



C++ Exercises



1. Write a program that uses a for loop to print the multiplication table of a number entered by the user.
2. Write a program that uses a for loop to print a pyramid of stars with a specified number of rows.
3. Write a program that uses a for loop to print a diamond of stars with a specified number of rows.
4. Write a program that uses a for loop to print a right triangle of stars with a specified number of rows.
5. Write a program that uses a for loop to print a rectangle of stars with a specified number of rows and columns.
6. Write a program that uses a for loop to reverse the order of the elements in an array of integers.
7. Write a program that uses a for loop to sort an array of integers in ascending order.
8. Write a program that uses a for loop to sort an array of integers in descending order.
9. Write a program that uses a for loop to calculate the average of an array of floating-point numbers.
10. Write a program that uses a for loop to find the median of an array of integers.



C++ Exercises and Solution



1. Write a program that uses a for loop to print the multiplication table of a number entered by the user.

```
#include <iostream>

using namespace std;

int main() {
    int num;

    cout << "Enter a number: ";
    cin >> num;

    cout << "Multiplication table of " << num << ":" << endl;
    for (int i = 1; i <= 10; ++i) {
        cout << num << " x " << i << " = " << num * i << endl;
    }

    return 0;
}
```

2. Write a program that uses a for loop to print a pyramid of stars with a specified number of rows.

```
#include <iostream>

using namespace std;

int main() {
    int rows;

    cout << "Enter the number of rows: ";
```

```
cin >> rows;
```

```
for (int i = 1; i <= rows; ++i) {  
    for (int j = 1; j <= rows - i; ++j) {  
        cout << " ";  
    }  
    for (int k = 1; k <= 2 * i - 1; ++k) {  
        cout << "*";  
    }  
    cout << endl;  
}
```

```
return 0;
```

```
}
```

3. Write a program that uses a for loop to print a diamond of stars with a specified number of rows.

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
    int rows;
```

```
    cout << "Enter the number of rows: ";
```

```
    cin >> rows;
```

```
    for (int i = 1; i <= rows; ++i) {  
        for (int j = 1; j <= rows - i; ++j) {  
            cout << " ";  
        }  
        for (int k = 1; k <= 2 * i - 1; ++k) {  
            cout << "*";  
        }  
    }
```

```

    }
    cout << endl;
}
for (int i = rows - 1; i >= 1; --i) {
    for (int j = 1; j <= rows - i; ++j) {
        cout << " ";
    }
    for (int k = 1; k <= 2 * i - 1; ++k) {
        cout << "*";
    }
    cout << endl;
}

return 0;
}

```

4. Write a program that uses a for loop to print a right triangle of stars with a specified number of rows.

```

#include <iostream>
using namespace std;

int main() {
    int rows;

    cout << "Enter the number of rows: ";
    cin >> rows;

    for (int i = 1; i <= rows; ++i) {
        for (int j = 1; j <= i; ++j) {
            cout << "*";
        }
        cout << endl;
    }
}

```

```
}
```

```
return 0;
```

```
}
```

5. Write a program that uses a for loop to print a rectangle of stars with a specified number of rows and columns.

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
    int rows, cols;
```

```
    cout << "Enter the number of rows: ";
```

```
    cin >> rows;
```

```
    cout << "Enter the number of columns: ";
```

```
    cin >> cols;
```

```
    for (int i = 1; i <= rows; ++i) {
```

```
        for (int j = 1; j <= cols; ++j) {
```

```
            cout << "*";
```

```
        }
```

```
        cout << endl;
```

```
    }
```

```
    return 0;
```

```
}
```

6. Write a program that uses a for loop to reverse the order of the elements in an array of integers.

```
#include <iostream>
```

```
using namespace std;
```

```
int main()
{
    const int SIZE = 5;
    int arr[SIZE];

    //populate the array with user input
    cout << "Enter " << SIZE << " integers: ";
    for(int i=0; i<SIZE; i++)
    {
        cin >> arr[i];
    }

    //print original array
    cout << "Original array: ";
    for(int i=0; i<SIZE; i++)
    {
        cout << arr[i] << " ";
    }

    //reverse the array
    for(int i=0; i<SIZE/2; i++)
    {
        int temp = arr[i];
        arr[i] = arr[SIZE-1-i];
        arr[SIZE-1-i] = temp;
    }

    //print reversed array
    cout << "\nReversed array: ";
    for(int i=0; i<SIZE; i++)
    {
```

```
        cout << arr[j] << " ";
    }

    return 0;
}
```

7. Write a program that uses a for loop to sort an array of integers in ascending order.

```
#include <iostream>
using namespace std;

int main()
{
    const int SIZE = 5;
    int arr[SIZE];

    //populate the array with user input
    cout << "Enter " << SIZE << " integers: ";
    for(int i=0; i<SIZE; i++)
    {
        cin >> arr[i];
    }

    //print original array
    cout << "Original array: ";
    for(int i=0; i<SIZE; i++)
    {
        cout << arr[i] << " ";
    }

    //sort the array in ascending order
    for(int i=0; i<SIZE-1; i++)
    {
```

```

        for(int j=i+1; j<SIZE; j++)
        {
            if(arr[i] > arr[j])
            {
                int temp = arr[i];
                arr[i] = arr[j];
                arr[j] = temp;
            }
        }
    }

//print sorted array
cout << "\nSorted array (ascending): ";
for(int i=0; i<SIZE; i++)
{
    cout << arr[i] << " ";
}
return 0;}

```

8. Write a program that uses a for loop to sort an array of integers in descending order.

```

#include <iostream>
using namespace std;

int main()
{
    const int SIZE = 5;
    int arr[SIZE];

//populate the array with user input
cout << "Enter " << SIZE << " integers: ";
for(int i=0; i<SIZE; i++)
{

```



```

    cin >> arr[i];
}

//print original array
cout << "Original array: ";
for(int i=0; i<SIZE; i++)
{
    cout << arr[i] << " ";
}

//sort the array in descending order
for(int i=0; i<SIZE-1; i++)
{
    for(int j=i+1; j<SIZE; j++)
    {
        if(arr[i] < arr[j])
        {
            int temp = arr[i];
            arr[i] = arr[j];
            arr[j] = temp;
        }
    }
}

```

```

//print sorted array
cout << "\nSorted array (descending): ";
for(int i=0; i<SIZE; i

```

9. Write a program that uses a for loop to calculate the average of an array of floating-point numbers.

```

#include <iostream>
using namespace std;

```

```

int main() {
    const int SIZE = 5;
    float numbers[SIZE] = { 2.5, 3.6, 1.2, 4.0, 2.0 };
    float sum = 0.0;
    float average = 0.0;

    for (int i = 0; i < SIZE; i++) {
        sum += numbers[i];
    }

    average = sum / SIZE;

    cout << "The average of the numbers is " << average << endl;

    return 0;
}

```

10. Write a program that uses a for loop to find the median of an array of integers.

```

#include <iostream>
#include <algorithm>
using namespace std;

int main() {
    const int SIZE = 5;
    int numbers[SIZE] = { 10, 7, 15, 3, 9 };

    sort(numbers, numbers + SIZE);

    if (SIZE % 2 == 0) {
        int mid = SIZE / 2;

```

```
float median = (float)(numbers[mid - 1] + numbers[mid]) / 2;
cout << "The median of the numbers is " << median << endl;
}
else {
int mid = SIZE / 2;
float median = numbers[mid];
cout << "The median of the numbers is " << median << endl;
}

return 0;
}
```