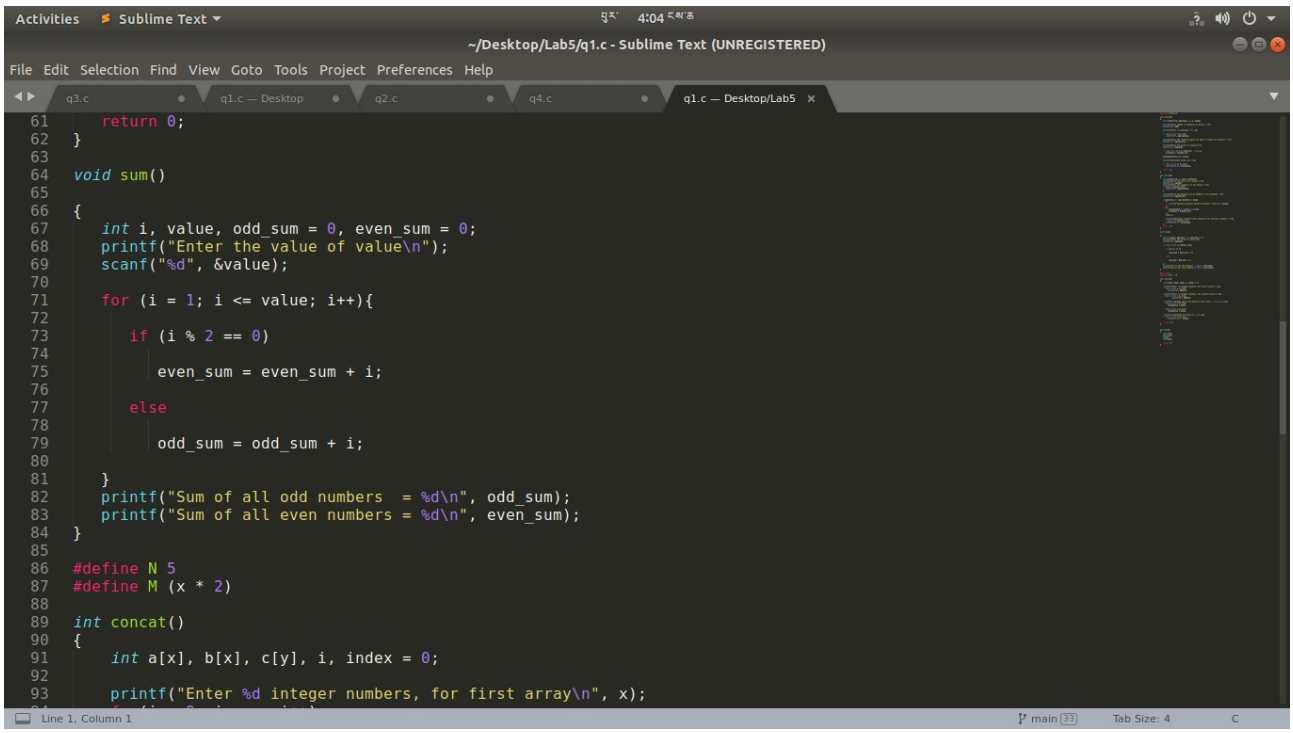
d)Concatenate two arrays.

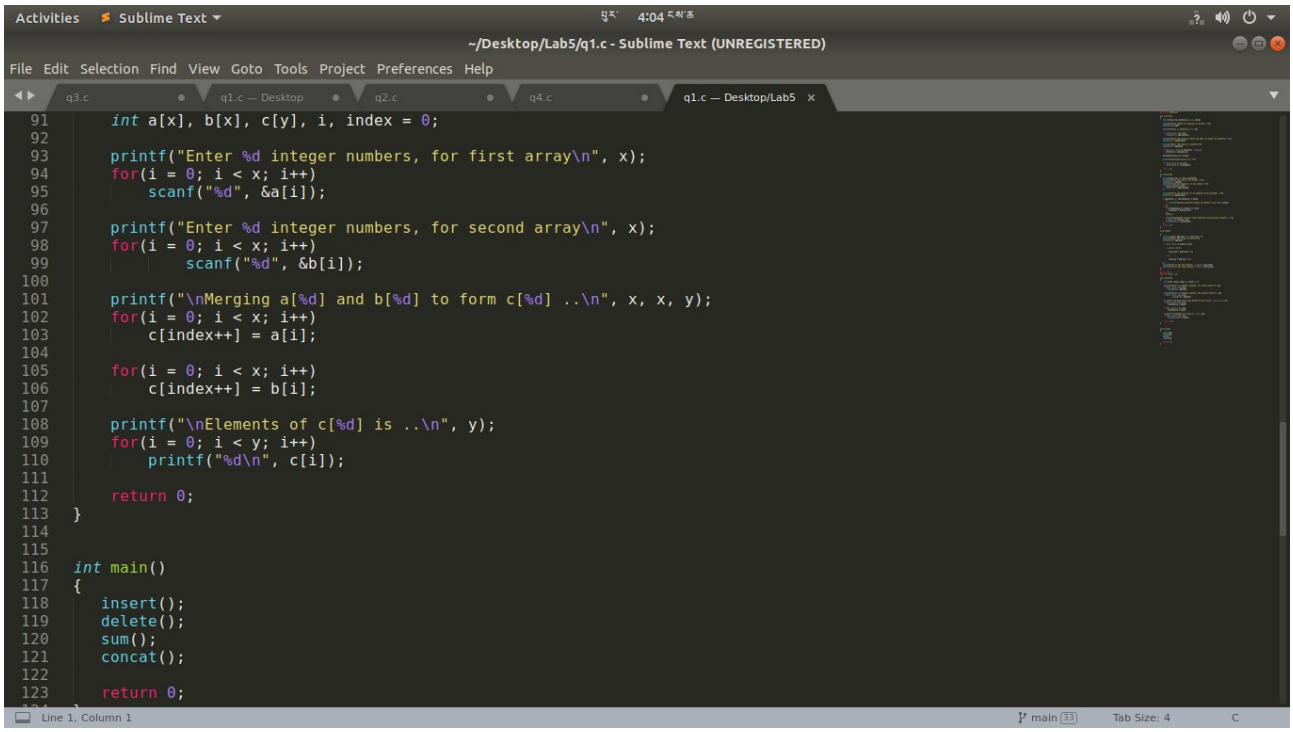
```
#define N 5
#define M (x * 2)

int concat()
{
    int a[x], b[x], c[y], i, index = 0;

    printf("Enter %d integer numbers, for first array\n", x);
    for(i = 0; i < x; i++)
        scanf("%d", &a[i]);

    printf("Enter %d integer numbers, for second array\n", x);
    for(i = 0; i < x; i++)
```

