



**Daffodil**  
*International*  
**University**

**LAB REPORT**

**Course Code: CSE 113**

**Course Title: Programming and Problem Solving**

**Experiment No: 5**

**Experiment Name: Basic C program**

**Submitted To:**

**Name: Dr. Sheak Rashed Haider Noori**

**Designation: Head of the Department**

**Department: CSE**

**Daffodil International University**

**Submitted By:**

**Name: TANVIR MAHATAB TANIM**

**ID: 242-15-893**

**Section: C**

**Semester: 1st**

**Department: CSE**

**Daffodil International University**

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## TANVIR MAHATAB TANIM

ID: 242-15-893

1. Write a c program, declare an array with a size of 5. Store 10, 20, 30, 40 and 50 in it and print them as output.

### Pseudo Code:

1. Declare an array arr of size 5 and initialize it with values {10, 20, 30, 40, 50}.
2. For each element in arr:
  - o Print the element.

### Code:

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

```
int main() {
```

```
    int arr[5] = {10, 20, 30, 40, 50};
```

```
    for (int i = 0; i < 5; i++) {
```

```
        printf("%d ", arr[i]);
```

```
    }
```

```
    return 0;
```

```
}
```

main.c	   Share 	Output
<pre>1  #include &lt;stdio.h&gt; 2 3  int main() { 4      int arr[5] = {10, 20, 30, 40, 50}; 5      for (int i = 0; i &lt; 5; i++) { 6          printf("%d ", arr[i]); 7      } 8      return 0; 9  } 10</pre>		<pre>/tmp/eNca9i35m1.o 10 20 30 40 50  === Code Execution Successful ===</pre>

2. Write a C program to take input from users and store them in an array. Take 4 even years as input.

### Pseudo Code:

1. Declare an array arr of size 4.
2. For each index in arr:
  - Prompt the user to enter an even year and store it in arr.
3. For each element in arr:
  - Print the element.

### Code:

```
#include <stdio.h>

int main() {

    int arr[4];

    for (int i = 0; i < 4; i++) {

        printf("Enter an even year: ");

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

    }

    for (int i = 0; i < 4; i++) {

        printf("%d\n", arr[i]);

    }

    return 0;

}
```

main.c	Run	Output
<pre>1 #include &lt;stdio.h&gt; 2 3 int main() { 4     int arr[4]; 5     for (int i = 0; i &lt; 4; i++) { 6         scanf("%d", &amp;arr[i]); 7     } 8     for (int i = 0; i &lt; 4; i++) { 9         printf("%d\n", arr[i]); 10    } 11    return 0; 12 } 13</pre>		<pre>/tmp/K2icVnmHLn.o 2000 2002 2004 2006 2000 2002 2004 2006  === Code Execution Successful ===</pre>

### 3. Write a c program to take input in an array and print it.

#### Pseudo Code:

1. Prompt the user to enter the array size n.
2. Declare an array arr of size n.
3. For each index in arr:
  - Prompt the user to enter a value and store it in arr.
4. Print each element in arr.

#### Code:

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

```
int main() {  
    int n, i;  
    printf("Enter array size: ");  
    scanf("%d", &n);  
    int arr[n];  
    for(i = 0; i < n; i++) {  
        scanf("%d", &arr[i]);  
    }  
    printf("Your elements: ");  
    for(i = 0; i < n; i++) {  
        printf("%d ", arr[i]);  
    }  
    printf("\n");  
    for(i = 0; i < n; i++) {  
        printf("a[%d] = %d\n", i, arr[i]);  
    }  
  
    return 0;  
}
```

main.c	Output
<pre>1 #include &lt;stdio.h&gt; 2 3 int main() { 4     int n, i; 5     printf("Enter array size: "); 6     scanf("%d", &amp;n); 7 8     int arr[n]; 9     for(i = 0; i &lt; n; i++) { 10         scanf("%d", &amp;arr[i]); 11     } 12     printf("Your elements: "); 13     for(i = 0; i &lt; n; i++) { 14         printf("%d ", arr[i]); 15     } 16     printf("\n"); 17     for(i = 0; i &lt; n; i++) { 18         printf("a[%d] = %d\n", i, arr[i]); 19     } 20     return 0; 21 } 22</pre>	<pre>/tmp/MsaZ1KnIyR.o Enter array size: 10 9 8 7 6 5 4 3 2 1 0 Your elements: 9 8 7 6 5 4 3 2 1 0 a[0] = 9 a[1] = 8 a[2] = 7 a[3] = 6 a[4] = 5 a[5] = 4 a[6] = 3 a[7] = 2 a[8] = 1 a[9] = 0  === Code Execution Successful ===</pre>

4. Write a C program to take 7 values from the user in an array. Use a loop to input those values from the user. As output, print those values.

