



FUNDAMENTALS OF PROGRAMMING

LAB TASKS

ME-15-C

TASK-1

Convert the following while loop to a do-while loop:

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

```
int x = 1;

do {

    cout << "enter a number: ";

    cin >> x;

} while (x > 0);
```

TASK-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;

    float n1, n2, answer;

    do {

        cout << "Enter first number: ";

        cin >> n1;

        cout << "Enter second number: ";

        cin >> n2;

        cout << "Enter an operator (+, *, /, -): ";

        cin >> choice;
```

```

switch (choice) {
    case '+':
        answer = n1 + n2;
        break;
    case '*':
        answer = n1 * n2;
        break;
    case '/':
        answer = n1 / n2;
        break;
    case '-':
        answer = n1 - n2;
        break;
    default:
        cout << "Invalid operator";
        continue;
}

cout << "The Answer is: " << answer << endl;

cout << "Enter 'a' to perform another calculation, or 'b' to quit: ";
cin >> choice;

} while (choice != 'b');

return 0;
}

```

```

/tmp/Jz9Hn810Bg.o
Enter first number: 5
Enter second number: 9
Enter an operator (+, *, /, -): -
The Answer is: -4
Enter 'a' to perform another calculation, or 'b' to quit: b

```

TASK-3

Write programs with while or do while loops that compute:

a. The sum of all even numbers between 2 and 100 (inclusive)

<pre>1 #include <iostream> 2 using namespace std; 3 4 int main() { 5 int sum = 0; 6 int a = 2; 7 8 while (a <= 100) { 9 sum += a; 10 a += 2; 11 } 12 13 cout << "The sum of all the even numbers between 2 and 100 = " << sum << endl; 14 15 return 0; 16 }</pre>	<p>/tmp/Jz9Hn810Bg.o</p> <p>The sum of all the even numbers between 2 and 100 = 2550</p>
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b. The sum of all squares between 1 and 100 (inclusive).

<pre>1 #include <iostream> 2 using namespace std; 3 4 int main() { 5 int sum = 0; 6 int a = 1; 7 8 while (a <= 100) { 9 sum += a * a; 10 a++; 11 } 12 13 cout << "The sum of all the squares between 1 and 100 = " << sum << endl; 14 15 return 0; 16 }</pre>	<p>/tmp/Jz9Hn810Bg.o</p> <p>The sum of all the squares between 1 and 100 = 338350</p>
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TASK-4

Write programs with while or do while loops that compute:

a. All powers of 2 from 20 up to 220 .

```
1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     int a = 0;
6     int power = 1;
7
8     while (a <= 20) {
9         cout << "2^" << a << " = " << power << endl;
10        power *= 2;
11        a++;
12    }
13
14    return 0;
15 }
```

/tmp/Jz9Hn810Bg.o

2^0 = 1
2^1 = 2
2^2 = 4
2^3 = 8
2^4 = 16
2^5 = 32
2^6 = 64
2^7 = 128
2^8 = 256
2^9 = 512
2^10 = 1024
2^11 = 2048
2^12 = 4096
2^13 = 8192
2^14 = 16384
2^15 = 32768
2^16 = 65536
2^17 = 131072
2^18 = 262144
2^19 = 524288
2^20 = 1048576

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

```
1 #include <iostream>
2
3 int main() {
4     int a, b, sum = 0;
5
6     std::cout << "Enter the first number(a): ";
7     std::cin >> a;
8
9     std::cout << "Enter the second number(b): ";
10    std::cin >> b;
11
12    int i = a;
13    do {
14        if (i % 2 != 0) {
15            sum += i;
16        }
17        i++;
18    } while (i <= b);
19
20    std::cout << "The sum of all the odd numbers between " << a << " and " << b
21        << " is = " << sum << std::endl;
22
23    return 0;
24 }
```

/tmp/GSYfFzP16H.o

Enter the first number(a): 5
Enter the second number(b): 7
The sum of all the odd numbers between 5 and 7 is = 12