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

    printf("\nMerging a[%d] and b[%d] to form c[%d] ..\n", x, x,
y);
    for(i = 0; i < x; i++)
        c[index++] = a[i];

    for(i = 0; i < x; i++)
        c[index++] = b[i];

    printf("\nElements of c[%d] is ..\n", y);
    for(i = 0; i < y; i++)
        printf("%d\n", c[i]);

    return 0;
}


int main()
{
   insert();
   delete();
   sum();
   concat();

   return 0;
}
```

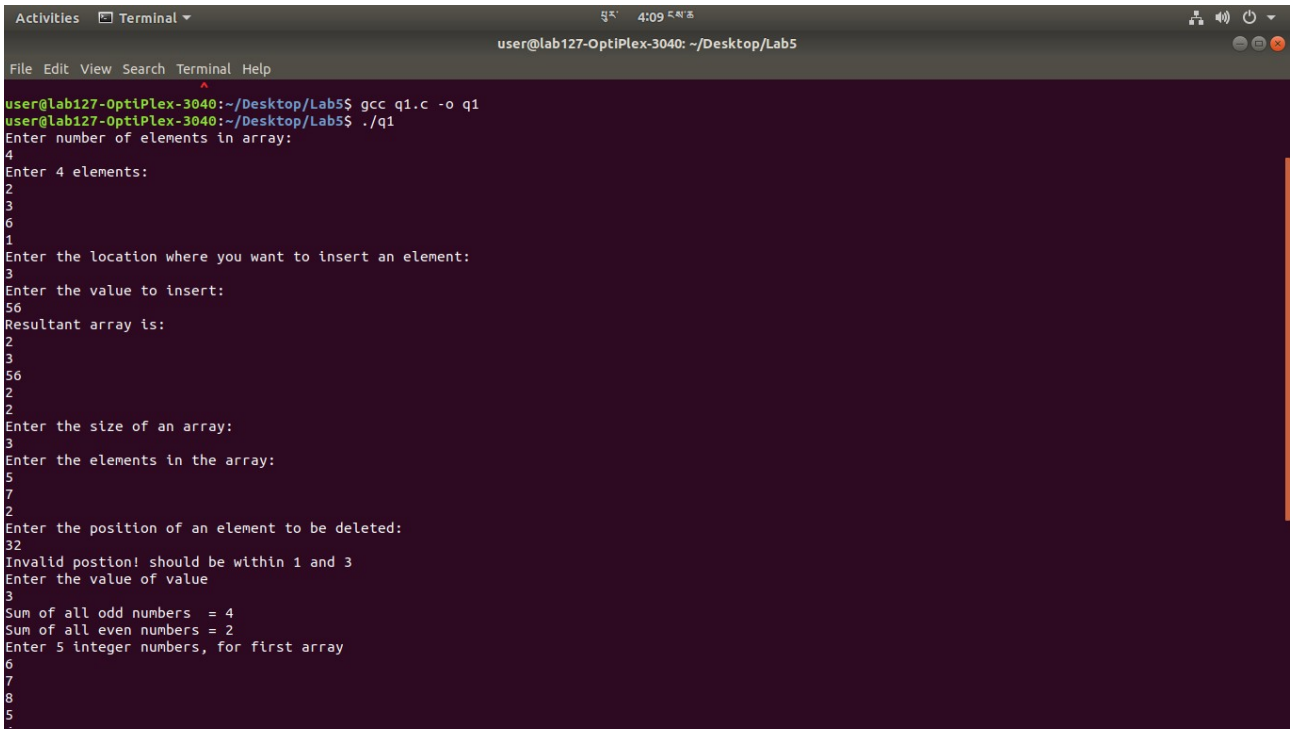

Activities
Sublime Text
4:04
~/Desktop/Lab5/q1.c - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
q3.c
q1.c — Desktop
q2.c
q4.c
q1.c — Desktop/Lab5
#include <stdio.h>
int insert()
{
int array[100], position, i, n, value;
printf("Enter number of elements in array: \n");
scanf("%d", &n);
printf("Enter %d elements: \n", n);
for (i = 0; i < n; i++)
scanf("%d", &array[i]);
printf("Enter the location where you want to insert an element: \n");
scanf("%d", &position);
printf("Enter the value to insert:\n");
scanf("%d", &value);
for (i = n - 1; i >= position - 1; i--)
array[i] = array[i+1];
array[position-1] = value;
printf("Resultant array is: \n");
for (i = 0; i <= n; i++)
printf("%d\n", array[i]);
return 0;
}
Line 1, Column 1; Undo: Right Delete
main 33
Tab Size: 4
C

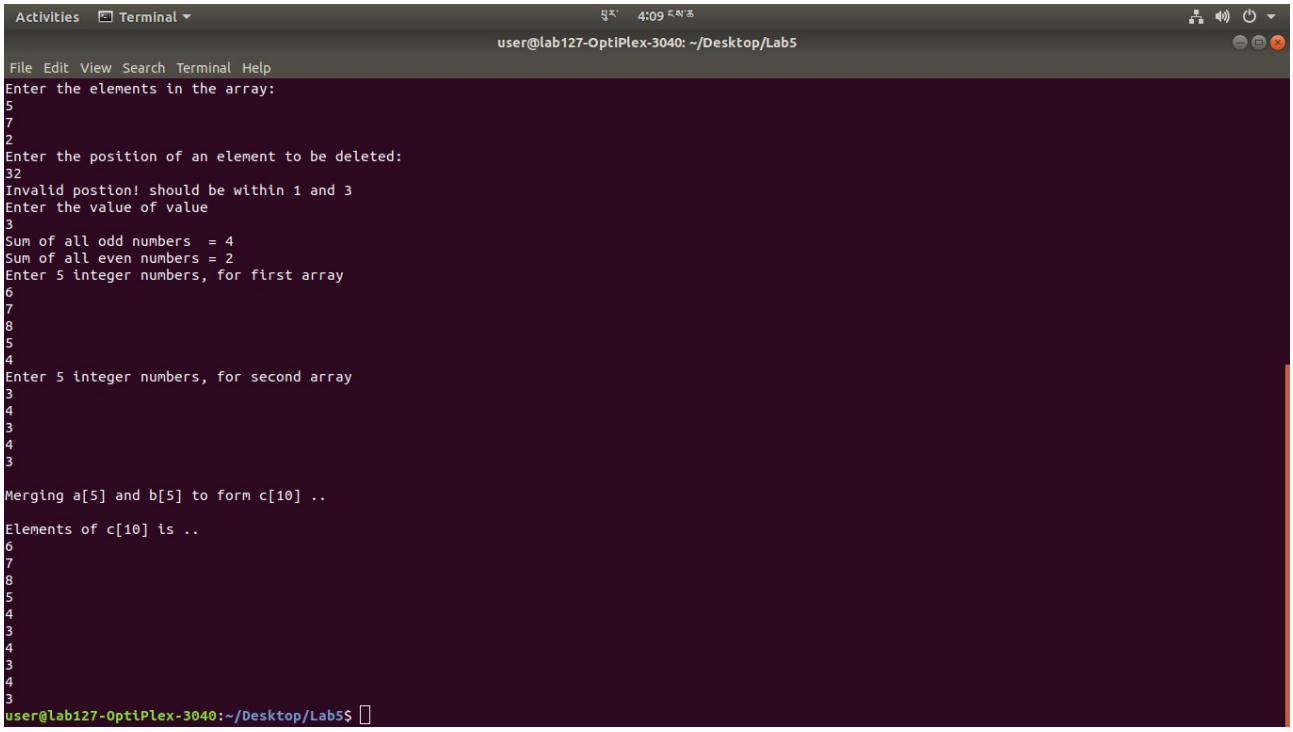

Activities
Sublime Text
4:04
~/Desktop/Lab5/q1.c - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
q3.c
q1.c — Desktop
q2.c
q4.c
q1.c — Desktop/Lab5
return 0;
}
int delete()
{
int array[100], i, size, position;
printf("Enter the size of an array: \n");
scanf("%d", &size);
printf("Enter the elements in the array: \n");
for(i=0; i<size; i++){
