

# Lab 5

## (Lab Tasks)

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Task 1:

Code:

```
1  #include <iostream>
2  using namespace std;
3
4  int main()
5  {
6
7      int x=1;
8      do
9      {
10         cout << "Enter a number: ";
11         cin >> x;
12     } while (x >= 0);
13
14     return 0;
15 }
```

Output:

```
Enter a number: 7
Enter a number: 3
Enter a number: 2
Enter a number: 3
Enter a number: 0
Enter a number: -14

-----
Process exited after 16.56 seconds with return value 0
Press any key to continue . . .
```

Task 2:

Code:

```
20 #include <iostream>
21 #include <math.h>
22 using namespace std;
23
24 int main()
25 {
26     char choice;
27     do {
28         double num1, num2;
29         char operation;
30         double result;
31
32         cout << "Enter the first number: ";
33         cin >> num1;
34
35         cout << "Enter the second number: ";
36         cin >> num2;
37         cout << "Enter an operation (+, -, *, /, %, ^): ";
38         cin >> operation;
39
40         switch (operation) {
41             case '+':
42                 result = num1 + num2;
43                 break;
44             case '-':
45                 result = num1 - num2;
46                 break;
47             case '*':
48                 result = num1 * num2;
49                 break;
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}

case '/':
    if (num2 != 0) {
        result = num1 / num2;
    } else {
        cout << "Division by zero is not allowed." << endl;
        continue; // Skip the rest of the loop and ask for input again
    }
    break;
case '%':
    result = fmod(num1, num2);
    break;
case '^':
    result = pow(num1, num2);
    break;
default:
    cout << "Invalid operation. Please use +, -, *, /, % or ^." << endl;
    continue; // Skip the rest of the loop and ask for input again
}

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

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

cout << "Calculator terminated. Have a great day!" << endl;

return 0;
}

```

Output:

```

Enter the first number: 2
Enter the second number: 6
Enter an operation (+, -, *, /, %, ^): ^
Result: 64
Do you want to perform another calculation? (y/n): n
Calculator terminated. Have a great day!

-----
Process exited after 12.91 seconds with return value 0
Press any key to continue . . .

```

Task 3a:

Code:

```
90 #include <iostream>
91
92 int main() {
93     int num = 2; // Start with the first even number
94     int sum = 0;
95
96     while (num <= 100) {
97         sum += num;
98         num += 2; // Move to the next even number
99     }
100
101     std::cout << "Sum of even numbers between 2 and 100 (inclusive): " << sum << std::endl;
102
103     return 0;
104 }
105
106
107
108
```

Output:

```
Sum of even numbers between 2 and 100 (inclusive): 2550
-----
Process exited after 0.1832 seconds with return value 0
Press any key to continue . . .
```

Task 3b:

Code:

```
112 #include <iostream>
113
114 int main() {
115     int num = 1; // Start with 1
116     int sum = 0;
117
118     do {
119         sum += num * num;
120         num++; // Move to the next number
121     } while (num <= 100);
122
123     std::cout << "Sum of squares between 1 and 100 (inclusive): " << sum << std::endl;
124
125     return 0;
126 }
127
128
129
130
131
132
```

Output:

```
Sum of squares between 1 and 100 (inclusive): 338350
-----
Process exited after 0.07449 seconds with return value 0
Press any key to continue . . .
```

Task 4a:

Code:

```
137 #include <iostream>
138
139 using namespace std;
140
141 int main() {
142     int power = 0;
143     long long result = 1; // Use a long long to handle large numbers
144
145     while (power <= 20) {
146         cout << "2^" << power << " = " << result << endl;
147         result *= 2;
148         power++;
149     }
150
151     return 0;
152 }
153
154
155
156
```

Output:

```
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

-----
Process exited after 0.07536 seconds with return value 0
Press any key to continue . . .
```

Task 4b:

Code:

```
160 #include <iostream>
161
162 using namespace std;
163
164 int main() {
165     int a, b;
166     int sum = 0;
167
168     cout << "Enter the starting number (a): ";
169     cin >> a;
170     cout << "Enter the ending number (b): ";
171     cin >> b;
172
173     if (a > b) {
174         cout << "Invalid input: 'a' should be less than or equal to 'b'." << endl;
175         return 1;
176     }
177
178     int currentNumber = a;
179
180     do {
181         if (currentNumber % 2 != 0) {
182             // Check if the number is odd
183             sum += currentNumber;
184         }
185         currentNumber++;
186     } while (currentNumber <= b);
187
188     cout << "The sum of all odd numbers between " << a << " and " << b << " is: " << sum << endl;
189
190     return 0;
191 }
192
```

Outputs:

```
Enter the starting number (a): 6
Enter the ending number (b): 4
Invalid input: 'a' should be less than or equal to 'b'.
-----
Process exited after 47.32 seconds with return value 1
Press any key to continue . . .
```



Enter the starting number (a): 2

Enter the ending number (b): 83

The sum of all odd numbers between 2 and 83 is: 1763

-----

Process exited after 10.09 seconds with return value 0

Press any key to continue . . .