Experiment No: 03
Experiment Name: 2D Array

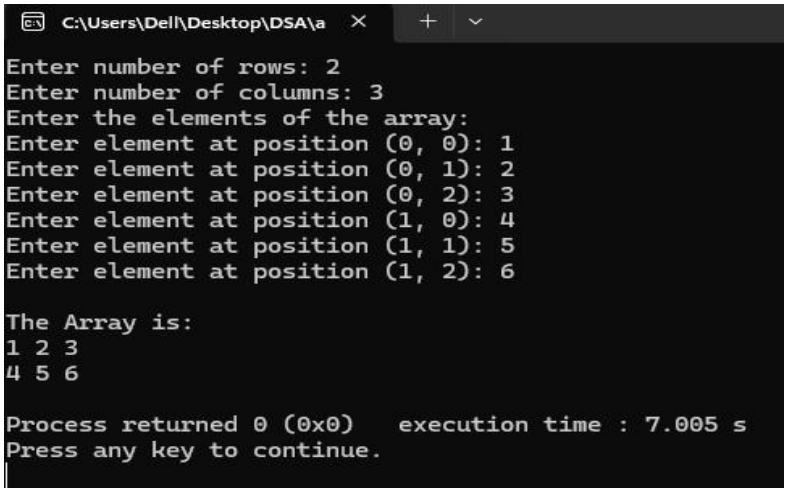
a) Initialize 2d Array.
Here we can declare and initialize a 2d array:
Source Code:
```
#include<stdio.h>
int main() {
int matrix[2][3]={ {1, 2, 3},
                   {4, 5, 6}};
printf("2D array initialized.");
return 0;
}
```

b) Take user input in 2D Array/Read elements of 2D Array.
This code will allow the user to input elements:
Source Code:
```
#include <stdio.h>
int main() {
int rows, cols;
printf("Enter number of rows: ");
scanf("%d", &rows);
printf("Enter number of columns: ");
scanf("%d", &cols);
int array[rows][cols];
printf("Enter the elements of the array:\n");
for(int i=0;i<rows;i++) {
for(int j=0; j < cols; j++) {
printf("Enter element at position (%d, %d): ", i, j);
scanf("%d", &array[i][j]);
}
}
printf("\nThe Array is:\n");
for(int i=0;i<rows;i++) {
for(int j=0;j<cols;j++) {
printf("%d ", array[i][j]);
}
printf("\n");
}
return 0;
}
```

c) Print elements of 2d Array.
Here we print the elements of the array:
Source Code:
```
#include <stdio.h>
int main() {
```

```
int rows, cols;
printf("Enter number of rows: ");
scanf("%d", &rows);
printf("Enter number of columns: ");
scanf("%d", &cols);
int array[rows][cols];
printf("Enter the elements of the array:\n");
for(int i=0;i<rows;i++) {
for(int j=0; j < cols; j++) {
printf("Enter element at position (%d, %d): ", i, j);
scanf("%d", &array[i][j]);
}
}
printf("\nThe Array is:\n");
for(int i=0;i<rows;i++) {
for(int j=0;j<cols;j++) {
printf("%d ", array[i][j]);
}
printf("\n");
}
return 0;
}
```

Output:



d) Initialize character array.

Here we initialized character array:

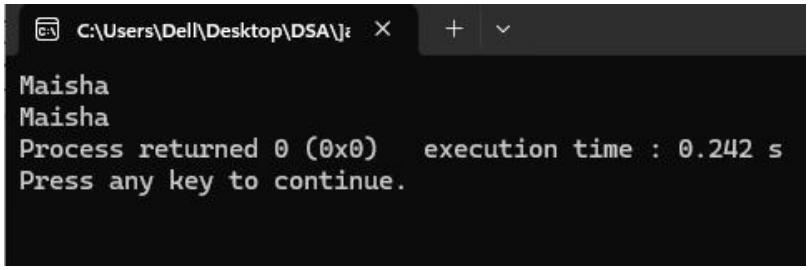
Source Code:

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

   char C[7]={'M', 'a', 'i', 's', 'h', 'a','\0'};
```

```
    char C1[7]="Maisha";
    printf("%s\n",C);
    printf("%s",C1);
    return 0;
}
```

Output:



Discussion: In today's lab we got knew about the 2d array. A 2D array is essentially a grid or matrix of elements arranged in rows and columns. The report tasks explores the fundamentals of 2D arrays, which are essential for understanding data organization in tabular formats. We Initialized the values in rows and columns. We took user input and output. We also iniatilazed character array.By mastering these concepts, we gain the ability to work with multi-dimensional data structures effectively.