scanf("%d", &array[i]);
}
printf("Enter the position of an element to be deleted: \n");
scanf("%d", &position);
if(position < 0 || position > size)
{
printf("Invalid postion! should be within 1 and %d\n",size);
}
else{
for(i=position-1; i<size-1; i++){
array[i] = array[i+1];
}
size--;
printf("Resultant element after deleting the specific element: \n");
for(i = 0; i<size; i++)
printf("%d\n", array[i]);
}
return 0;
}
Line 1, Column 1
main 33
Tab Size: 4
C


Activities
Sublime Text
4:04
~/Desktop/Lab5/q1.c - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
q3.c
q1.c — Desktop
q2.c
q4.c
q1.c — Desktop/Lab5
return 0;
}
void sum()
{
int i, value, odd_sum = 0, even_sum = 0;
printf("Enter the value of value\n");
scanf("%d", &value);
for (i = 1; i <= value; i++){
if (i % 2 == 0)
even_sum = even_sum + i;
else
odd_sum = odd_sum + i;
}
printf("Sum of all odd numbers = %d\n", odd_sum);
printf("Sum of all even numbers = %d\n", even_sum);
}
#define N 5
#define M (x * 2)
int concat()
{
int a[x], b[x], c[y], i, index = 0;
printf("Enter %d integer numbers, for first array\n", x);
Line 1, Column 1
main 33
Tab Size: 4
C


Activities
Sublime Text
4:04
~/Desktop/Lab5/q1.c - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
q3.c
q1.c — Desktop
q2.c
q4.c
q1.c — Desktop/Lab5
int a[x], b[x], c[y], i, index = 0;
printf("Enter %d integer numbers, for first array\n", x);
for(i = 0; i < x; i++)
scanf("%d", &a[i]);
printf("Enter %d integer numbers, for second array\n", x);
for(i = 0; i < x; i++)
scanf("%d", &b[i]);
printf("\nMerging a[%d] and b[%d] to form c[%d] ..\n", x, x, y);
for(i = 0; i < x; i++)
c[index++] = a[i];
for(i = 0; i < x; i++)
