27. Given Program 3.8. Study the program carefully, then compile and execute it.

1. //Program 3.8

2.#include <iostream>

3.using namespace std;

4.

5.int main() {

6. int N, weightCnt = 0;

7. double weight, totWeight = 0;

8. cout << “Calculate the Average and Total Weight “;

9. cout << “ of Students\n\n”;

10. cout << “How many students do you have?”;

11. cin >> N;

12.

13. do

14. {

15. cout << “Enter the weight of a student : “;

16. cin >> weight;

17. totWeight += weight;

18. weightCnt ++;

19. }

20. while (weightCnt < N);

21.

22. cout << “\n\nYou have “ << weightCnt << “weights.”;

23. cout << “\nThe Average Weight: “ << (totWeight / weightcnt);

24. cout << “\nThe Total Weight : “ << totWeight;

25. cout << “\n\nEnd of Program”;

26. return 0;

27. }

a. What type of loop is used in Program 3.8, and how does it differ from Program 3.7?

do..while loop. Program 3.7 is a while-do loop

b. What is the purpose of variable *N* in this program?

To control the flow of loop by setting a number

c. Why do you need variable weightCnt in this program, and why it is initialized to 0?

Variable weightCnt is used to check the loop will be executed or not. When loop is executed, it will increase from 0,1,2 and so on.

d. Replace while (weightCnt > N) with the following statement, and state it is effect to the program?

i. while (--N) Nothing change

ii. while (N--) change. Number of weight needed to enter is 6 times and average weight counted is 6 people.

28. Given Program 3.9. Study the program carefully, then compile and execute it.

1.//Program 3.9

2.#include <iostream>

3. using namespace std;

4.

5. int main () {

6. int mark;

7. do

8. {

9. cout << “\nEnter marks for test 1: “;

10. cin >> mark;

11. } while ((mark <0) || (mark > 100));

12.

13. cout << “\nYour mark for test1 is “ << mark;

14. cout << “\n\nEnd of Program”;

15. return 0;

16. }

a. What does the program do?

Request user to insert a number from 0 to 100 and the program will be executed when the number input is outside the range of 0-100

b. We need ONE value for this *mark* in this program. Why do we need the value in the *do..while* loop?

If the value is outside the range, then the program will continue run till the value entered is inside the range

c. What is a valid value for mark?

0-100

d. What can be deduced about the number of iterations done in a *do..while* loop compared to a *while* loop?

In Do..while loop , loop will be executed if the condition is false but in while loop , loop will never be executed.

e. Modify Program 3.9 such that the proper data validation is implemented using the *do..while* loop.

29. The purpose of a loop control structure is for repititions. As an aside it can also be used for data or input validation. Modify Program 3.9 (rename it as Program 3.9b) so that apart from the validation for mark, it is able to respectively ask the user to key in values for several test marks and print them out accordingly (for example, iteration 1 prints Test 1 mark, iteration 2 prints Test 2 mark and iteration 3 prints Test 3 mark).

30. Write a *for* loop that displays all the even numbers between -10 and 10.

Int main() {

int n;

for ( n=-10; n < 10; n+=2)

 cout << n <<endl;

}

31. Write a *for* loop that displays every fifth number, from 50 to 100.

int n;

for (n=50; n<=100; n+=5)

32. Given Program 3.10. Study the program carefully, the compile and execute it.

1. //Program 3.10

2.#include <iostream>

3.using namespace std;

4.

5.int main () {

6. double weight, totWeight = 0;

7. cout cout << “Calculate the Average and Total Weight”;

8. cout << “ of Students\n\n”;

9. for (int s\_Num = 0; s\_Num < 5; s\_Num++)

10. {

11. cout << “Enter the weight of a student : “;

12. cin >> weight;

13. totWeight += weight;

14. }

15.

16. cout << “\nThe Average Weight: “ << (totWeight / s\_Num);

17. cout << “\nThe Total Weight : “ << totWeight;

18. cout << “\n\nEnd of Program”;

19. return 0;

20. }

a. What does the program do? In what way is this program different from Program 3.7?

request user to enter 5 weight of students and program will calculate total and average weight. Program 3.10 is for loop but Program 3.7 is do..while loop

b. Identify the body of the loop, and state how many times it is repeated.

For loop, 5 times.

c. Why do we now need only one variable to hold the weights of the students.