**Pseudo Code:**

1. Declare an array arr of size 7.
2. For each index in arr:
  - o Prompt the user to enter a value and store it in arr.
3. Print each element in arr.

**Code:**

```
#include <stdio.h>

int main() {

    int arr[7];

    for (int i = 0; i < 7; i++) {

        printf("Enter value %d: ", i + 1);
```

```

scanf("%d", &arr[i]);
}
printf("Inputted values:\n");
for (int i = 0; i < 7; i++) {
    printf("%d\n", arr[i]);
}
return 0;
}

```

main.c	Run	Output
<pre> 1 #include &lt;stdio.h&gt; 2 int main() { 3     int arr[7]; 4     for (int i = 0; i &lt; 7; i++) { 5         scanf("%d", &amp;arr[i]); 6     } 7     printf("Inputted values:\n"); 8     for (int i = 0; i &lt; 7; i++) { 9         printf("%d\n", arr[i]); 10    } 11    return 0; 12 } 13 </pre>	Run	<pre> /tmp/vAIaici2yt.o 5 10 15 20 25 30 35 Inputted values: 5 10 15 20 25 30 35  === Code Execution Successful === </pre>

5. Write a C program to take 7 values from the user in an array. Now input values in that array and print the values in reverse order

### Pseudo Code:

1. Declare an array arr of size 7.
2. For each index in arr:
  - o Prompt the user to enter a value and store it in arr.
3. For each element in arr, starting from the last element to the first:
  - o Print the element.

## Code:

```
#include <stdio.h>

int main() {

    int arr[7];

    for (int i = 0; i < 7; i++) {

        printf("Enter value %d: ", i + 1);

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

    }

    printf("Values in reverse order:\n");





    for (int i = 6; i >= 0; i--) {

        printf("%d\n", arr[i]);

    }

    return 0;

}
```

main.c		Output
<pre>1  #include &lt;stdio.h&gt; 2 3  int main() { 4      int arr[7]; 5      for (int i = 0; i &lt; 7; i++) { 6          scanf("%d", &amp;arr[i]); 7      } 8      printf("Inputted values:\n"); 9      for (int i = 6; i &gt;= 0; i--) { 10         printf("%d\n", arr[i]); 11     } 12     return 0; 13 } 14</pre>	<div> Share </div>	<pre>/tmp/lpVaIRlW5S.o 5 10 15 20 25 30 35 Inputted values: 35 30 25 20 15 10 5  === Code Execution Successful ===</pre>

6. Write a c program to take input n times. Here the value of n will be user defined.

As output, print the inputted values.

**Pseudo Code:**

1. Prompt the user to enter the array size n.
2. Declare an array arr of size n.
3. For each index in arr:
  - Prompt the user to enter a value and store it in arr.
4. Print each element in arr.

**Code:**

```
#include <stdio.h>

int main() {

    int n;

    printf("Enter array size: ");

    scanf("%d", &n);

    int arr[n];

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

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

    }

    printf("Your values:\n");

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

        printf("%d\n", arr[i]);

    }

    return 0;

}
```



main.c	Output
<pre>1 #include &lt;stdio.h&gt; 2 3 int main() { 4     int n; 5     printf("Enter array size: "); 6     scanf("%d", &amp;n); 7     int arr[n]; 8     for (int i = 0; i &lt; n; i++) { 9         scanf("%d", &amp;arr[i]); 10    } 11    printf("Your values:\n"); 12    for (int i = 0; i &lt; n; i++) { 13        printf("%d\n", arr[i]); 14    } 15    return 0; 16 } 17</pre>	<pre>/tmp/gq3gAcVocK.o Enter array size: 3 4 5 6 Your values: 4 5 6  === Code Execution Successful ===</pre>

7. Write a c program to take 10 user input in an array and print the sum of those 10 values

**Pseudo Code:**

1. Declare an array arr of size 10 and a variable sum initialized to 0.
2. For each index in arr:
  - o Prompt the user to enter a value and store it in arr.
  - o Add the value to sum.
3. Print sum.

