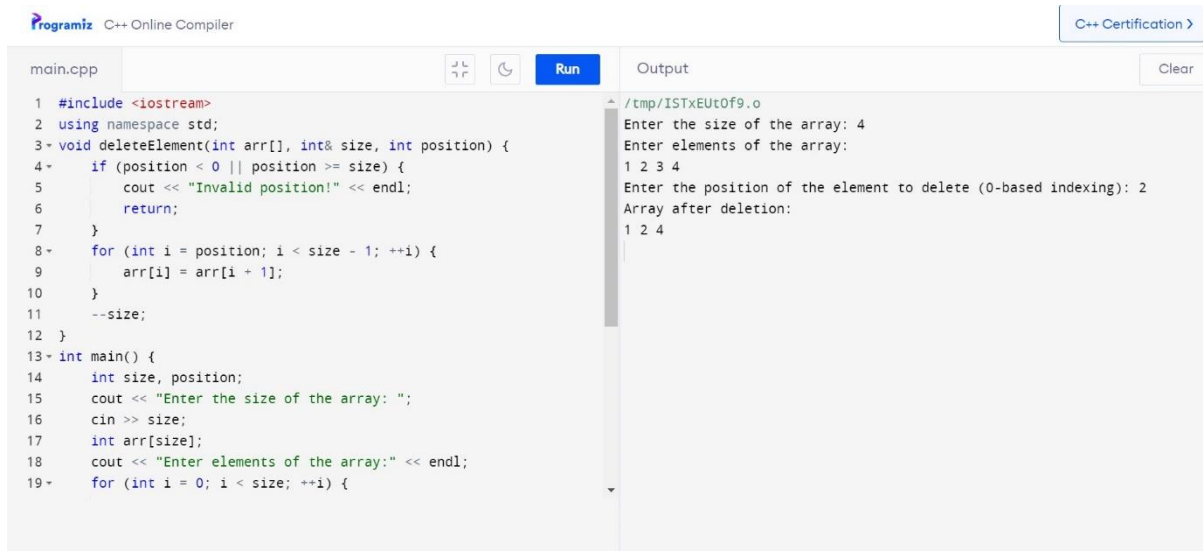


# MODEL EXAM

27/02/24

## DSA0179-C++ PROGRAMMING

### 1)DELETE AN ELEMENT IN ARRAY:



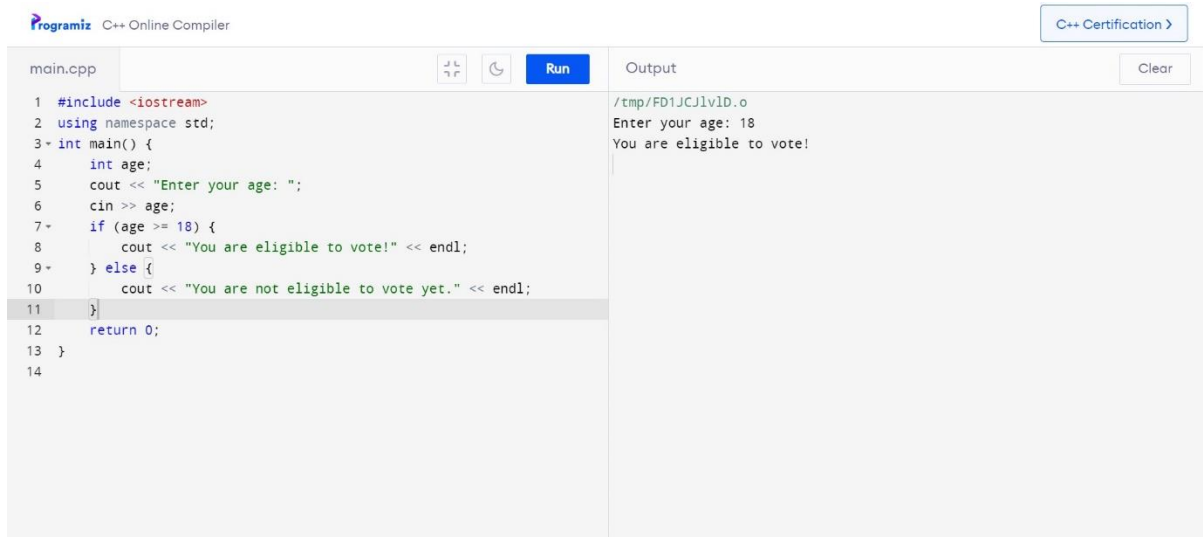
The screenshot shows the Programiz C++ Online Compiler interface. The code in main.cpp defines a function deleteElement that shifts elements to the right of a given position and then removes the element at that position. The main function prompts the user for array size, elements, and the position to delete, then displays the resulting array.

```
1 #include <iostream>
2 using namespace std;
3 void deleteElement(int arr[], int& size, int position) {
4     if (position < 0 || position >= size) {
5         cout << "Invalid position!" << endl;
6         return;
7     }
8     for (int i = position; i < size - 1; ++i) {
9         arr[i] = arr[i + 1];
10    }
11    --size;
12 }
13 int main() {
14     int size, position;
15     cout << "Enter the size of the array: ";
16     cin >> size;
17     int arr[size];
18     cout << "Enter elements of the array:" << endl;
19     for (int i = 0; i < size; ++i) {
```

