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: ";</pre>
     cin >> y;
cout << "Select operation:\n";</pre>
cout << "1. Addition\n";</pre>
cout << "2. Subtraction\n";</pre>
cout << "3. Multiplication\n";</pre>
cout << "4. Division\n";</pre>
cout << "Enter your choice (1-4): ";</pre>
     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;</pre>
```

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

```
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 Activate Windows

Do you want to calculate with different numbers? (yes/no) activate Windows.
Result: 40
```

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:-

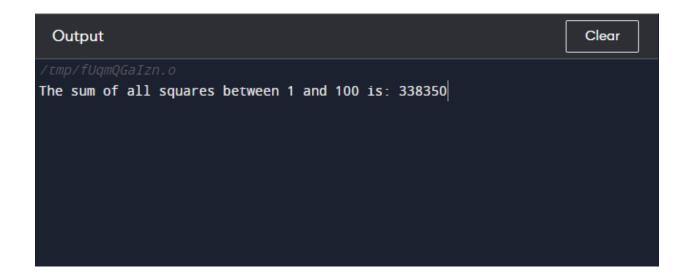
```
#include <iostream>
using namespace std;
int main() {
   int sum = 0;
   int x = 2;
   while (x <= 100) {
      sum += x;
      x += 2;
   }
cout << "The sum of all even numbers between 2 and 100 is: " << sum;
   return 0;
}</pre>
```

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;
}</pre>
```



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;
}</pre>
```

```
Output Clear

/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

Activate Windows

Go to Settings to activate Windows
```

```
Part B:-
#include <iostream>
using namespace std;
int main() {
  int a, b;
  int sum = 0;
cout << "Enter the value of a: ";</pre>
  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;</pre>
```

return 0;

}

```
Output

/tmp/fUqmQGaIzn.o

Enter the value of a: 34
enter the value of b: 45
The sum of all odd numbers is: 240
```