



**Bahria University, Islamabad**

**Department of Software Engineering**

**Computer Programming Lab**

**(Fall-2023)**

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**Lab Journal: 7**

**Date: 2 November 2023**

Task No:	Task Wise Marks		Documentation Marks		Total Marks (20)
	Assigned	Obtained	Assigned	Obtained	
1	3		5		
2	3				
3	3				
4	3				
5	3				

**Comments:**

**Signature**

## Lab No: 7- Open Ended Lab

### Task 1:

#### Code:

```
#include <iostream>

using namespace std;

int main()
{
    int x;

    cout << "Choose an option";

    cout << "\n 1) Find a prime number";

    cout << "\n 2) Specify a number";

    cin >> x;

    if (x == 1)
    {
        int range;

        cout << "Enter range: ";

        cin >> range;

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

            int isPrime = 1;

            for (int j = 2; j * j <= i; j++) {

                if (i % j == 0) {

                    isPrime = 0;

                    break;

                }

            }

        }

        if (isPrime == 1)
    {
```

```
        cout << i << " is a prime number" << endl;
    } else {
        cout << i << " is not a prime number" << endl;
    }
}
}
else if (x == 2)
{
    int n;
    cout << "Specify the number: ";
    cin >> n;

    if (n <= 1)
    {
        cout << "Prime numbers start from 2." << endl;
    }
else
{
    int isPrime = 1;

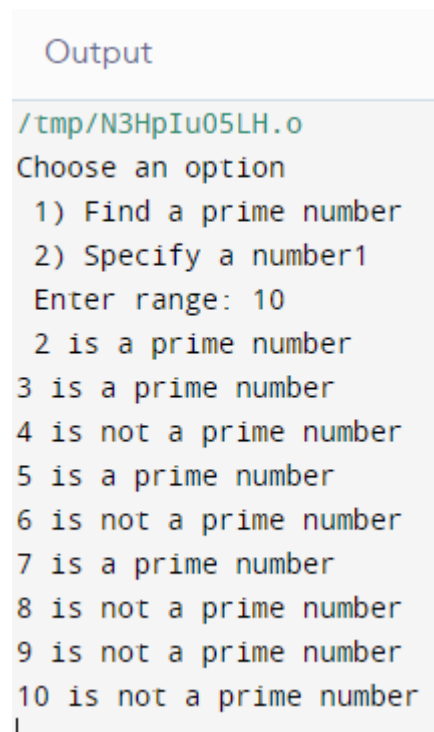
    for (int j = 2; j * j <= n; j++) {
        if (n % j == 0) {
            isPrime = 0; // Not prime
            break;
        }
    }

    if (isPrime == 1)
    {
        cout << n << " is a prime number" << endl;
    }
}
```

```
else
{
    cout << n << " is not a prime number" << endl;
}
}
} else {
    cout << "Invalid option" << endl;
}

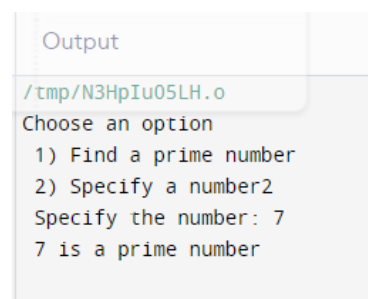
return 0;
}
```

Screenshot:



Output

```
/tmp/N3HpIu05LH.o
Choose an option
1) Find a prime number
2) Specify a number1
Enter range: 10
2 is a prime number
3 is a prime number
4 is not a prime number
5 is a prime number
6 is not a prime number
7 is a prime number
8 is not a prime number
9 is not a prime number
10 is not a prime number
|
```



Output

```
/tmp/N3HpIu05LH.o
Choose an option
1) Find a prime number
2) Specify a number2
Specify the number: 7
7 is a prime number
```

## Task 2:

### Code:

```
#include <iostream>

#include <string>

#include <ctime>

using namespace std;

struct Book {

    string title;

    string author;

    bool isBorrowed;

    time_t dueDate;

};

const int finePay = 1;

int borrowBook(Book &book) {

    if (book.isBorrowed) {

        cout << "The book is already borrowed." << endl;

    }

    else {

        book.isBorrowed = true;

        cout << "Enter due date (in days from today): ";

        int dueDays;

        cin >> dueDays;

        book.dueDate = time(nullptr) + dueDays * 24 * 60 * 60;

        cout << "Return the book by the due date." << endl;

    }

}

int returnBook(Book &book) {
```

```
    if (!book.isBorrowed) {  
        cout << "The book is not borrowed." << endl;  
    }  
    else {  
        book.isBorrowed = false;  
        cout << "Enter the number of days after the due date: ";  
        int daysLate;  
        cin >> daysLate;  
  
        if (daysLate > 0) {  
            int fineAmount = daysLate * finePay;  
            cout << "Book returned, and the fine is: $" << fineAmount << endl;  
  
            if (fineAmount > 0) {  
                cout << "Please pay the fine at the library." << endl;  
            }  
        }  
        else {  
            cout << "Book returned with no fines incurred." << endl;  
        }  
    }  
}
```

```
int main() {  
    Book myBook;  
    myBook.title = "Sample Book Title";  
    myBook.author = "Sample Author";  
    myBook.isBorrowed = false;  
    myBook.dueDate = 0;  
  
    cout << "Welcome to the Library System" << endl;
```

```
int choice;

do {
    cout << "1. Borrow a book" << endl;
    cout << "2. Return a book" << endl;
    cout << "3. Exit" << endl;
    cout << "Enter your choice: ";
    cin >> choice;

    switch (choice) {
        case 1:
            borrowBook(myBook);
            break;
        case 2:
            returnBook(myBook);
            break;
        case 3:
            cout << "Goodbye!" << endl;
            break;
        default:
            cout << "Invalid choice. Please try again." << endl;
    }
} while (choice != 3);

return 0;
}
```

Screenshot:

```
Output
/tmp/N3HpIu05LH.o
Welcome to the Library System
1. Borrow a book
2. Return a book
3. Exit
Enter your choice: 1
Enter due date (in days from today): 10
Return the book by the due date.
1. Borrow a book
2. Return a book
3. Exit
Enter your choice: 2
Enter the number of days after the due date: 23
Book returned, and the fine is: $23
Please pay the fine at the library.
1. Borrow a book
2. Return a book
3. Exit
Enter your choice: 3
Goodbye!
```

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