**Q1**

* In a counter-controlled while loop it's not necessary to initialize the loop control variable (**false**)
* it is pissible that the body of a while loop may not execute at all (**true**)
* In an infinite while loop, the while expression (the decision maker) is initially false, but after the first iteration it is always true (**true**)
* The while loop: terminates if j > 10 (**true**)

j = 0;

while (j <= 10)

j++

* A sentinel-controlled while loop is an event-controlled while loop whose termination depends on a special value (**true**)
* A loop is a control structure that causes certain statements to execute over and over (**true**)

**Q2**

* What is the output of the following C++ code ?

#include <iostream>

using *namespace* std;

*void* main() {

*int* i = 0;

*int* temp = 1;

while (i < 5) {

i = i + 1;

temp = temp \* i;

}

cout << "i = " << i << " and temp = " << temp << endl;

}

**Answer:**

Error, the main cannot return **void**, it must return **int**

* Suppose that the input is **10 30 16 25 76 -1.** What is the output of the following code?

#include <iostream>

using *namespace* std;

*int* main(){

*// inputs are 10 30 16 25 76 -1*

*int* num = 0;

*int* sum;

*int* count = 0;

cin >> sum; *// 10*

while (count < 3){

cin >> num; *// 30, 16, 25,*

sum = sum + num; *// 40, 56, 81*

count++; *// 1, 2, 3*

}

cout << "Sum = " << sum << endl; *// 81*

}

**Answer:**

Sum = 81

* Suppose that the input is **25 36 18 16 -1.** What is the output of the following code?

#include <iostream>

using *namespace* std;

*int* main(){

*// input are 25 36 18 16 -1*

*int* num;

*int* sum;

cin >> sum; *// 25*

num = sum;

while (num != -1){

cin >> num; *// 36, 18, 16, -1*

sum = sum + num; *// 61, 79, 95, 94*

}

cout << "Sum = " << sum << endl; *// 94*

}

**Answer:**

Sum = 94

* Suppose that the input is **25 36 18 16 -1.** What is the output of the following code?

#include <iostream>

using *namespace* std;

*int* main() {

*// input are 25 36 18 16 -1*

*int* num;

*int* sum;

cin >> num; *// 25*

sum = num; *// 25*

while (num != -1) {

sum = sum + num; *//50, 86, 104, 120,*

cin >> num; *// 36, 18, 16, -1*

}

cout << "Sum = " << sum << endl; *// 120*

}

**Answer:**

Sum = 120

* Suppose that the input is **10 -6 12 -5 -4 0**. What is the outptut of the following code?

**Answer:**

#include <iostream>

using *namespace* std;

*int* main() {

*// input are 10 -6 12 -5 -4 0*

*int* num;

*int* sum = 0;

cin >> num; *// 10*

while (num != 0) {

if (num > 0)

sum = sum + num;

else

sum = sum - num;

*// sum: 10, 16, 28, 33, 37*

cin >> num; *// -6, 12, -5, -4, 0*

}

cout << "Sum = " << sum << endl; *// 37*

}

* Correct the following code so that it reads and finds the sum of 20 numbers

#include <iostream>

using *namespace* std;

*int* main(){

*int* count = 0;

*int* sum = 0;

cin >> num;

while(count <= 20);

{

cin >> num;

count++;

sum = sum + count;

}

}

**Answer:**

#include <iostream>

using *namespace* std;

*int* main() {

*int* count = 1;

*int* sum = 0;

*int* num;

while (count <= 20) {

cin >> num;

sum += num;

count++;

}

cout << sum << endl;

}

**9. Consider the following for loop:**

*int* j, s;

s = 0;

for (j = 1; j <= 10; j++)

s = s + j \* (j - 1);

**Answer ?**

**s** is a sum of the loop

it will be **330** once done

**10. What is the ouput of the following program segment?**

*int* num = 1;

*int* i;

for (i = 0; i < 5; i++){

num = num \* (5 - i);

cout << num << " ";

}

cout << endl;

**Answer**

**5 20 60 120 120**

**11. Assume that the following code is correctly inserted into a program**

*int* s = 0;

*int* i;

for(i = 0; i < 5; i++)

{

s = 2 \* s + i;

cout << s << " ";

}

* + - * What is the final value of s?
        + 11
        + 4
        + 26
        + none of these
      * if a semicolon is inserted after the right parenthesis in the for loop statement, what is the final value of s?
        + 0
        + 1
        + 2
        + 5
        + none of these
      * if the 5 is replaced with a 0 in the for loop conteol expression, what is the final value of s?
        + 0
        + 1
        + 2
        + none of these

**Answer**

* **26**
* **5**
* **0**

**13. Write a for loop statement to add all the miltiples of 3 between 3 and 100**

**Answer**

#include <iostream>

using *namespace* std;

*int* main() {

*int* sum = 0;

for (*int* i = 3; i <= 100; i += 3)

sum += i;

}

**30. What is the output of the following program segment?**

*int* count;

*int* y = 0;

for (count = 1; count <= 5; ++count){

num = 3 \* (count - 1) + ( y - count );

cout << num << " ";

}

cout << count << " " << endl;

**Answer**

num is not defined

**32. Suppose that the input is 5 3 8. What is the output of the following code? Assume all variables are properly declared**

cin >> a >> b >> c;

for (j = 1; j < a; j++){

d = b + c;

b = c;

c = d;

cout << c << " ";

}

cout << endl;