c[index++] = b[i];
printf("\nElements of c[%d] is ..\n", y);
for(i = 0; i < y; i++)
printf("%d\n", c[i]);
return 0;
}
int main()
{
insert();
delete();
sum();
concat();
return 0;
Line 1, Column 1
main 33
Tab Size: 4
C

Output:


Activities
Terminal
4:09
user@lab127-OptiPlex-3040: ~/Desktop/Lab5
File Edit View Search Terminal Help
user@lab127-OptiPlex-3040:~/Desktop/Lab5$ gcc q1.c -o q1
user@lab127-OptiPlex-3040:~/Desktop/Lab5$ ./q1
Enter number of elements in array:
4
Enter 4 elements:
2
3
6
1
Enter the location where you want to insert an element:
3
Enter the value to insert:
56
Resultant array is:
2
3
56
2
2
Enter the size of an array:
3
Enter the elements in the array:
5
7
2
Enter the position of an element to be deleted:
32
Invalid postion! should be within 1 and 3
Enter the value of value
3
Sum of all odd numbers = 4
Sum of all even numbers = 2
Enter 5 integer numbers, for first array
6
7
8
5


Activities
Terminal
4:09
user@lab127-OptiPlex-3040: ~/Desktop/Lab5
File Edit View Search Terminal Help
Enter the elements in the array:
5
7
2
Enter the position of an element to be deleted:
32
Invalid postion! should be within 1 and 3
Enter the value of value
3
Sum of all odd numbers = 4
Sum of all even numbers = 2
Enter 5 integer numbers, for first array
6
7
8
5
4
Enter 5 integer numbers, for second array
3
4
3
4
3
Merging a[5] and b[5] to form c[10] ..
Elements of c[10] is ..
6
7
8
5
4
3
4
3
4
3
user@lab127-OptiPlex-3040:~/Desktop/Lab5$

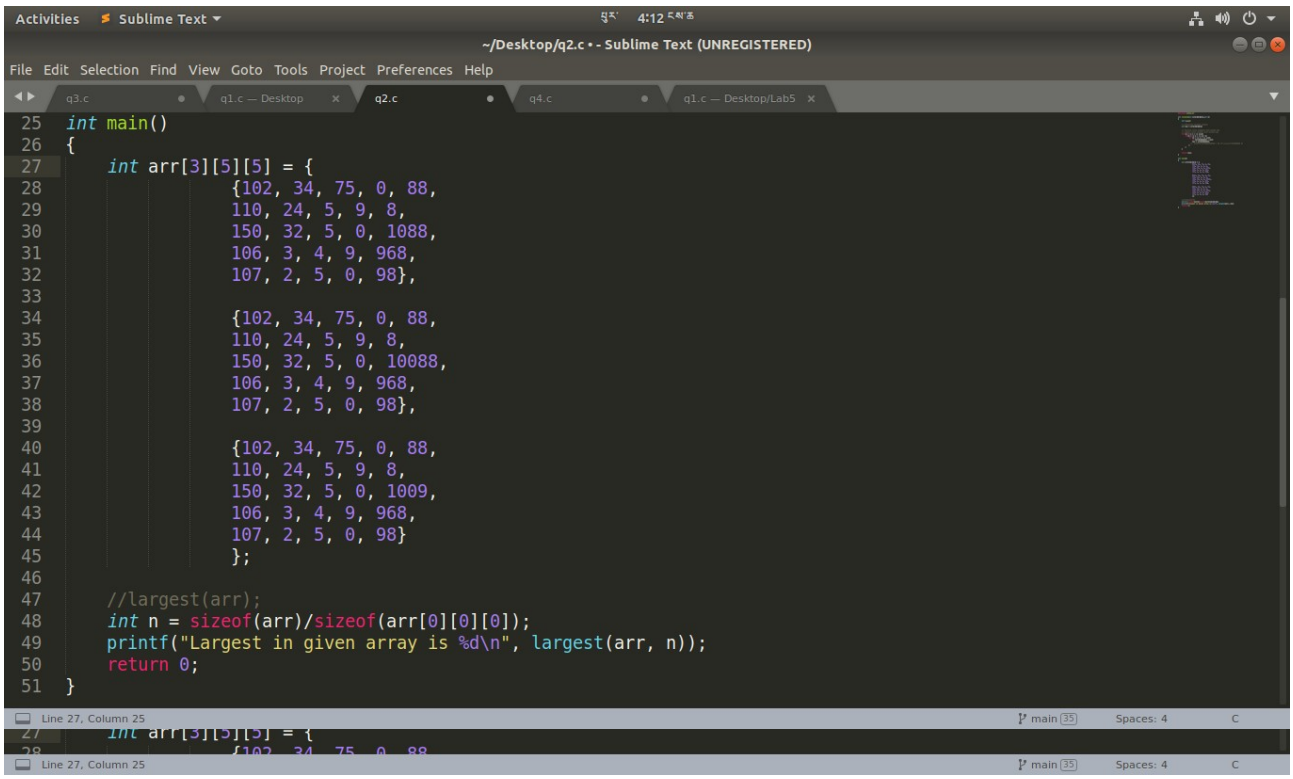
Question2

WAP to find the largest number from a Matrix A of the dimension 3 x 5 x 5.

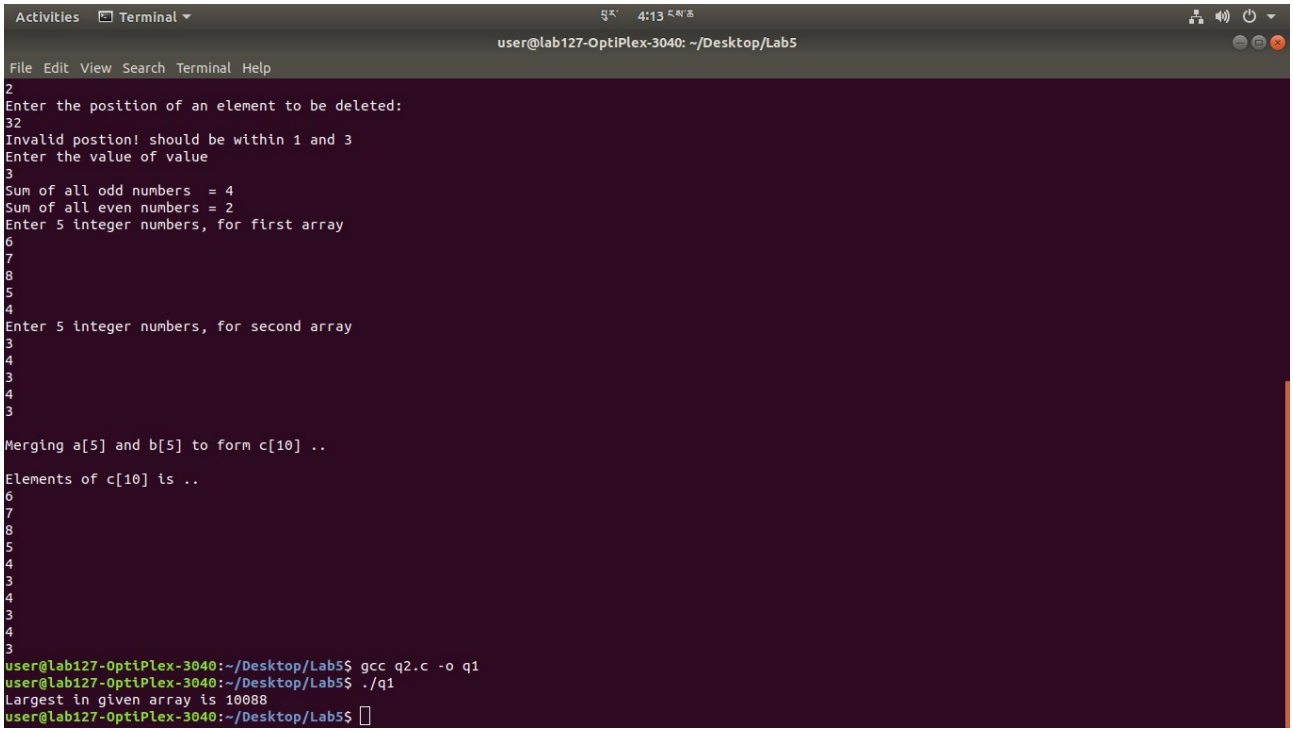
Answer:

