GROUP ASSIGNMENT 1

13. Given Program 3.2, study the code and run the program

1. //Program 3.2

2. #include <iostream>

3. using namespace std;

4.

5. int main () {

6. double weight;

7.

8. cout <<”Enter your body weight >>”;

9. cin >> weight;

10.

11. if (weight > 110)

12. cout << “ You are overweight!” << endl;

13. if (weight <= 110)

14. cout << “ You are OK.” << endl;

15. cout << “Try to maintain normal weight.” << endl;

16. getch();

17. return 0;

18. }

a. Explain the function or objective of the program. Draw the flowchart

Start

Read weight

False

Weight > 110

True

You are overweight!

Try to maintain normal weight.

End

b. Change the usage of the two *if* statements (line 11 and 13) to an *if … else* statement.

c. Show the difference between the usage of the two *if* statements and the *if … else* statement using a flowchart.

Start

Read weight

False

You are OK.

Weight > 110

True

You are overweight!

Try to maintain normal weight.

End

14. Rewrite the following conditional expressions as if … else statements:

a. largest = first >= second ? first : second;

If (largest = first >= second)

 first;

else

 second;

b. cout << ((minute<0) && (minute>59) ? “Sorry, invalid” : “OK, valid” ;

If ((minute < 0) && (minute > 59))

 cout >> “Sorry, invalid”;

else

 cout >> “OK, valid”;

15. Rewrite the following if … else statements as conditional expressions:

a. if (application\_status == 1)

 { cout << “ Congratulations! \n”;

 cout << “ Report for duty on the 1st. \n”; }

 Else

 cout << “ Sorry, you are not qualified.”;

cout << (application\_status == 1) ? Congratulations! Report for duty on the 1st. : Sorry, you are not qualified.;

b. if (val % 2 == 0)

 { even++;

 If (val > 10)

 val = val + 5;

 else

 val = val – 3; }

 else

 odd++;

( val % 2 == 0 )

16. Given Program 3.3, study the code and run the program.

1. //Program 3.3

2. #include <iostream>

3. using namespace std;

4.

5. int main () {

6. int filing\_status;

7.

8. cout << “Enter your tax filing status: “;

9. cin >> filing\_status;

10.

11. if (filing\_status == 1)

12. cout << “Single” << endl;

13. if (filing\_status == 2)

14. cout << “Married – filing jointly” << endl;

15. if (filing\_status == 3)

16. cout << “Married – filing separately” << endl;

17. if (filing\_status == 4)

18. cout << “Head of household” << endl;

19. if (filing\_status < 0)

20. cout << “Error in filing status” << endl;

21. if (filing\_status > 4)

22. cout << “Error in filing status” << endl;

23. return 0;

24. }

a. Determine the output.

b. Rewrite the program using *if … else … if.*

1. //Program 3.3

2. #include <iostream>

3. using namespace std;

4.

5. int main () {

6. int filing\_status;

7.

8. cout << “Enter your tax filing status: “;

9. cin >> filing\_status;

10.

11. if (filing\_status == 1)

12. cout << “Single” << endl;

13. else if (filing\_status == 2)

14. cout << “Married – filing jointly” << endl;

15. else if (filing\_status == 3)

16. cout << “Married – filing separately” << endl;

17. else if(filing\_status == 4)

18. cout << “Head of household” << endl;

19. else if (filing\_status < 0)

20. cout << “Error in filing status” << endl;

21. else if (filing\_status > 4)

22. cout << “Error in filing status” << endl;

23. return 0;

24. }

17. Given Program 3.4. Study the code and run the program.

1. //Program 3.4

2. #include <iostream>

3. using namespace std;

4.

5. int main () {

6. double mark;

7.

8. cout << “Enter your mark >> “;

9. cin >> mark;

10.

11. if (mark >=75)

12. cout << “Your score: A” << endl ;

13. else if ((mark < 75) && (mark >= 60))

14. cout << “Your score: B” << endl ;

15. else if ((mark < 60) && (mark >= 45))

16. cout << “Your score: C” << endl ;

17. else if ((mark < 45) && (mark >= 30))

18. cout << “Your score: D” << endl ;

19. else if (mark < 30)

20. cout << “Your score: E” << endl ;

21. return 0;

22. }

a. Draw a flowchart for the program.

start

Read mark

False

True

mark >= 75

False

mark <75 && mark >=60

Print “Your score: A”

True

mark <60 && mark >=45

False

Print “Your score: B”

True

Print “Your score: C”

False

mark <45 && mark >=30

True

Print “Your score: D”

mark <30

Print “Your score: E”

End

b. Given the input mark=90.6, identify which *if* statement will be evaluated and state the results of the evaluated expression.

if (mark >=75)

cout << “Your score: A” << endl ;

Result is “Your score : A”

c. Explain the difference between the *if* statement in Program 3.3 with the *if .. else .. if* statement in Program 3.4.

