

FUNDAMENTALS OF PROGRAMMING

Manual 05

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Section C

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TASK 01:

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

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

SOL:

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

TASK 02:

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

SOL:

```
#include <iostream>
using namespace std;
int main() {
    float x, y;
    char choice;
    char change;
    do {
        cout << "Enter the first number: ";
        cin >> x;
```

```
    cout << "Enter the second number: ";

    cin >> y;

cout << "Select operation:\n";

cout << "1. Addition\n";

cout << "2. Subtraction\n";

cout << "3. Multiplication\n";

cout << "4. Division\n";

cout << "Enter your choice (1-4): ";

    cin >> choice;

float result = 0;

switch (choice) {

    case '1':

        result = x + y;

        break;

    case '2':

        result = x - y;

        break;

    case '3':

        result = x * y;

        break;

    case '4':

        result = x / y;

        break;

    default:

        cout << "Error.";

        continue;

}

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

```
    cout << "Do you want to calculate with different numbers? (yes/no): ";  
    cin >> change;  
} while (change == 'y');  
return 0;  
}
```

/tmp/fUqmQGaIzn.o

Enter the first number: 8

Enter the second number: 9

Select operation:

1. Addition

2. Subtraction

3. Multiplication

4. Division

Enter your choice (1-4): 3

Result: 72

Do you want to calculate with different numbers? (yes/no): y

Enter the first number: 8

Enter the second number: 5

Select operation:

1. Addition

2. Subtraction

3. Multiplication

4. Division

Enter your choice (1-4): 3

Result: 40

Do you want to calculate with different numbers? (yes/no):

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TASK 03

Write programs with while or do while loops that compute:

- a.** The sum of all even numbers between 2 and 100 (inclusive).
- b.** The sum of all squares between 1 and 100 (inclusive).

Part A:-

```
#include <iostream>

using namespace std;

int main() {
    int sum = 0;
    int x = 2;
    while (x <= 100) {
        sum += x;
        x += 2;
    }
    cout << "The sum of all even numbers between 2 and 100 is: " << sum;
    return 0;
}
```

Output

```
/tmp/fUqmQGaIzn.o
The sum of all even numbers between 2 and 100 is: 2550
```

Part B:-

```
#include <iostream>

using namespace std;

int main() {

    int sum = 0;

    int x = 1;

    do {

        sum += x * x;

        x++;

    } while (x <= 100);

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

    return 0;

}
```

Output

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/tmp/fUqmQGaIzn.o

The sum of all squares between 1 and 100 is: 338350

TASK 04

Write programs with while or do while loops that compute:

- a. All powers of 2 from 20 up to 220 .
- b. The sum of all odd numbers between a and b (inclusive), where a and b are inputs.

SOL:

Part A:-

```
#include <iostream>

#include <math.h>

using namespace std;

int main() {

    int power = 1;

    int result = 1;

    while (power <= 20) {

        cout << "2^" << power << " = " << result << endl;

        result *= 2;

        power++;

    }

    return 0;

}
```

Output

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/tmp/fUqmQGaIzn.o

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

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Part B:-

```
#include <iostream>

using namespace std;

int main() {

    int a, b;

    int sum = 0;

    cout << "Enter the value of a: ";

    cin >> a;

    cout << "enter the value of b: ";

    cin >> b;

    while (a <= b) {

        if (a % 2 != 0) {

            sum += a;

        }

        a++;

    }

    cout << "The sum of all odd numbers is: " << sum << endl;

    return 0;

}
```

Output[Clear](#)

/tmp/fUqmQGaIzn.o

Enter the value of a: 34

enter the value of b: 45

The sum of all odd numbers is: 240