```
#include <stdio.h>

int largest(int arr[3][5][5],int n)
{
    int i,j,k;

    // Initialize maximum element
    int max = arr[0][0][0];

    // Traverse array elements from second and
    // compare every element with current max
    for (i = 0; i < 3; i++){
        for(j = 0; j < 5; j++ ){
            for (k = 0; k < 5; ++k){
                if (arr[i][j][k] > max)
                max = arr[i][j][k];
              //  printf("arr[%d][%d][%d] = %d \n",i,j,k,arr[i][j][k] );
            }
        }
    }

    return max;
}

int main()
{
    int arr[3][5][5] = {
                {102, 34, 75, 0, 88,
                110, 24, 5, 9, 8,
                150, 32, 5, 0, 1088,
                106, 3, 4, 9, 968,
                107, 2, 5, 0, 98},

                {102, 34, 75, 0, 88,
```

```
                110, 24, 5, 9, 8,
                150, 32, 5, 0, 10088,
                106, 3, 4, 9, 968,
                107, 2, 5, 0, 98},

                {102, 34, 75, 0, 88,
                110, 24, 5, 9, 8,
                150, 32, 5, 0, 1009,
                106, 3, 4, 9, 968,
                107, 2, 5, 0, 98}
                };

    //largest(arr);
    int n = sizeof(arr)/sizeof(arr[0][0][0]);

    printf("Largest in given array is %d\n", largest(arr, n));