**Code:**

```
#include <stdio.h>

int main() {

    int arr[10], sum = 0;

    for (int i = 0; i < 10; i++) {

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

        sum += arr[i];

    }

    printf("Sum = %d\n", sum);
```

```
return 0;

}
```

main.c	Output
<pre>1 #include &lt;stdio.h&gt; 2 3 int main() { 4     int n, sum=0; 5     printf("Enter array size: "); 6     scanf("%d", &amp;n); 7     int arr[n]; 8     for (int i = 0; i &lt; 10; i++) { 9         scanf("%d", &amp;arr[i]); 10        sum += arr[i]; 11    } 12    printf("Sum = %d\n", sum); 13    return 0; 14 } 15</pre>	<pre>/tmp/IIh41JfcTc.o Enter array size: 10 9 8 7 6 5 4 3 2 1 0 Sum = 45  === Code Execution Successful ===</pre>

8. Write a C program that would calculate the average of all the elements in an array.

**Pseudo Code:**

1. Declare an array arr of size 10 and a variable sum initialized to 0.
2. For each index in arr:
  - o Prompt the user to enter a value and store it in arr.
  - o Add the value to sum.
3. Calculate the average by dividing sum by 10.
4. Print the average.

**Code:**

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

```
int main() {
```

```
    int arr[10], sum = 0;
```

```
    float avg;
```

```

for (int i = 0; i < 10; i++) {

    printf("Enter value %d: ", i + 1);

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

    sum += arr[i];

}

avg = sum / 10.0; // Calculating the average

printf("Average = %.2f\n", avg);

return 0;

}

```

main.c	Run	Output
<pre> 1  #include &lt;stdio.h&gt; 2 3  int main() { 4      int arr[3], sum = 0; 5      float avg; 6      printf("Enter Array Elements:\n"); 7 8      for (int i = 0; i &lt; 3; i++) { 9          scanf("%d", &amp;arr[i]); 10         sum += arr[i]; 11     } 12     avg = sum / 3.0; 13     printf("Avg = %.2f\n", avg); 14     return 0; 15 } 16 </pre>	Run	<pre> /tmp/g6h7Qxh9bn.o Enter Array Elements: 10 15 15 Avg = 13.33  === Code Execution Successful === </pre>

## 9. Write a C program to find the maximum value in an array

### Pseudo Code:

1. Declare an array arr of size 10.
2. For each index in arr:
  - o Prompt the user to enter a value and store it in arr.
3. Set max to the first element of arr.
4. For each element in arr:
  - o If the element is greater than max, update max.
5. Print max.

## Code:

```
#include <stdio.h>

int main() {

    int arr[10], max;

    printf("Enter 10 values:\n");

    for (int i = 0; i < 10; i++) {

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

        if (i == 0 || arr[i] > max) {

            max = arr[i];


        }

    }

    printf("Maximum: %d\n", max);

    return 0;

}
```

main.c	   Share 	Output
<pre>1 #include &lt;stdio.h&gt; 2 3 int main() { 4     int n; 5     printf("Array size: "); 6     scanf("%d", &amp;n); 7     int arr[n], max; 8     for (int i = 0; i &lt; n; i++) { 9         scanf("%d", &amp;arr[i]); 10        if (i == 0    arr[i] &gt; max) { 11            max = arr[i]; 12        } 13    } 14    printf("Maximum: %d\n", max); 15    return 0; 16 } 17</pre>	<pre>/tmp/Iwivqah30Z.o Array size: 10 9 8 7 6 5 4 3 2 1 0 Maximum: 9  === Code Execution Successful ===</pre>	

## 10. Finding Maximum Element in a 2D Array

**Task:** Write a program to find the maximum value in a 3x3 array.

### Pseudo Code:

1. Declare a 3x3 matrix matrix.
2. For each element in matrix:
  - Prompt the user to enter a value and store it in matrix.
3. Set max to the first element in matrix.
4. For each element in matrix:
  - If the element is greater than max, update max.
5. Print max.