**Answer**

11 19 30 49

**34. Suppose that the input is 3 5 7 -6 10. What is the output of the following code?**

*int* temp = 0;

*int* num;

*int* count;

cin >> temp;

for (count = 0; count <= 3; count ++)

{

cout << temp << " ";

cin >> num;

temp = temp + num \* (count - 1);

}

cout << endl;

**Answer**

3 -2 -2 -8

**35. The following program contains errors that prevents it from compiling and / or running. Correct all such errors.**

#include <iostream>

using *namespace* sdt;

*const* *int* SECRET = 111.25;

*int* main()

{

*int* num1, num2:

*double* x, y;

cout >> "Enter two integers: ""

cin << num1 << num2

cout >> endl;

for (count = 1 count > Secret; ++count)

{

x = (num1 + num2) / 2.0;

y = (num1 - num2) % 2.0;

num1: = num1 + num2;

num2: = num2 + (count - SECRET - 1)

}

cout << num1 << " " << num2 << " << x % 5

<< " " << (y % 7) << end;

return;

}

**Answer**

#include <iostream>

using *namespace* std;

*const* *double* SECRET = 111.25;

*int* main()

{

*int* num1, num2,count;

*double* x, y;

cout << "Enter two integers: ";

cin >> num1 >> num2;

cout << endl;

for (count = 1; count > SECRET; ++count)

{

x = (num1 + num2) / 2.0;

y = (num1 - num2) % 2;

num1 = num1 + num2;

num2 = num2 + (count - SECRET - 1);

}

cout << num1 << " " << num2 << " " << *int*(x) % 5

<< " " << (*int*(y) % 7) << endl;

return 0;

}

**Q:Do these programming exercises with c++ language:**

**6. Write a program that prints prime number in the range from the user**

**Answer**

#include <iostream>

using *namespace* std;

*bool* isPrime(*int* *num*) {

if (*num* <= 1)

return false; *// 0 and 1 are not prime*

for (*int* i = 2; i \* i <= *num*; i++) {

if (*num* % i == 0)

return false;

}

return true;

}

*int* main() {

*int* start, end;

cout << "Enter the start of the range: ";

cin >> start;

cout << "Enter the end of the range: ";

cin >> end;

cout << "Prime numbers between " << start << " and " << end << " are:\n";

for (*int* num = start; num <= end; num++) {

if (isPrime(num)) {

cout << num << " ";

}

}

cout << endl;

return 0;

}

**8. Write a program to print the smallest number in a group of numbers enterd in the range that the user choices without using an array, so it with a for loop and while loop and**

**a do while loop**

#include <iostream>

using *namespace* std;

*void* main\_operation(*bool&* *at\_the\_start*, *int&* *min*, *int&* *i*) {

*int* current\_value;

cout << "Enter the " << *i* << " number: ";

cin >> current\_value;

if (*at\_the\_start*) {

*min* = current\_value;

*at\_the\_start* = false;

}

else if (current\_value < *min*) {

*min* = current\_value;

}

*i*++;

}

*int* get\_count() {

*int* count;

cout << "How much times would be entering number: ";

cin >> count;

return count;

}

*int* with\_for\_loop() {

*I nt* count = get\_count();

*int* min;

*bool* at\_the\_start = true;

for (*int* i = 1; i <= count;) {

main\_operation(at\_the\_start, min, i);

}

return min;

}

*int* with\_while\_loop() {

*int* count = get\_count();

*int* min;

*int* i = 1;

*bool* at\_the\_start = true;

while (count >= i) {

main\_operation(at\_the\_start, min, i);

}

return min;

}

*int* with\_do\_while\_loop() {

*int* count = get\_count();

*int* min;

*int* i = 1;

*bool* at\_the\_start = true;

do {

main\_operation(at\_the\_start, min, i);

} while (count >= i);

return min;

}

*int* main() {

*int* min = with\_do\_while\_loop();

cout << "The smallest number: " << min << endl;

}

**14. Write a C++ program that uses while statement and the tab escape sequence \t to print the following table of values then rewrite the program using loops [for - do while – goto]**

#include <iostream>

#include <math.h>

using *namespace* std;

*void* with\_for\_loop() {

cout << "N\t10\*N\t100\*N\t1000\*N" << endl;

for (*int* i = 1; i <= 5; i++) {

cout << i << "\t";

for (*int* j = 1; j <= 3; j++) {

cout << i \* (pow(10, j)) << "\t";

}

cout << endl;

}

}

*void* with\_while\_loop() {

*int* i = 1;

*int* j = 1;

cout << "N\t10\*N\t100\*N\t1000\*N" << endl;

while (i <= 5) {

j = 1;

while (j <= 4) {

cout << i \* (pow(10, j)) << "\t";

j++;

}

i++;

cout << endl;

}

}

*void* with\_do\_while\_loop() {

*int* i = 1;

*int* j = 1;

cout << "N\t10\*N\t100\*N\t1000\*N" << endl;

do {

j = 1;

do {

cout << i \* (pow(10, j)) << "\t";

j++;

} while (j <= 4);

i++;

cout << endl;

} while (i <= 5);

}

*void* with\_goto() {

cout << "N\t10\*N\t100\*N\t1000\*N" << endl;

*int* i = 1;

rows\_label:

if (i > 5)

return;

cout << i << "\t";

*int* j = 1;

columns\_label:

if (j >= 4){

i++;

cout << endl;

goto rows\_label;

}

cout << i \* (pow(10, j)) << "\t";

j++;

goto columns\_label;

}

*int* main() {

with\_goto();

}