    return 0;
}
```



Output:


Activities
Terminal
4:13
user@lab127-OptiPlex-3040: ~/Desktop/Lab5
File Edit View Search Terminal Help
2
Enter the position of an element to be deleted:
32
Invalid postion! should be within 1 and 3
Enter the value of value
3
Sum of all odd numbers = 4
Sum of all even numbers = 2
Enter 5 integer numbers, for first array
6
7
8
5
4
Enter 5 integer numbers, for second array
3
4
3
4
3
Merging a[5] and b[5] to form c[10] ..
Elements of c[10] is ..
6
7
8
5
4
3
4
3
4
3
user@lab127-OptiPlex-3040:~/Desktop/Lab5$ gcc q2.c -o q1
user@lab127-OptiPlex-3040:~/Desktop/Lab5$ ./q1
Largest in given array is 10088
user@lab127-OptiPlex-3040:~/Desktop/Lab5$

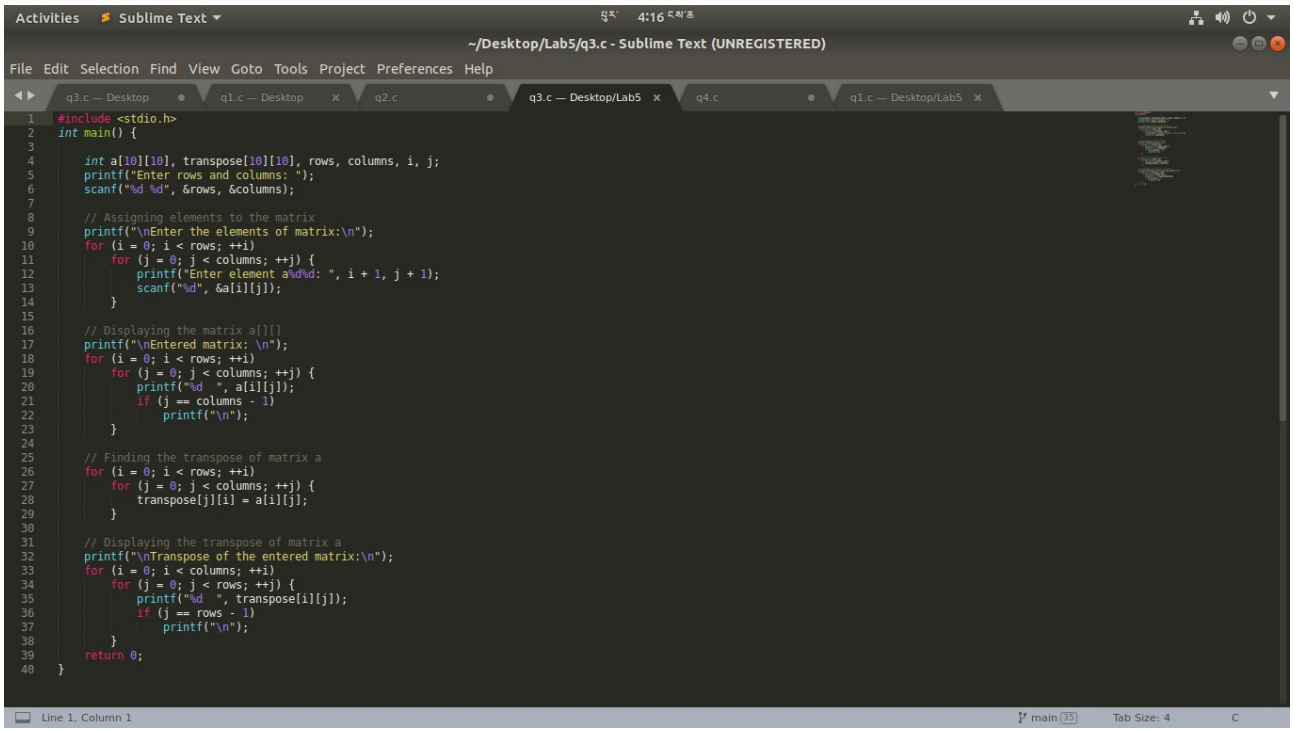
Question 3

WAP to find the transpose of a Matrix A. Transpose of a matrix is obtained by exchanging column elements with corresponding row elements.

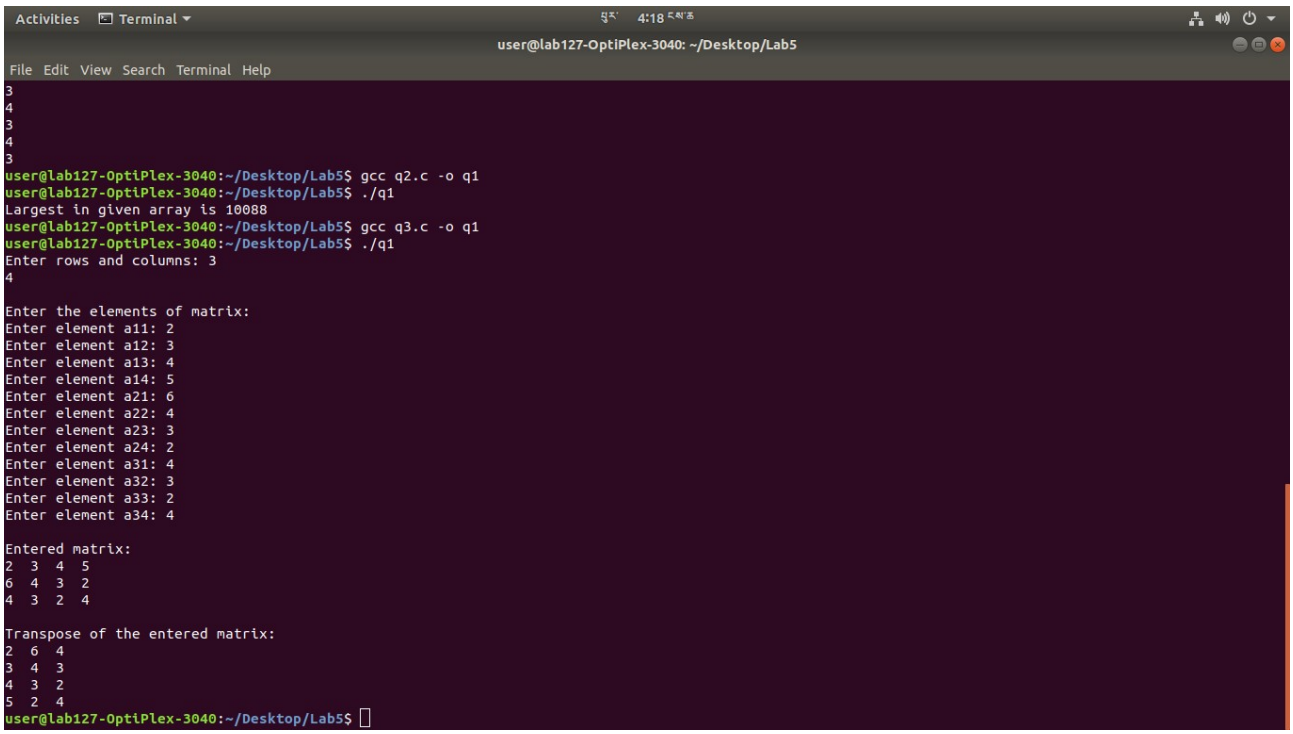
Answer:

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

    int a[10][10], transpose[10][10], rows, columns, i, j;
    printf("Enter rows and columns: ");
    scanf("%d %d", &rows, &columns);

    // Assigning elements to the matrix

    printf("\nEnter the elements of matrix:\n");

    for (i = 0; i < rows; ++i)

        for (j = 0; j < columns; ++j) {

            printf("Enter element a%d%d: ", i + 1, j + 1);
            scanf("%d", &a[i][j]);
        }

    // Displaying the matrix a[][]

    printf("\nEntered matrix: \n");

    for (i = 0; i < rows; ++i)

        for (j = 0; j < columns; ++j) {

            printf("%d  ", a[i][j]);

            if (j == columns - 1)
                printf("\n");
        }
```

```
    // Finding the transpose of matrix a
    for (i = 0; i < rows; ++i)
        for (j = 0; j < columns; ++j) {
            transpose[j][i] = a[i][j];
        }
    // Displaying the transpose of matrix a
    printf("\nTranspose of the entered matrix:\n");
    for (i = 0; i < columns; ++i)
        for (j = 0; j < rows; ++j) {
            printf("%d  ", transpose[i][j]);
            if (j == rows - 1)
                printf("\n");
        }
    return 0;
}
```


