Chris Adkins

Week 6

Review Questions

16. True
False
False
True

21.
```
If (x<y) {
q = a + b;
} else {
q = x * 2;
}
```

23. True
False
True

24. True
False
True

35. A) line 2: << after semicolon.
No semicolon after int initializers.
If statement uses = instead of ==.
perfectScore never set to true or false.

B) Missing curly brackets in if statement.
Num1 should also be checked for zero.

C) Missing curly brackets in if statement.
If score is 90 or higher the invalid score will always print.
This can be avoided by moving the else below the last else if.

D) No breaks in switch statement.
testScore should be checked from high to low, rather than low to high.

Programming Projects
Software Sales

```
/*    Chapter No. 4 - Exercise No. 9
      File Name: SoftwareSales.cpp
      Programmer: Chris Adkins
      Date Last Modified: 10/2/2019
      CS 150 - Thursday 5:30PM

      Problem Statement:
      This program applies discounts to sales of a software depending
      on the amount of units sold.

      Overall Plan:
      1. Define discount, savings, cost, numSold, and itemPrice variables.
      2. Get numSold from the user using cin.
      3. Determine discount using if statements.
      4. Calculate the cost and savings using multiplication.
      5. Print the results to the user.

      Classes Needed and Purpose:
      <iostream> is used for input and output for the user.
      <iomanip> is used to print the results in standard monetary format.
*/

#include <iostream>
#include <iomanip>

using namespace std;

int main() {

      // These will all change based on the user's input, except for itemPrice.
      double discount  =    0.0;
      double savings   =    0.0;
      double cost      =    0.0;
      double numSold   =      0;
      double itemPrice = 199.99;

      cout << "Enter the number of units purchased: ";
      cin >> numSold;

      if (numSold >= 100) {
            discount = .5;
      } else if (numSold >= 50) {
            discount = .4;
      } else if (numSold >= 20) {
            discount = .3;
      } else if (numSold >= 10) {
            discount = .2;
      } else { // Basically if the numSold is less than 10.
            discount = 1; // Set to 1 because 0 would make the items free.
      }

      savings = numSold * itemPrice * discount;
      cost = (numSold * itemPrice) - (savings);

      cout << setprecision(2) << fixed << "Discount: \t" << discount * 100 << "%\nRetail Cost:
\t$"
      << numSold * itemPrice << "\nAmount Saved: \t$" << (numSold * itemPrice * discount) <<
"\nTotal Cost: \t$" << cost;
}
```

Geometry Calculator

```
/*    Chapter No. 4 - Exercise No. 11
      File Name:GeometryCalculator.cpp
      Programmer: Chris Adkins
      Date Last Modified: 10/2/2019
      CS 150 - Thursday 5:30PM

      Problem Statement:
      This program displays a menu and, depending on user choice,
      performs one of three geometric operations.

      Overall Plan:
      1. Define all of my variables used to store data given to us by the user.
      2. Display menu to user and save user choice.
      3. Use if statements to decide what code to run based on user choice.
      4. Perform necessary calculations to find area and print results to user.

      Classes Needed and Purpose:
      <iostream> Used for input and output for communication with the user.
*/
#include <iostream>
#include <cmath>
using namespace std;
int main() {
      double pi = 3.14159;
      double area;
      double radius;
      double length;
      double width;
      double height;
      int    choice;
      cout << "Geometry Calculator";
      cout << "\n\t1. Calculate the Area of a Circle";
      cout << "\n\t2. Calculate the Area of a Rectangle";
      cout << "\n\t3. Calculate the Area of a Triangle";
      cout << "\n\t4. Quit\n\n";
      cout << "Enter Your Choice: ";
      cin >> choice;
      if (choice == 1) {
            cout << "\nEnter the radius of the circle: ";
            cin >> radius;
            area = pi * pow(radius, 2);
            cout << "Area: " << area;
      } else if (choice == 2) {
            cout << "\nEnter the length of the rectangle: ";
            cin >> length;
            cout << "\nEnter the width of the rectangle: ";
            cin >> width;
            area = length * width;
            cout << "Area: " << area;
      } else if (choice == 3) {
            cout << "\nEnter the length of the triangle's base: ";
            cin >> length;
            cout << "\nEnter the height of the triangle: ";
            cin >> height;
            area = (height * length) / 2;
            cout << "Area: " << area;
      } else {
            return 0;
      }
}
```