### Code:

```
#include <stdio.h>

int main() {
    int matrix[3][3], max;
    printf("Enter 9 elements:\n");
    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 3; j++) {
            scanf("%d", &matrix[i][j]);
            if ((i == 0 && j == 0) || matrix[i][j] > max) {
                max = matrix[i][j];
            }
        }
    }
    printf("Maximum element = %d\n", max);
    return 0;
}
```

main.c		Output
<pre>1 #include &lt;stdio.h&gt; 2 3 int main() { 4     int arr[3][3], max; 5     printf("Enter 9 elements:"); 6     for (int i = 0; i &lt; 3; i++) { 7         for (int j = 0; j &lt; 3; j++) { 8             scanf("%d", &amp;arr[i][j]); 9             if (i == 0 &amp;&amp; j == 0) max = arr[i][j]; 10            if (arr[i][j] &gt; max) max = arr[i][j]; 11        } 12    } 13    printf("Maximum element = %d\n", max); 14    return 0; 15 } 16</pre>	<div>🔍 🌙 🔗 Share <span>Run</span></div> <pre>/tmp/SjIYBePmmp.o Enter 9 elements:5 3 9 1 6 8 2 7 4 Maximum element = 9  === Code Execution Successful ===</pre>	

## 11: Finding Maximum Element in a 2D Array

Task: Write a program to find the maximum value in a row, column array.

### Pseudo Code:

1. Declare a 3x3 matrix matrix.
2. For each element in matrix:
  - Prompt the user to enter a value and store it in matrix.
3. Set max to the first element in matrix.
4. For each element in matrix:
  - If the element is greater than max, update max.
5. Print max.

Code:

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

```
int main() {
```

```
    int matrix[3][3], max;
```

```
    printf("Enter 9 elements:\n");
```

```
    for (int i = 0; i < 3; i++) {
```

```
        for (int j = 0; j < 3; j++) {
```

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

```

        if ((i == 0 && j == 0) || matrix[i][j] > max) {
            max = matrix[i][j];
        }
    }
}

printf("Maximum element = %d\n", max);

return 0;
}

```

main.c	Run	Output
<pre> 1  #include &lt;stdio.h&gt; 2 3  int main() { 4      int arr[3][3], max; 5      printf("Enter 9 elements:"); 6      for (int i = 0; i &lt; 3; i++) { 7          for (int j = 0; j &lt; 3; j++) { 8              scanf("%d", &amp;arr[i][j]); 9              if (i == 0 &amp;&amp; j == 0) max = arr[i][j]; 10             if (arr[i][j] &gt; max) max = arr[i][j]; 11         } 12     } 13     printf("Maximum element = %d\n", max); 14     return 0; 15 } 16 </pre>	<div>Run</div>	<pre> /tmp/yB2Zg6cdBn.o Enter 9 elements:5 3 12 1 6 8 2 7 4 Maximum element = 12  === Code Execution Successful === </pre>

## 12: Transposing a Matrix

Task: Transpose a 2x3 matrix and print the result as a 3x2 matrix.

### Pseudo Code:

1. Declare a 2x3 matrix matrix and a 3x2 matrix transpose.
2. For each element in matrix:
  - o Prompt the user to enter a value and store it in matrix.
3. For each element in matrix:
  - o Set the corresponding element in transpose to its transposed position.
4. Print each element in transpose.

### Code:

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

```

int main() {

    int matrix[2][3], transpose[3][2];

    printf("Enter 6 elements:\n");

    for (int i = 0; i < 2; i++) {

        for (int j = 0; j < 3; j++) {

            scanf("%d", &matrix[i][j]);

            transpose[j][i] = matrix[i][j];

        }

    }

    printf("Transpose:\n");

    for (int i = 0; i < 3; i++) {

        for (int j = 0; j < 2; j++) {

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

        }

        printf("\n");

    }

    return 0;

}

```

main.c	Run	Output
<pre> 1  #include &lt;stdio.h&gt; 2 3  int main() { 4      int matrix[2][3], transpose[3][2]; 5      printf("Enter matrix elements:"); 6      for (int i = 0; i &lt; 2; i++) { 7          for (int j = 0; j &lt; 3; j++) { 8              scanf("%d", &amp;matrix[i][j]); 9              transpose[j][i] = matrix[i][j]; 10         } 11     } 12     for (int i = 0; i &lt; 3; i++) { 13         for (int j = 0; j &lt; 2; j++) { 14             printf("%d ", transpose[i][j]); 15         } 16         printf("\n"); 17     } 18     return 0; 19 } 20 </pre>	<div> </div> <div>Run</div>	<pre> /tmp/ysJtJe4Maj.o Enter matrix elements:1 2 3 4 5 6 1 4 2 5 3 6  === Code Execution Successful === </pre>



## 13: Matrix Addition

**Task:** Write a program to add two 2x2 matrices and print the result

### Pseudo Code:

1. Declare two 2x2 matrices A and B and a 2x2 matrix result.
2. For each element in A:
  - Prompt the user to enter a value and store it in A.
3. For each element in B:
  - Prompt the user to enter a value and store it in B.
4. For each element in A and B:
  - Set the corresponding element in result as the sum of A and B.
5. Print each element in result.