Activities
Sublime Text
4:16
~/Desktop/Lab5/q3.c - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
q3.c — Desktop
q1.c — Desktop
q2.c
q3.c — Desktop/Lab5
q4.c
q1.c — Desktop/Lab5
#include <stdio.h>
int main() {
int a[10][10], transpose[10][10], rows, columns, i, j;
printf("Enter rows and columns: ");
scanf("%d %d", &rows, &columns);
// Assigning elements to the matrix
printf("\nEnter the elements of matrix:\n");
for (i = 0; i < rows; ++i)
for (j = 0; j < columns; ++j) {
printf("Enter element a%d%d: ", i + 1, j + 1);
scanf("%d", &a[i][j]);
}
// Displaying the matrix a[][]
printf("\nEntered matrix: \n");
for (i = 0; i < rows; ++i)
for (j = 0; j < columns; ++j) {
printf("%d ", a[i][j]);
if (j == columns - 1)
printf("\n");
}
// Finding the transpose of matrix a
for (i = 0; i < rows; ++i)
for (j = 0; j < columns; ++j) {
transpose[j][i] = a[i][j];
}
// Displaying the transpose of matrix a
printf("\nTranspose of the entered matrix:\n");
for (i = 0; i < columns; ++i)
for (j = 0; j < rows; ++j) {
printf("%d ", transpose[i][j]);
if (j == rows - 1)
printf("\n");
}
return 0;
}
Line 1, Column 1
main
Tab Size: 4
C

Output:


Activities
Terminal
4:18
user@lab127-OptiPlex-3040: ~/Desktop/Lab5
File Edit View Search Terminal Help
3
4
3
4
3
user@lab127-OptiPlex-3040:~/Desktop/Lab5$ gcc q2.c -o q1
user@lab127-OptiPlex-3040:~/Desktop/Lab5$ ./q1
Largest in given array is 10088
user@lab127-OptiPlex-3040:~/Desktop/Lab5$ gcc q3.c -o q1
user@lab127-OptiPlex-3040:~/Desktop/Lab5$ ./q1
Enter rows and columns: 3
4
Enter the elements of matrix:
Enter element a11: 2
Enter element a12: 3
Enter element a13: 4
Enter element a14: 5
Enter element a21: 6
Enter element a22: 4
Enter element a23: 3
Enter element a24: 2
Enter element a31: 4
Enter element a32: 3
Enter element a33: 2
Enter element a34: 4
Entered matrix:
2 3 4 5
6 4 3 2
4 3 2 4
Transpose of the entered matrix:
2 6 4
3 4 3
4 3 2
5 2 4
user@lab127-OptiPlex-3040:~/Desktop/Lab5$

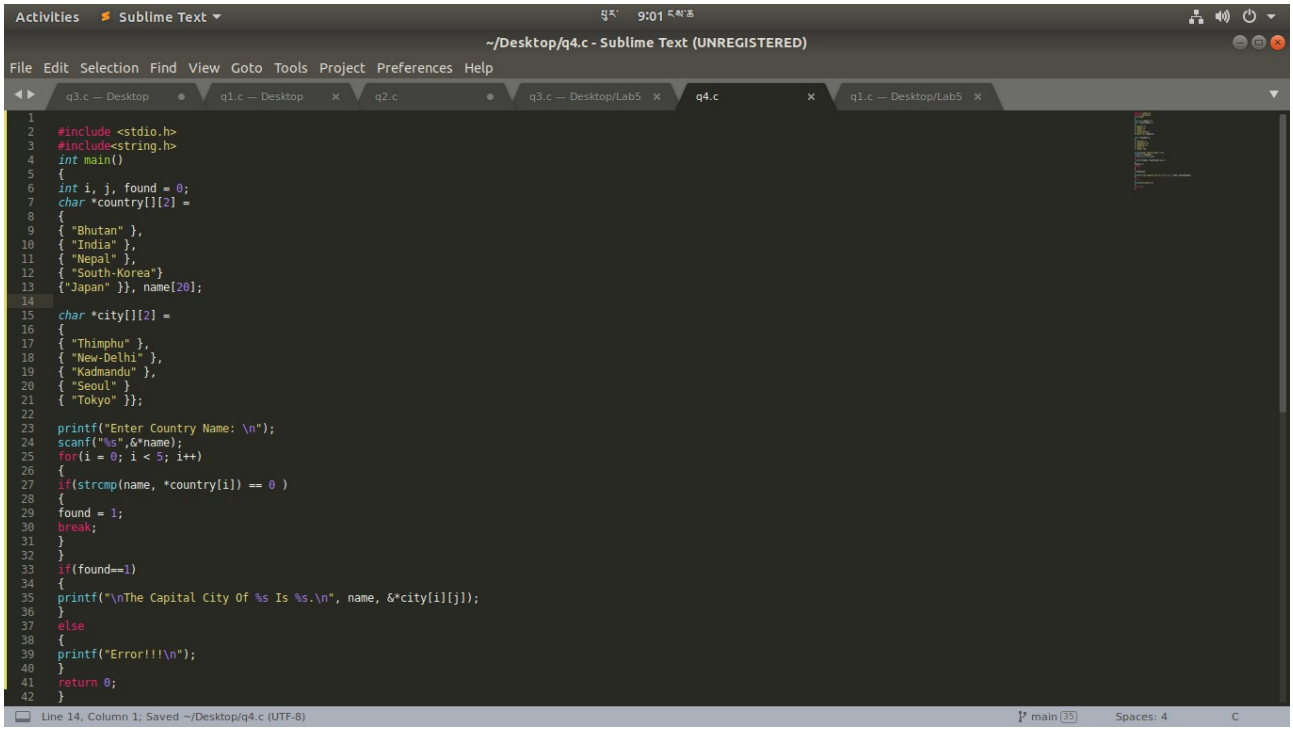
Question 4

WAP to enter a matrix with two columns. col1 represents the country name and col2 represents the capital. Then prompt the user asking to input the country's name and then your program should print the capital's name of the country as the output.

