Christopher Bussen

CPS 150 02 – Algorithms and Programming 1

Long Week Project 2

11/19/20

**Problem 1 Algorithm**

1. Start the program
2. Create a for loop with an integer (i) that starts at 1 and goes until the integer is greater than 5, incrementing by 1 each time
3. Create another for loop with a different integer variable that starts at 5 and goes until it is less than or equal to i, decrementing by 1 each time
4. Inside this inner for loop, print a space and move out of the inner for loop
5. Create another for loop with a another integer variable that starts at 1 and goes until the integer is greater than i, incrementing by 1 each time
6. Inside the inner for loop, print a star and a space
7. Move out of the inner loop and print a new line
8. End the program

**Problem 1 Running Screenshot**

**Graphical user interface, text

Description automatically generated**

**Problem 1 Code**

/\*

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P1StarPyramid: no inputs ; string string string string string

program uses nested for loops to print out a pyramid pattern of

stars that opens down

\*/

public class P1StarPyramid {

public static void main(String [] args){

//use for loops to print the pattern

for(int i = 1; i <= 5; i++){

//nested for loop to print spaces

for(int j = 5; j > i; j--){

System.out.print(" ");

}

//print the stars with a space after

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

System.out.print("\* ");

}

//print a new line

System.out.println();

}

}

}

**Problem 2 Algorithm**

1. Start the program
2. Create a for loop with an integer that starts at 1 and goes until the integer is greater than 5, incrementing by 1 each time
3. Create another for loop with a different integer variable that starts at 1 and goes until the integer is greater than the integer used in the outer loop, incrementing by 1 each time
4. Inside the inner for loop, print a star and a space
5. Move out of the inner loop and print a new line
6. End the program

**Problem 2 Running Screenshot**

**Text

Description automatically generated**

**Problem 2 Code**

/\*

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P2TrianglePattern: no inputs ; string string string string string

program uses nested for loops to print out a triangle pattern of stars that opens to the right

\*/

public class P2TrianglePattern {

public static void main(String [] args){

//use nested for loops to print the pattern

for(int i = 1; i <= 5; i++){

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

//print the star i times

System.out.print("\* ");

}

//move to the next line before incrementing i

System.out.println();

}

}

}

**Problem 3 Algorithm**

1. Start the program
2. Create a for loop with an integer (i) that starts at 1 and goes until the integer is greater than 5, incrementing by 1 each time
3. Create another for loop with a different integer variable that starts at 1 and goes until the integer is greater than 5 – i, incrementing by 1 each time
4. Inside this inner for loop, print a space and move out of the inner for loop
5. Create another for loop with a another integer variable that starts at 1 and goes until the integer is greater than i, incrementing by 1 each time
6. Inside the inner for loop, print a star
7. Move out of the inner loop and print a new line
8. End the program

**Problem 3 Running Screenshot**

**Graphical user interface, text

Description automatically generated**

**Problem 3 Code**

/\*

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P3TrianglePattern: no inputs ; string string string string string

program uses nested for loops to print out a triangle pattern of stars

that opens to the left

\*/

public class P3TrianglePattern {

public static void main(String [] args){

//use nested for loops to print the pattern

for(int i = 1; i <= 5; i++){

for(int j = 1; j<= 5 - i; j++){

System.out.print(" ");

}

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

//print the star i times

System.out.print("\*");

}

//move to the next line before incrementing i

System.out.println();

}

}

}

**Problem 4 Algorithm**

1. Start the program
2. Create a String variable that holds the set of letters you want to use for the pyramid
3. Create a for loop with an integer (i) that starts at 1 and goes until the integer is greater than the length of the letters variable, incrementing by 1 each time
4. Create another for loop with a different integer variable that starts at the length of the letters variable and goes until the length is less than or equal to i, decrementing by 1 each time
5. Inside this inner for loop, print a space and move out of the inner for loop
6. Create another for loop with a another integer variable that starts at 0 and goes until the integer is greater than or equal to i, incrementing by 1 each time
7. Inside the inner for loop, print the letters character at position k and a space
8. Move out of the inner loop and print a new line
9. End the program

**Problem 4 Running Screenshot**

**Text

Description automatically generated**

**Problem 4 Code**

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P4LetterPyramid: no inputs ; string string string string string

program uses nested for loops to print out a pyramid pattern of

letters that opens down

\*/

public class P4LetterPyramid {

public static void main(String [] args){

//declare a string variable for the set of letters that will be used

String letters = "ABCDEF";

//use for loops to print the pattern

for(int i = 1; i <= letters.length(); i++){

//nested for loop to print spaces

for(int j = letters.length(); j > i; j--){

System.out.print(" ");

}

//print the letters up to the i position in the string

for(int k = 0; k < i; k++){

System.out.print(letters.charAt(k) + " ");

}

//print a new line

System.out.println();

}

}

}

**Problem 5 Algorithm**

1. Start the program
2. Create a for loop with an integer (x) that starts at 1 and goes until the integer is greater than 5, incrementing by 1 each time
3. Create another for loop with a different integer variable that starts at 1 and goes until it is greater than or equal to x, incrementing by 1 each time
4. Inside this inner for loop, print a space and move out of the inner loop
5. Create another for loop with a another integer variable that starts at 5 and goes until the integer is less than x, decrementing by 1 each time
6. Inside the inner for loop, print a star and a space
7. Move out of the inner loop and print a new line
8. Move out of the outer for loop
9. Create a new for loop with an integer (i) that starts at 1 and goes until the integer is greater than 5, incrementing by 1 each time
10. Create another for loop with a different integer variable that starts at 5 and goes until it is less than or equal to i, decrementing by 1 each time
11. Inside this inner for loop, print a space and move out of the inner for loop
12. Create another for loop with a another integer variable that starts at 1 and goes until the integer is greater than i, incrementing by 1 each time
13. Inside the inner for loop, print a star and a space
14. Move out of the inner loop and print a new line
15. End the program

**Problem 5 Running Screenshot**

**Text

Description automatically generated**

**Problem 5 Code**

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P5StarHourglass: no inputs ; string string string string string

program uses nested for loops to print out an hourglass pattern of stars

\*/

public class P5StarHourglass {

public static void main(String [] args){

//use for loops to print the top of the pattern

for(int x = 1; x <= 5; x++){

//nested for loop to print spaces

for(int y = 1; y < x; y++){

System.out.print(" ");

}

//print the stars with a space after

for(int z = 5; z >= x; z--){

System.out.print("\* ");

}

//print a new line

System.out.println();

}

//use for loops to print the bottom of the pattern

for(int i = 1; i <= 5; i++){

//nested for loop to print spaces

for(int j = 5; j > i; j--){

System.out.print(" ");

}

//print the stars with a space after

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

System.out.print("\* ");

}

//print a new line

System.out.println();

}

}

}