To calculate the average and total weight of 5 students

d. Change the statement for (int s\_Numv = 0; s\_Num < 5; s\_Num++) at line 9 to the following statement. State whether the ouput of the program remains the same, or if the output changes, what are the changes?

i. for (int s\_Num=0; s\_Num<=5; s\_Num++)

The loop repeated 6 times and the average and total weight calculated is also 6 students.

ii. for (int s\_Num=0; s\_Num<25; s\_Num+=5)

output remains the same

iii. for (int s\_Num=10; s\_Num<15; s\_Num++)

output remains the same

iv. for (int s\_Num=5; s\_Num>0; s\_Num--)

output remains the same

e. Modify the program such that it will calculate and print the average and the total weights of 20 students.

1. //Program 3.10

2.#include <iostream>

3.using namespace std;

4.

5.int main () {

6. double weight, totWeight = 0;

7. int num = 20

8. cout cout << “Calculate the Average and Total Weight”;

9. cout << “ of Students\n\n”;

10. for (int s\_Num = 0; s\_Num < 5; s\_Num++)

11. {

12. cout << “Enter the weight of a student : “;

13. cin >> weight;

14. totWeight += weight;

15. }

16.

17. cout << “\nThe Average Weight: “ << (totWeight / s\_Num);

18. cout << “\nThe Total Weight : “ << totWeight;

19. cout << “\n\nEnd of Program”;

20. return 0;

21. }

34. Convert the following for loop statement to while loop statement, and then to a do..while loop statement.

1. int total = 0;

2. for (int count = 0; count <=30; count++)

3. {

4. total +=count;

5. }

1. int total = 0,int count = 0;

2. while (count <=30;)

3. {

4. total +=count;

5. count++;

6. }

1. int total = 0,int count = 0;

2. do

3. {

4. total +=count;

5. count++;

6. }

7. while (count <=30);

35. Convert the following *while* loop statement to *for* loop statement.

1. int sen = 1; int ringgit = 0;

2. while (sen < 100)

3. {

4. ringgit += sen;

5. sen++

6. }

1. int ringgit = 0;

2. for (int sen 1; sen < 100; sen ++)

3. {

4. ringgit += sen;

5. }

36. Convert the following while loop statement to a do..while loop statement.

1. bool nonstop = true;

2. int num, total = 0

3. cin >> num;

4. while (nonstop == true )

5. { if ((num%2) == 0)

6. {

7. total += num;

8. cin >> num;

9. }

10 else

11. nonstop = false;

12. }

1. bool nonstop = true;

2. int num, total = 0

3. cin >> num;

4. do

5. { if ((num%2) == 0)

6. {

7. total += num;

8. cin >> num;

9. }

10 else

11. nonstop = false;

12. } while (nonstop == true )

38. Modify Program 3.12 such that it will produce the following output using individual loops(3 loops) as follows. Is this a good way of writing the program? Give your comments.

4 8 12 16 20 24 28 32 36

5 10 15 20 25 30 35 40 45

12 18 24 30 36 42 48 54

1. // Program 3.12

2. #include <iostream>

3. #include <iomanip>

4. using namespace std;

5.

6. int main(){

7.

8. for(int i = 1; i<10; i++)

9. cout << setw(4) << i\*4;

10. cout << endl;

11.

12. for(int i = 1; i<10; i++)

13. cout << setw(4) << i\*5;

14. cout << endl;

15.

16. for(int i = 2; i<10; i++)

17. cout << setw(4) << i\*6;

18. cout << endl;

19.

20. return 0;

21. }

Its not a good way because has many individual loops can be simplified

39. Given Program 3.13. Study the program carefully, then type, compile and execute it.

1. //Program 3.13

2. #include <iostream>

3. #include <iomanip>

4. using namespace std;

5.

6. int main () {

7. cout << “\n\t Multiplication Tables”;

8. cout << “\n\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n\n”;

9. //Print multiplication table for 1 to 2

10. for (int n=1;n <=2; n++)

11. {

12. for (int j =1; j <= 10; j++)

13. {

14. cout << setw(4) << j \* 1;

15. }

16. cout << endl;

17. }

18. cout << “\nEnd of Program”;

19. return 0;

20. }

a. What is the output of the program?

 Multiplication Tables

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 1 2 3 4 5 6 7 8 9 10

 1 2 3 4 5 6 7 8 9 10

b. Program 3.13 is supposed to produce the same output as Program 3.12, but the output is different. Identify the problem and fix it.

c. Identify the outer loop. How many times will the body of the outer loop execute? What does each outer loop represent? Which exact code determine the number of times the outer loop will execute?

