



NUST

NATIONAL UNIVERSITY
OF SCIENCES & TECHNOLOGY

Computer Programming Lab

Manuel5 lab tasks

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1. Convert the following while loop to a do-while loop.

```
#include<iostream>
using namespace std;
int main() {

    int x = 1;
    do {
        cout << " Enter a number:";
        cin >> x;
    } while (x > 0);

    return 0;
}
```

2. Use a do while loop to make a simple calculator for two numbers. Insert buttons for it to ask again and for termination.

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

int main() {
    char choice;

    do {
        double num1, num2;
        char operation;
        double result;
        //input
        cout << "Enter the first number: ";
        cin >> num1;

        cout << "Enter an operation (+, -, *, /): ";
        cin >> operation;

        cout << "Enter the second number: ";
        cin >> num2;

        switch (operation) {
            case '+':
                result = num1 + num2;
                break;
            case '-':
                result = num1 - num2;
                break;
            case '*':
                result = num1 * num2;
                break;
```

```

    case '/':
        if (num2 != 0) {
            result = num1 / num2;
        } else {
            cout << "Error: Division by zero!" << endl;
            // Default result in case of division by zero
        }
        break;
    default:
        cout << "Invalid operation!" << endl;
        // Default result for an invalid operation
        break;
}

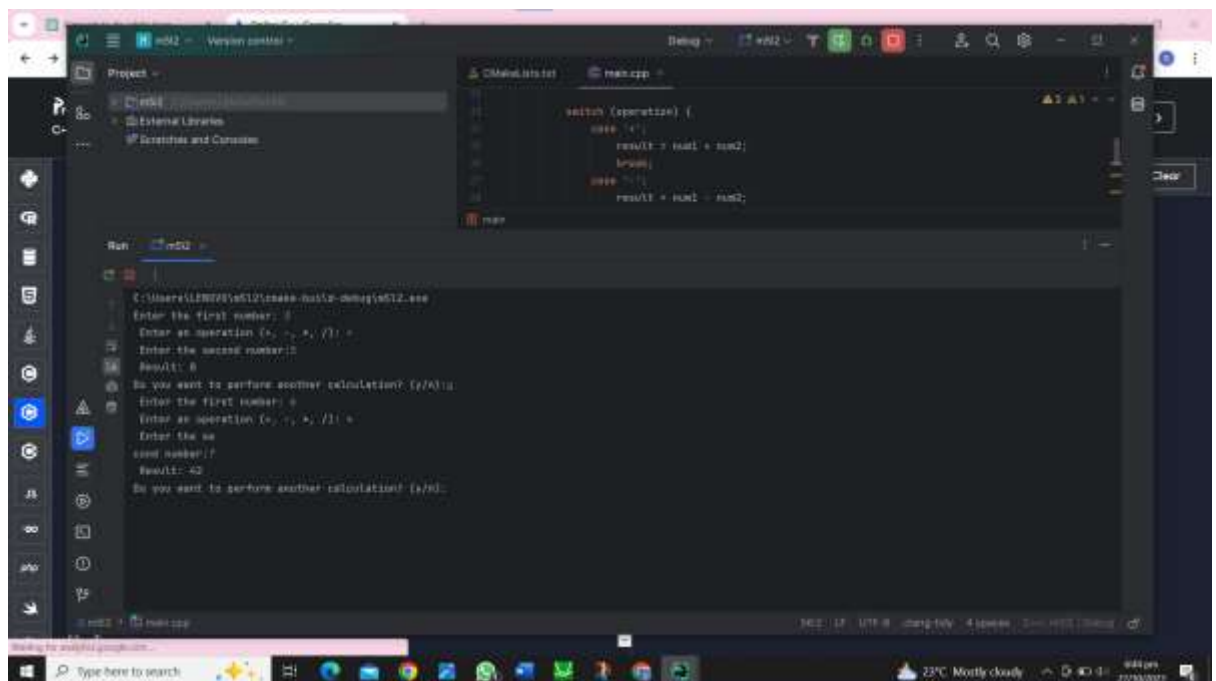
cout << "Result: " << result << endl;

cout << "Do you want to perform another calculation? (y/n): ";
cin >> choice;
} while (choice == 'y' || choice == 'Y');

cout << "Calculator terminated " << endl;

return 0;
}

```



3. Write programs with while or do while loops that compute:
- a. The sum of all even numbers between 2 and 100 (inclusive).

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
    int num = 2;
```

```
    int sum = 0;
```

```
    while (num <= 100) {
```

```
        sum += num;
```

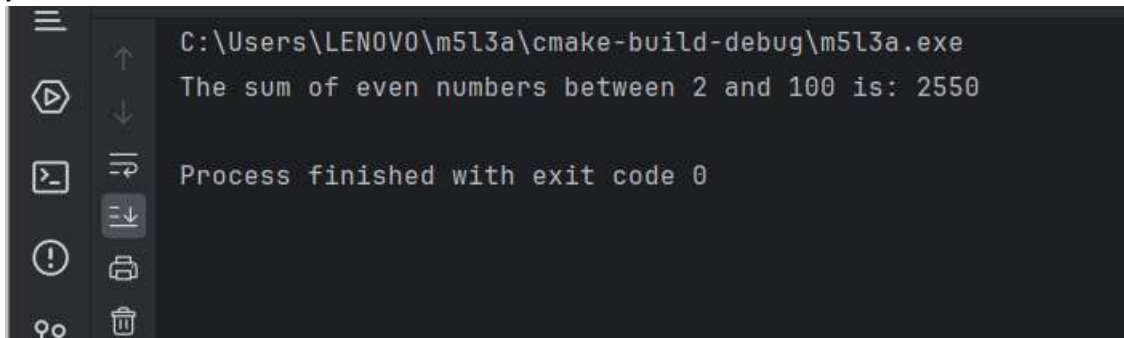
```
        num+= 2;
```

```
    }
```

```
    cout << "The sum of even numbers between 2 and 100 is: " << sum << endl;
```

```
    return 0;
```

```
}
```



```
C:\Users\LENOVO\m5l3a\cmake-build-debug\m5l3a.exe
The sum of even numbers between 2 and 100 is: 2550
Process finished with exit code 0
```