### Code:

```
#include <stdio.h>

int main() {

    int A[2][2], B[2][2], result[2][2];

    printf("Enter elements for Matrix A:\n");

    for (int i = 0; i < 2; i++) {

        for (int j = 0; j < 2; j++) {

            scanf("%d", &A[i][j]);

        }

    }

    printf("Enter elements for Matrix B:\n");

    for (int i = 0; i < 2; i++) {

        for (int j = 0; j < 2; j++) {

            scanf("%d", &B[i][j]);

            result[i][j] = A[i][j] + B[i][j];

        }

    }

    printf("Resultant Matrix:\n");
```

```

for (int i = 0; i < 2; i++) {

    for (int j = 0; j < 2; j++) {

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

    }





    printf("\n");

}

return 0;

}

```

main.c	   Share  Run	Output
<pre> 1  #include &lt;stdio.h&gt; 2 3- int main() { 4      int A[2][2], B[2][2], result[2][2]; 5      printf("Matrix A:"); 6      for (int i = 0; i &lt; 2; i++) 7          for (int j = 0; j &lt; 2; j++) 8              scanf("%d", &amp;A[i][j]); 9 10     printf("Matrix B:"); 11     for (int i = 0; i &lt; 2; i++) 12         for (int j = 0; j &lt; 2; j++) 13             scanf("%d", &amp;B[i][j]); 14 15     for (int i = 0; i &lt; 2; i++) 16         for (int j = 0; j &lt; 2; j++) 17             result[i][j] = A[i][j] + B[i][j]; 18 19     printf("Resultant Matrix:\n"); 20-    for (int i = 0; i &lt; 2; i++) { 21-        for (int j = 0; j &lt; 2; j++) { 22            printf("%d ", result[i][j]); 23        } 24        printf("\n"); 25    } 26    return 0; 27 } 28 </pre>	<pre> /tmp/7r19lU0ZOP.o Matrix A:1 2 3 4 Matrix B:5 6 7 8 Resultant Matrix: 6 8 10 12  === Code Execution Successful === </pre>	

## 14: Grading System - Average Marks Calculation

**Task:** Write a program to calculate the average marks of 4 students in 3 subjects

### Pseudo Code:

1. Declare a 2D array marks with 4 rows (students) and 3 columns (subjects).
2. For each student:
  - Initialize sum to 0.
  - For each subject:
    - Prompt the user to enter the marks and store it in marks.
    - Add marks to sum.
  - Calculate the average by dividing sum by 3.
  - Store the average in an array avg.
3. Print each student's average from avg.

### Code:

```
#include <stdio.h>

int main() {
    int marks[4][3];
    float avg[4];
    for (int i = 0; i < 4; i++) {
        int sum = 0;
        for (int j = 0; j < 3; j++) {
            scanf("%d", &marks[i][j]);
            sum += marks[i][j];
        }
        avg[i] = sum / 3.0;
    }
    for (int i = 0; i < 4; i++) {
        printf("Average marks for student %d: %.2f\n", i + 1, avg[i]);
    }
    return 0;
}
```

}

main.c	Output
<pre>1 #include &lt;stdio.h&gt; 2 3 int main() { 4     int marks[4][3]; 5     float avg[4]; 6     for (int i = 0; i &lt; 4; i++) { 7         printf("Marks of student %d: ", i + 1); 8         int sum = 0; 9         for (int j = 0; j &lt; 3; j++) { 10             scanf("%d", &amp;marks[i][j]); 11             sum += marks[i][j]; 12         } 13         avg[i] = sum / 3.0; 14     } 15     for (int i = 0; i &lt; 4; i++) { 16         printf("Average marks for student %d: %.2f\n", i + 1, avg[i]); 17     } 18     return 0; 19 } 20</pre>	<pre>/tmp/wemce9tAKg.o Marks of student 1: 70 80 90 Marks of student 2: 60 75 85 Marks of student 3: 95 80 70 Marks of student 4: 50 65 75 Average marks for student 1: 80.00 Average marks for student 2: 73.33 Average marks for student 3: 81.67 Average marks for student 4: 63.33  === Code Execution Successful ===</pre>

Thank You