Output:

```
/tmp/ISTxEutOf9.o
Enter the size of the array: 4
Enter elements of the array:
1 2 3 4
Enter the position of the element to delete (0-based indexing): 2
Array after deletion:
1 2 4
```

### 2)ELIGIBLE FOR VOTE:



The screenshot shows the Programiz C++ Online Compiler interface. The code in main.cpp prompts the user for their age and checks if they are 18 or older. If eligible, it prints "You are eligible to vote!"; otherwise, it prints "You are not eligible to vote yet.".

```
1 #include <iostream>
2 using namespace std;
3 int main() {
4     int age;
5     cout << "Enter your age: ";
6     cin >> age;
7     if (age >= 18) {
8         cout << "You are eligible to vote!" << endl;
9     } else {
10        cout << "You are not eligible to vote yet." << endl;
11    }
12    return 0;
13 }
14
```

Output:

```
/tmp/FD1JCJlv1D.o
Enter your age: 18
You are eligible to vote!
```

### 3)PERFECT NUMBER & ARMSTRONG NUMBER:

The screenshot shows the Programiz C++ Online Compiler interface. The code in the editor is as follows:

```
1 #include <iostream>
2 #include <cmath>
3 using namespace std;
4 bool isArmstrong(int num) {
5     int originalNum, remainder, n = 0, result = 0;
6     originalNum = num;
7     while (originalNum != 0) {
8         originalNum /= 10;
9         ++n;
10    }
11    originalNum = num;
12    while (originalNum != 0) {
13        remainder = originalNum % 10;
14        result += pow(remainder, n);
15        originalNum /= 10;
16    }
17    return result == num;
18 }
19 int main() {
```

The output window shows the following text:

```
/tmp/PqPU25G1FY.o
Enter a number: 123
123 is not an Armstrong number.
```

The Windows taskbar at the bottom shows the date and time as 11:45 on 27-02-2024.

The screenshot shows the Programiz C++ Online Compiler interface. The code in the editor is as follows:

```
1 #include <iostream>
2 using namespace std;
3 bool isPerfect(int num) {
4     int sum = 0;
5     for (int i = 1; i <= num / 2; ++i) {
6         if (num % i == 0) {
7             sum += i;
8         }
9     }
10    return sum == num;
11 }
12 int main() {
13     int number;
14     cout << "Enter a number: ";
15     cin >> number;
16     if (isPerfect(number)) {
17         cout << number << " is a perfect number." << endl;
18     } else {
19         cout << number << " is not a perfect number." << endl;
```

The output window shows the following text:

```
/tmp/PqPU25G1FY.o
Enter a number: 5
5 is not a perfect number.
```