Phone Service

```
/*    Chapter No. 4 - Exercise No. 22
      File Name: PhoneService.cpp
      Programmer: Chris Adkins
      Date Last Modified: 10/2/2019
      CS 150 - Thursday 5:30PM

      Problem Statement:
      This program creates a receipt to the user along with
      possible savings if the user chose another plan.

      Overall Plan:
      1. Declare all of our variables.
      2. Get input from user to determine the package selected as well as minutesUsed.
      3. Calculate the total cost of each package individually so they can be compared.
      4. Compare the total cost of each package.
      5. Print the user's info back to them along with possible savings from other packages.

      Classes Needed and Purpose:
      <iostream> For communication with the user.
      <iomanip> For printing in standard monetary format.
      <string> for getline().
*/

#include <iostream>
#include <iomanip>
#include <string>

using namespace std;

int main() {
      string         customerName;
      int        minutesGiven = 0; // Only used on Package A and B.
      int             minutesUsed;
      int            extraMinutes; // How many minutes over the limit.
      int                 package;
      double          monthlyRate;
      double additionalMinuteCost; // Only used on Package A and B. Cost per additional minute.
      double               totalA;
      double               totalB; // How much customer would pay with Package B.
      double               totalC; // How much customer would pay with Package C.

      cout << setprecision(2) << fixed;
      cout << "Enter your name: ";
      getline(cin, customerName);
      cout << "\nWhat package have you purchased?\n1. Package A\n2. Package B\n3. Package
C\nPlease enter your choice: ";
      cin >> package;
      cout << "\nHow many minutes have you used? ";
      cin >> minutesUsed;

      minutesGiven = 450;
      additionalMinuteCost = .45;
      monthlyRate = 39.99;
      if (minutesUsed > minutesGiven) {
            extraMinutes = minutesUsed - minutesGiven;
            totalA = (extraMinutes * additionalMinuteCost) + monthlyRate;
      } else {
            totalA = monthlyRate;
      }
```

```
	minutesGiven = 900;
	additionalMinuteCost = .4;
	monthlyRate = 59.99;
	if (minutesUsed > minutesGiven) {
		extraMinutes = minutesUsed - minutesGiven;
		totalB = (extraMinutes * additionalMinuteCost) + monthlyRate;
	} else {
		totalB = monthlyRate;
	}

	monthlyRate = 69.99;
	totalC = monthlyRate;

	cout << "\nCustomer Name: \t|" << customerName;
	cout << "\nMinutes Used: \t|" << minutesUsed;

	if (package == 1) {
		cout << "\nPackage: \t|A";
		cout << "\nTotal Cost: \t|$" << totalA;
		if (totalA > totalB) {
			cout << "\n\nWith Package B you would save: $" << totalA - totalB;
			if (totalA > totalC) {
				cout << "\nWith Package C you would save: $" << totalA - totalC;
			}
		}
	} else if (package == 2) {
		cout << "\nPackage: \t|B";
		cout << "\nTotal Cost: \t|$" << totalB;
		if (totalB > totalC) {
			cout << "\n\nWith Package C you would save: $" << totalB - totalC;
		}
	} else {
		cout << "\nPackage: \t|C";
		cout << "\nTotal Cost: \t|$" << totalC;
	}
}
```

Output

Software Sales Output

```
Enter the number of units purchased: 87
Discount:       40.00%
Retail Cost:    $17399.13
Amount Saved:   $6959.65
Total Cost:     $10439.48
```

Geometry Calculator Output

```
Geometry Calculator
        1. Calculate the Area of a Circle
        2. Calculate the Area of a Rectangle
        3. Calculate the Area of a Triangle
        4. Quit

Enter Your Choice: 1

Enter the radius of the circle: 6
Area: 113.097
```

```
Geometry Calculator
        1. Calculate the Area of a Circle
        2. Calculate the Area of a Rectangle
        3. Calculate the Area of a Triangle
        4. Quit

Enter Your Choice: 2

Enter the length of the rectangle: 10

Enter the width of the rectangle:
4
Area: 40
```

```
Geometry Calculator
        1. Calculate the Area of a Circle
        2. Calculate the Area of a Rectangle
        3. Calculate the Area of a Triangle
        4. Quit

Enter Your Choice: 3

Enter the length of the triangle's base: 12

Enter the height of the triangle: 4
Area: 24
```

Phone Service Output

```
Enter your name: Chris Adkins

What package have you purchased?
1. Package A
2. Package B
3. Package C
Please enter your choice: 1

How many minutes have you used? 750

Customer Name:  |Chris Adkins
Minutes Used:   |750
Package:        |A
Total Cost:     |$174.99

With Package B you would save: $115.00
With Package C you would save: $105.00
```