“for (int n = 1; n<=2; n++)”,2 times, represent base number of multiplication table. “n <=2”.

d. Identify the inner loop. How many times will the body of the inner loop execute? What does each inner loop represent? Which exact code determine the number of times the inner loop will execute?

“for (int j = 1; j<=10; j++)”,10 times, multiplication factor of multiplication table. “j <=10”

41. Given Program 3.14.Study the program carefully, then type, compile and execute it.

1. //Program 3.14

2.#include <iostream>

3.#include <iomanip>

4.using namespace std;

5.

6. int main () {

7. int j;

8. cout << “\n\t Multiplication Tables”;

9. cout << “\n\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n\n”;

10. //Print multiplication table for 1 to 10

11. for (int n = 1; n <=10; n++)

12. {

13. j = 1;

14. while (j <=10)

15. {

16. cout << setw(4) << j \* n;

17. j++;

18. }

19. cout << endl;

20. }

21.

22. cout << “\End of Program”;

23. return 0;

24. }

a. Look at variable j at line 13. What role does variable j play in the for loop, and why is it set to 1?

Control the loop to make sure the program is executed or not. Play the eole as multiplication factor

b. Look at variable j at line 17. What role does variable j play in the while loop, and why it is incremented with 1?

Inrementation of multiplication factor, multiplication factor increase from 1,2,3 until 10

42. Modify Program 3.14 to implement the following:

a. Use a for loop for the outer loop; and a do..while loop for the inner loop.

1. //Program 3.14

2.#include <iostream>

3.#include <iomanip>

4.using namespace std;

5.

6. int main () {

7. int j, int n = 1;

8. cout << “\n\t Multiplication Tables”;

9. cout << “\n\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n\n”;

10. //Print multiplication table for 1 to 10

11. for (int n = 1; n<=10; n++)

12. {

13. int j = 1;

14. do

15. {

16. cout << setw(4) << j \* n;

17. j++;

18. } while (j <=10)

19. cout << endl;

20. }

21.

22. cout << “\End of Program”;

23. return 0;

24. }

b. Use a while loop for the outer loop; and a for loop for the inner loop.

1. //Program 3.14

2.#include <iostream>

3.#include <iomanip>

4.using namespace std;

5.

6. int main () {

7. int j;

8. cout << “\n\t Multiplication Tables”;

9. cout << “\n\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n\n”;

10. //Print multiplication table for 1 to 10

11. for (int n = 1; n <=10; n++)

12. {

13. j = 1;

14. for (int j = 1;j <=10,j++)

15. {

16. cout << setw(4) << j \* n;

17.

18. }

19. cout << endl;

20. }

21.

22. cout << “\End of Program”;

23. return 0;

24. }

43. Write the program segments utilizing nested loop concept to produce the following pattern:

a. b.

1 4321

12 432

123 43

1234 4

a.

#include <iostream>

using namespace std;

int main(){

 for(int i = 1; i<=4; i++){

 for(int j = 1; j<=i; j++)

 cout << j;

 cout << endl;

 }

 return 0;

}

b.

#include <iostream>

using namespace std;

int main(){

 for(int i = 1; i<=4; i++){

 for(int j = 4; j>=i; j--)

 cout << j;

 cout << endl;

 }

 return 0;

}

44.Given Program 3.15. Study the program carefully, then type, compile and execute it. Determine the output.

1. //Program 3.15

2.#include <iostream>

3.using namespace std;

4.

5.int main () {

6. for (int row = 0; row < 5; row++)

7. {

8. for (int hash = 0; hash < 10;hash++)

9. {

10. cout << ‘#’;

11. if (hash == 5)

12. break;

13. }

14. cout << endl;

15. }

16. return 0;

17. }

######

######

######

######

######

45. Given Program 3.16. Study the program carefully, the type, compile and execute it.

1.//Program 3.16

2.#include <iostream>

3.using namespace std;

4.

5. int main () {

6. int test = 0;

7. while (test ++ < 10)

8. {

9. if (test == 4)

10. continue;

11. cout << test << “ “ ;

12. }

13. return 0;

14.}

a. 1 2 3 5 6 7 8 9 10

b

1 2 3 5 6 7 9 10

c

4 5 6 7 8 9 10

d.

1 2 3 4 9 10