- b. The sum of all squares between 1 and 100 (inclusive).

```
#include <iostream>
```

```
using namespace std;
```

```
int main () {
```

```
    int num = 1;
```

```
    int sum = 0;
```

```
    while (num<= 100) {
```

```
        sum + = num* num;
```

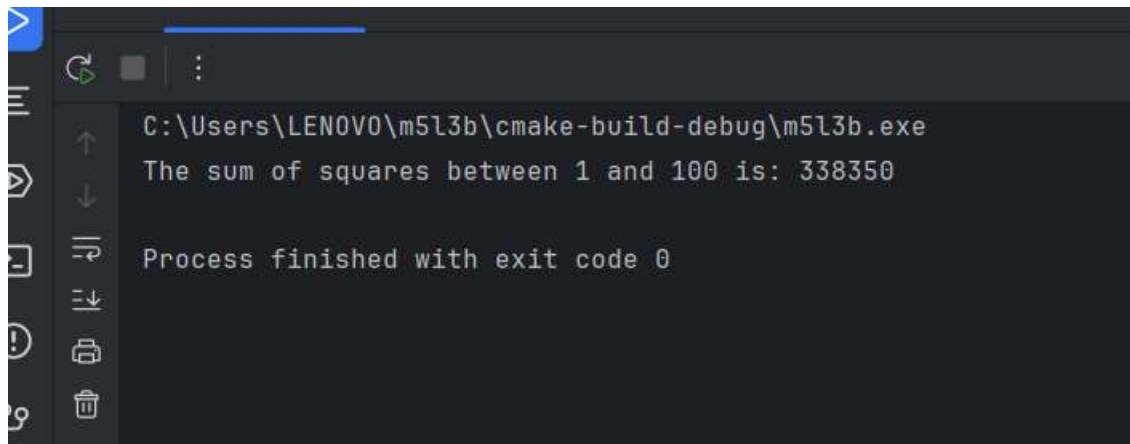
```
        num++;
```

```
    }
```

```
    cout << "The sum of squares between 1 and 100 is: " << sum << endl;
```

```
    return 0;
```

```
}
```



```
C:\Users\LENOVO\m5l3b\cmake-build-debug\m5l3b.exe
The sum of squares between 1 and 100 is: 338350

Process finished with exit code 0
```

4. Write programs with while or do while loops that compute:

a. All powers of 2 from 0 up to 20

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
    int exponent = 0;
```

```
    long long result = 1;
```

```
    while (exponent <= 20) {
```

```
        result *= 2;
```

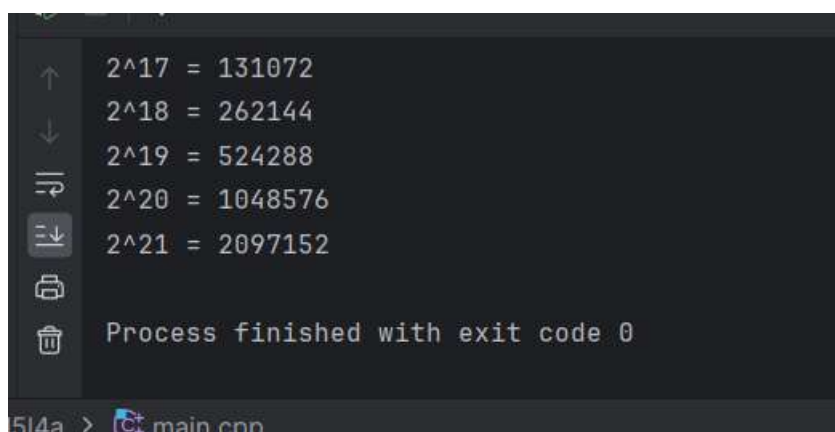
```
        exponent++;
```

```
        cout << "2^" << exponent << " = " << result << endl;
```

```
    }
```

```
    return 0;
```

```
}
```



```
2^17 = 131072
2^18 = 262144
2^19 = 524288
2^20 = 1048576
2^21 = 2097152

Process finished with exit code 0
```

5l4a > C:\main.cpp

4. B . The sum of all odd numbers between a and b (inclusive), where a and b are input

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
int a, b;
```

```
int sum = 0;
```

```
cout << "Enter the starting value (a): ";
```

```
cin >> a;
```

```
cout << "Enter the ending value (b): ";
```

```
cin >> b;
```

```
if (a > b) {
```

```
    cout << "Invalid input: a should be less than or equal to b." << endl;
```

```
    return 1;
```

```
}
```

```
while (a <= b) {
```

```
    if (a % 2 != 0) {
```

```
        sum += a;
```

```
    }
```

```
    a++;
```

```
}
```

```
cout << "The sum of all odd numbers between " << a << " and " << b << " is: " << sum << endl;
```

```
return 0;
```

```
}
```