If statement in Program 3.3 allows the program to have more than one path of execution, instead

of Program 3.4.

18. Write nested if statements that perform the following test:

If the variable employed is equal to ‘Y’ and if salary is equal or greater than 5000, then display the message “Your housing loan application is accepted”. However, if salary is less than 5000, the display the message “Please provide a guarantor”. Otherwise, if the variable employed is equal to ‘N’, then display the message “ Your housing loan application is rejected”.

If (employed=’Y’) {

If (salary >= 5000)

 cout << “Your housing loan application is accepted”;

 else (salary < 5000)

 cout << “Please provide a guarantor”;

}

else (employed=’N’)

 cout << “ Your housing loan application is rejected”;

Draw the flowchart

start

Read

employed

True

False

employed=’Y’

Read salary

False

Employed=”N”

salary >= 5000

True

False

True

Print “Your housing loan application is rejected”

Print “Your housing loan application is accepted”

Print “Please provide a guarantor”

end

19. Refer to Program 3.3 in Question 16, rewrite the program using the switch statement.

1. //Program 3.3

2. #include <iostream>

3. using namespace std;

4.

5. int main () {

6. int filing\_status;

7. cout << “Enter your tax filing status: “;

8. cin >> filing\_status;

9.

10. switch (filing\_status)

11. {

12. case 1: cout << “Single” << endl;

13. break;

14. case 2: cout << ”Married – filing jointly” << endl;

15. break;

16. case 3: cout << “Married – filing separately” << endl;

17. break;

18. case 4: cout << “Head of household” << endl;

19. break;

20. default: cout << “Error in filing status” << endl;

21. }

22. return 0;

23. }

20. Given a selection control structure with switch in Program 3.5:

1.//Program 3.5

2.#include <iostream>

3. using namespace std;

4.

5.int main () {

6. int choice;

7.

8. cout <<”What is your favourite colour?” << endl ;

9. cout << “Enter 1 for White” << endl ;

10. cout << “Enter 2 for Blue” << endl ;

11. cout << “Enter 3 for Yellow” << endl ;

12. cout << “Enter 4 for Green” << endl ;

13. cout << “Enter your choice: “ << endl ;

14. cin >> choice ;

15.

16. switch (choice) {

17. case 1: cout << “White. You have a pure heart” << endl ;

18. break;

19. case 2: cout << “Blue. Like the sky!” << endl;

20. break;

21. case 3: cout << “Yellow. Cheerful always.” << endl ;

22. break;

23. case 4: cout << “Green. A mix of blue and yellow.” << endl ;

24. break;

25. default : cout << “I cant find that. “ << endl;

26. cout << “Thanks for playing with me!” << endl; }

27. return 0;

28. }

a. Draw a flowchart for the program.

Start

Print “What is your favourite colour?”

Print “Enter 1 for White”

Print “Enter 2 for Blue”

Print “Enter 3 for Yellow”

Print “Enter 4 for Green”

Read choice

choice==1

False

False

True

choice == 2

Print“White. You have a pure heart”

False

True

choice == 3

False

True

Print “Blue. Like the sky!”

choice == 4

True

Print “Yellow. Cheerful always.”

Print “Green. A mix of blue and yellow.”

Print “I cant find that. “

Print “Thanks for playing with me!”

End

b. Based on the flowchart, rewrite Program 3.5 using the if..else..if selection control structure.

1.//Program 3.5

2.#include <iostream>

3. using namespace std;

4.

5.int main () {

6. int choice;

7.

8. cout <<”What is your favourite colour?” << endl ;

9. cout << “Enter 1 for White” << endl ;

10. cout << “Enter 2 for Blue” << endl ;

11. cout << “Enter 3 for Yellow” << endl ;

12. cout << “Enter 4 for Green” << endl ;

13. cout << “Enter your choice: “ << endl ;

14. cin >> choice ;

15.

16. if (choice == 1)

17. cout << “White. You have a pure heart” << endl ;

18. else if (choice == 2)

19. cout << “Blue. Like the sky!” << endl;

20. else if (choice == 3)

21. cout << “Yellow. Cheerful always.” << endl;

22. else if (choice == 4)

23. cout << “Green. A mix of blue and yellow.” << endl ;

24. else

25. cout << “I cant find that. “ << endl;

26. cout << “Thanks for playing with me!” << endl;

27. return 0;

28. }

c. Compare the original Program 3.5 and the program from answer (b). Which selection control structure is easy to read?

Switch selection control structure is easy to read.