This is extra-credit homework to get more practice with programming, small steps at a time. Odd-numbered problems have answers on the next page, while you get credit for any even-numbered answers turned in. Practice doing both even and odd problems, using the answers as a guide afterward.

First, create a basic C++ program:

```
#include <iostream>
#include <string>
using namespace std;

int main()
{
    return 0;
}
```

For the turn-in problems (even numbered), you can have one right after another in the same program. Use a comment to specify which part of the code belongs to which problem. Example:

```
#include <iostream>
#include <string>
using namespace std;

int main()
{
    // Question 1.
    int number;

    // Question 2.
    char letter;

    return 0;
}
```

Submit the .cpp (C++ Source) file once you are done.

Questions: While Loops

Points possible: 3

1.	Create a float variable named **money**. Set it equal to **123.45**. Create a while loop that continues looping while **money** is more than **0**. Within the loop, output the value of **money.** Afterward, subtract **10.00** from **money**.
2.	Create an integer variable named **years**. Set it equal to 0. Create a while loop that continues looping while **years** is less than **75**. Within the loop, output the value of **years**. Afteward, add **1** to the **years**.
3.	Create a char variable called **userInput**. Initialize **userInput** to **N**. Create a while loop that continues looping while **userInput** is **N**. Within the loop, ask the user **Do you want to quit? Y or N**. Get the user input and store it in **userInput**.
4.	Create a char variable called **userInput2**. Initialize **userInput2** to **Y**. Create a while loop that continues looping while **userInput2** is **Y**. Within the loop, ask the user **Do you want to continue? Y or N**. Get the user input and store it in **userInput2**.
5.	Create a boolean called **done**. Initialize it to **false**. Create a while loop that continues looping while **done** is equal to **false**. Within the loop, ask the user **Do you want to quit? Y or N**. Get the user input and store it in a variable called **userInput3**. If **userInput3** is equal to **Y**, set **done** to **true**. If **userInput3** is equal to **N**, set **done** to **false**. Otherwise, output an error message, **Invalid Input**
6.	Create a boolean called **running**. Initialize it to **true**. Create an integer called **counter**. Initialize it to **10.** Create a while loop that continues looping while **running** is equal to **true**. Within the loop, decrement **counter** (subtract it by 1). If **counter** is equal to **1**, then set **running** to **false**. If **counter** is equal to **5**, then output **Hello, Five**. For all other values, only output the value of **counter**.

Answers: While Loops

1.

```
float money = 123.45;
while ( money > 0 )
{
    cout << "$" << money << endl;
    money = money – 10; // money -= 10; also works
}
```

3.

```
char userInput = 'N';
while ( userInput == 'N' )
{
    cout << "Do you want to quit? Y or N ";
    cin >> userInput;
}
```

5.

```
bool done = false;
while ( done == false )
{
    cout << "Do you want to quit? Y or N ";
    char userInput3;
    cin >> userInput3;

    if ( userInput3 == 'Y' )        { done = true; }
    else if ( userInput3 == 'N' )   { done = false; }
    else
    {
        cout << "Invalid Input" << endl;
    }
}
```

Questions: Do-While Loops

Points possible: 1

7.	Create a boolean variable named **again**, you do not need to initialize it. Create a do-while loop. The while condition is to loop while **again** is equal to **true**. Within the loop, ask the user for two numbers, then output the sum of those numbers. Then, output **Do you want to run again? yes or no.** Create a string to store the user's input. If their input is **yes**, then set **again** to true. Otherwise, set **again** to false.
8.	Create an integer variable named **product**. You do not need to initialize it. Create a do-while loop. The while condition is to loop while **product** is not equal to **25**. Within the loop, create two integers and ask the user to input two numbers. Set **product** to the product of the first integer times the second integer. (a * b). Output the product.

Answers: Do-While Loops

7.

```
bool again;
do
{
    int a, b;
    cin >> a >> b;
    cout << a + b << endl;
    cout << "Run again? yes or no ";
    string choice;
    cin >> choice;
    if ( choice == "yes" )
    {
        again = true;
    }
    else
    {
        again = false;
    }
} while ( again == true );
```

Questions: For Loops

Points possible: 4

9.	Write a for loop that uses an integer iterator variable called **c**. **c** starts at **0** and loops while it is less than **10**. Every time through the loop, it increments by one. Each time through the loop, output the value of **c**.
10.	Write a for loop that uses an integer iterator variable called **d**. **d** starts at **10** and loops while it is less than **100**. Every time through the loop, it increments by one. Each time through the loop, output the value of **d**.
11.	Write a for loop that uses an integer iterator variable called **e**. **e** starts at **20** and loops while it is greater than **0**. Every time through the loop, it decrements by **2**. Each time through the loop, output the value of **e**.
12.	Write a for loop that uses an integer iterator variable called **e**. **e** starts at **100** and loops while it is greater than **50**. Every time through the loop, it decrements by **5** Each time through the loop, output the value of **e**.
13.	Write a for loop that uses an integer iterator variable called **f**. **f** starts at **1** and loops while it is less than or equal to **1000**. Every time through the loop, it is multiplied by **2.** Each time through the loop, output the value of **f**. Note: f = f * 2 is also equal to f *= 2
14.	Write a for loop that uses an integer iterator variable called **g**. **g** starts at **100** and loops while it is greater than or equal to **0**. Every time through the loop, it is divided by **2.** Each time through the loop, output the value of **g**. Note: g = g / 2 is also equal to g /= 2
15.	Create an integer named **width**. Ask the user to input a value for **width**. Create a for loop that uses an integer iterator **x**, which starts at **0** and loops until it is equal to **width**. Increment by 1 each time. Within the loop, output an asterisk * without any new-lines. The result should be a horizontal line.
16.	Create an integer named **height**. Ask the user to input a value for **height**. Create a for loop that uses an integer iterator **y**, which starts at **0** and loops until it is equal to **height**. Increment by 1 each time. Within the loop, output an asterisk * with a new-line at the end. The result should be a vertical line.

Answers: For Loops

9.	`for ( int c = 0; c < 10; c++ )`
	`{`
	`    cout << c << endl;`
	`}`

11.	`for ( int e = 20; e > 0; e -= 2 )`
	`{`
	`    cout << e << endl;`
	`}`

13.	`for ( int f = 1; f <= 1000; f *= 2 )`
	`{`
	`    cout << f << endl;`
	`}`

15.	`int width;`
	`cout << "Width: ";`
	`cin >> width;`
	
	`for ( int x = 0; x < width; x++ )`
	`{`
	`    cout << "*";`
	`}`