**1. Output for code segment:**

Output:

endlendl

grendel

There is a new line between “endlendl” and “grendl”.

**2. Explain what the program does.**

The program takes an integer input and stores it in the variable called “side.”

Then, the program outputs a triangle/pyramid made out of “#” with the top row having just one “#” and the bottom row having the same number of “#” as the variable side has stored.

For example, if side was 3, the program would output:

#

##

###

Let’s walk through the nested for loop. When you enter, i is set to 0. 0 is less than 3, which side is equal to. So, it continues through inside the first for loop. Now, it tries to enter the second for loop. j is set to i, which in this case is 0. 0 >= 0 is true, so it enters that loop and outputs “#”. j now decrements and is -1. Since j=-1 < 0, the program exits the “j” loop and prints out a new line. It has reached the end of the “i” loop so i increments to 1.

1 is still less than side, which is 3, so once again we enter the inner for loop. This time, the program loops twice and outputs two “#” before exiting and printing another newline. i increments once more and is now 2. 2 < 3, so the program enters the inner for loop, which loops three times and outputs three “#” before exiting with a newline. i increments and is now 3. Since 3 < 3 is false, the program exits both loops and ends.

This would apply for any other input of side as long as side was positive. Entering a negative number wouldn’t produce any ouput. For example, side being equal to 10 would output:

#

##

###

####

#####  
######

#######

########  
#########  
##########

**3. Change the program in 2 so it outputs the same thing but using a while loop.**

#include <iostream>

using namespace std;

int main()

{

int side;

cout << "Enter a number: ";

cin >> side;

for (int i = 0; i < side; i++)

{

int j = i;

while (j >= 0)

{

cout << "#";

j--;

}

cout << "\n";

}

}

**4. Use a do-while loop to do the same thing.**

#include <iostream>

using namespace std;

int main()

{

int side;

cout << "Enter a number: ";

cin >> side;

int i = 0;

do {

if (side <= 0) {

break;

}

else

{

int j = i;

while (j >= 0)

{

cout << "#";

j--;

}

cout << "\n";

i++;

}

}

while (i < side);

}

**5. Switch statement for the if statements for the California Penal Code**

switch (codeSection) {

case 281:

cout << "bigamy";

break;

case 321:

cout << "selling illegal lottery tickets";

break;

case 322:

cout << "selling illegal lottery tickets";

break;

case 383:

cout << "selling rancid butter";

break;

case 598:

cout << "injuring a bird in a public cemetery";

break;

default:

cout << "some other crime";

break;

}