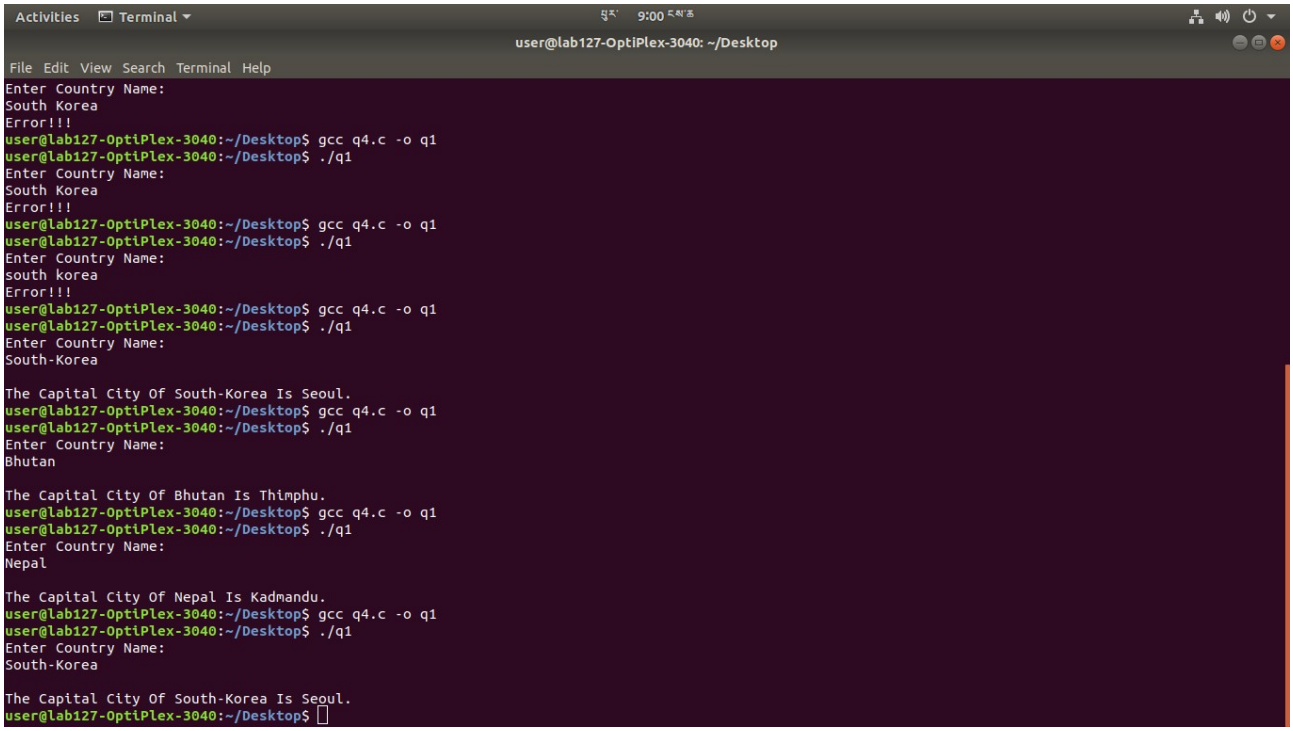
Answer:

```
#include <stdio.h>
#include<string.h>
int main()
{
int i, j, found = 0;
char *country[][2] =
{
{ "Bhutan" },
{ "India" },
{ "Nepal" },
{ "South-Korea"}
{"Japan" }}, name[20];

char *city[][2] =
{
{ "Thimphu" },
{ "New-Delhi" },
{ "Kadmandu" },
{ "Seoul" }
{ "Tokyo" }};

printf("Enter Country Name: \n");
scanf("%s",&*name);
for(i = 0; i < 6; i++)
{
if(strcmp(name, *country[i]) == 0 )
{
found = 1;
break;
}
}
```

```
if(found==1)
{
printf("\nThe Capital City Of %s Is %s.\n", name, &*city[i][j]);
}
else
{
printf("Error!!!\n");
}
return 0;
}
```



Output:


Activities
Terminal
9:00
user@lab127-OptiPlex-3040: ~/Desktop
File Edit View Search Terminal Help
Enter Country Name:
South Korea
Error!!!
user@lab127-OptiPlex-3040:~/Desktop$ gcc q4.c -o q1
user@lab127-OptiPlex-3040:~/Desktop$ ./q1
Enter Country Name:
South Korea
Error!!!
user@lab127-OptiPlex-3040:~/Desktop$ gcc q4.c -o q1
user@lab127-OptiPlex-3040:~/Desktop$ ./q1
Enter Country Name:
south korea
Error!!!
user@lab127-OptiPlex-3040:~/Desktop$ gcc q4.c -o q1
user@lab127-OptiPlex-3040:~/Desktop$ ./q1
Enter Country Name:
South-Korea
The Capital City Of South-Korea Is Seoul.
user@lab127-OptiPlex-3040:~/Desktop$ gcc q4.c -o q1
user@lab127-OptiPlex-3040:~/Desktop$ ./q1
Enter Country Name:
Bhutan
The Capital City Of Bhutan Is Thimphu.
user@lab127-OptiPlex-3040:~/Desktop$ gcc q4.c -o q1
user@lab127-OptiPlex-3040:~/Desktop$ ./q1
Enter Country Name:
Nepal
The Capital City Of Nepal Is Kadmandu.
user@lab127-OptiPlex-3040:~/Desktop$ gcc q4.c -o q1
user@lab127-OptiPlex-3040:~/Desktop$ ./q1
Enter Country Name:
South-Korea
The Capital City Of South-Korea Is Seoul.
user@lab127-OptiPlex-3040:~/Desktop$