#### 4) FIBONACCI SERIES:

Programiz C++ Online Compiler [C++ Certification >](#)

```
main.cpp Run Output Clear
2 using namespace std;
3 void fibonacci(int limit) {
4     int a = 0, b = 1, c;
5     cout << "Fibonacci Series up to " << limit << " terms:" <<
        endl;
6     cout << a << " " << b << " ";
7     for (int i = 2; i < limit; ++i) {
8         c = a + b;
9         cout << c << " ";
10        a = b;
11        b = c;
12    }
13 }
14 int main() {
15     int limit;
16     cout << "Enter the limit for Fibonacci series: ";
17     cin >> limit;
18     fibonacci(limit);
19     return 0;
}
```

/tmp/v7fIH0Iaa8.o  
Enter the limit for Fibonacci series: 3  
Fibonacci Series up to 3 terms:  
0 1 1

Waiting for console input or double click on the output area

## 6)PRIME OR NOT

Programiz C++ Online Compiler [C++ Certification >](#)

```
main.cpp Run Output Clear
1 #include <iostream>
2 #include <cmath>
3 using namespace std;
4 bool isPrime(int num) {
5     if (num <= 1) {
6         return false;
7     }
8     for (int i = 2; i <= sqrt(num); ++i) {
9         if (num % i == 0) {
10            return false;
11        }
12    }
13    return true;
14 }
15
16 int main() {
17     int number;
18
19     cout << "Enter a number: ";
}
```

/tmp/PqPU2SG1FY.o  
Enter a number: 7  
7 is a prime number.

## 7)SUM OF DIAGONALS IN MATRIX:

Programiz C++ Online Compiler

C++ Certification >

main.cpp

Run

```
1 #include <iostream>
2 using namespace std;
3 const int MAX_SIZE = 100;
4 void sumOfDiagonals(int matrix[][MAX_SIZE], int n) {
5     int primaryDiagonalSum = 0, secondaryDiagonalSum = 0;
6     for (int i = 0; i < n; ++i) {
7         primaryDiagonalSum += matrix[i][i];
8         secondaryDiagonalSum += matrix[i][n - i - 1];
9     }
10    cout << "Sum of primary diagonal: " << primaryDiagonalSum
11           << endl;
12    cout << "Sum of secondary diagonal: " <<
13          secondaryDiagonalSum << endl;
14 }
15 int main() {
16     int n;
17     int matrix[MAX_SIZE][MAX_SIZE];
18     cout << "Enter the size of the square matrix: ";
19     cin >> n;
```

Output

Clear

```
/tmp/o0ykb7Q6AZ.o
Enter the size of the square matrix: 2
Enter the elements of the matrix:
1 2
2 4
Sum of primary diagonal: 5
Sum of secondary diagonal: 4
```

## 8) EMPLOYEE PROBLEM-USING CLASS:

Programiz C++ Online Compiler

C++ Certification >

main.cpp

Run

```
1 #include <iostream>
2 #include <string>
3 using namespace std;
4 class Employee {
5 protected:
6     string Emp_name;
7     int Emp_id;
8     string Address;
9     string Mail_id;
10    string Mobile_no;
11 public:
12    Employee(const string& name, int id, const string& address,
13             const string& mail, const string& mobile)
14        : Emp_name(name), Emp_id(id), Address(address), Mail_id
15          (mail), Mobile_no(mobile) {}
16
17    virtual void generatePaySlip() = 0;
18 };
19 class Programmer : public Employee {
```

Output

Clear

```
/tmp/fiBDLUjftH.o
Pay Slip for Programmer
Employee Name: John Doe
Employee ID: 101
Address: 123 Street Ave
Mail ID: john@example.com
Mobile Number: 1234567890
Basic Pay: 50000
Dearness Allowance: 48500
House Rent Allowance: 5000
Provident Fund: 6000
Staff Club Fund: 50
Gross Salary: 103500
Net Salary: 97450
```