Exercises If and If-else Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period:\_\_\_\_\_\_

Determine the outcome of each piece of code:

1. int age = 19;

if (age >= 18)

System.out.println("You may vote");

else

System.out.println("You are not allowed to vote");

2. int age = 15;

if (age > 15)

System.out.println("You may get a driver's license");

else

if (age < 15)

System.out.println("You may not drive");

else

System.out.println("You may get a permit");

3. int x = 5;

if (x > 0)

{

x = x + 15;

System.out.println(x);

}

else

System.out.println("Error");

4. int x = 5;

if (x > 6)

x = x + 1;

else

if (x > 3)

x = x + 2;

else

x = x + 5;

System.out.println(x);

5. Write a piece of code to do the following:

If the user enters 1, display your name. If the user enters 2, display your

favorite color. Otherwise, display your year (freshman, sophomore, etc). Here's a

piece of code to get your started:

int num;

System.out.println("Please enter 1 or 2");

num = input.nextInt();

6. Write a piece of code to do to the following:

If the user enters 1, add x and y and display the result. If the user enters 2,

multiply x and y and display the result. Otherwise, display "Good-bye!".

int x = 5, y = 3;

int num;

System.out.println("Please enter 1 or 2");

num = input.nextInt();

Exercises For-loops Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period:\_\_\_\_\_\_

State how many times each block of code will cause karel to move.

**Warning: some loops may be infinite, and some may not run at all.**

**1) for** (**int** i=0; i < 10; i++)

*karel*.move(); \_\_\_\_\_\_\_\_\_\_

**2) for** (**int** i=1; i <= 10; i++)

*karel*.move(); \_\_\_\_\_\_\_\_\_\_

**3) for** (**int** i=10; i >=1; i--)

*karel*.move(); \_\_\_\_\_\_\_\_\_\_

**4) for** (**int** i=10; i > 0; i--)

*karel*.move(); \_\_\_\_\_\_\_\_\_\_

**5) for** (**int** i=0; i > 10; i++)

*karel*.move(); \_\_\_\_\_\_\_\_\_\_

**6) for** (**int** i=1; i <= 10; i--)

*karel*.move(); \_\_\_\_\_\_\_\_\_\_

**7) for** (**int** i=10; i > 1; i++)

*karel*.move(); \_\_\_\_\_\_\_\_\_\_

**8) for** (**int** i=10; i >= 1; i++)

*karel*.move(); \_\_\_\_\_\_\_\_\_\_

**9) for** (**int** i=0; i < 10; i++)

*karel*.move(); \_\_\_\_\_\_\_\_\_\_

**10) for** (**int** i=0; i < 10; i=i+2)

*karel*.move(); \_\_\_\_\_\_\_\_\_\_

**11) for** (**int** i=0; i <= 10; i=i+2)

*karel*.move(); \_\_\_\_\_\_\_\_\_\_

**12) for** (**int** i=0; i <= 10; i=i-5)

*karel*.move(); \_\_\_\_\_\_\_\_\_\_

**13) for** (**int** i=0; i < 10; i=i\*2)

*karel*.move(); \_\_\_\_\_\_\_\_\_\_

**14) for** (**int** i=0; i <= 10; i++)

**for** (**int** j=0; j <= 10; j++)

*karel*.move(); \_\_\_\_\_\_\_\_\_\_

For the following, make the code body write the value of i:

Example: write a for loop that starts at 0 and ends at 10 exclusive:

for(int i=0; i < 10; i++)

System.out.print(i + “ “);

**15)** write a for-loop that starts at 3, goes up to and including 200 and increases 1 at a time:

**16)** write a for-loop that starts at 64, goes down to but not including 0 and decreases by cutting itself in half each time:

**17)** write a for-loop that traverses through every even number between 64 and 128 inclusive:

**18)** write a for-loop that traverses through every multiple of 5 between 1 and 100 inclusive.

**19)** write a for loop that traverses through every power of 2 between 1 and 512 exclusive.

**20)** write a for loop that repeats 5 times (by any means), and then repeat that process 100 times:

Exercises Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If statement & Loops I Period:

Show the output of the following blocks of code given:

final int MIN = 10, MAX = 20;

1) MIN MAX num output

int num = 15; 10 20

**if** (num < MAX)

{

System.out.println (num);

num = num + 1;

}

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2) MIN MAX num output

int num = 15; 10 20

**while** (num < MAX)

{

System.out.println (num);

num = num + 1;

}

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3) MIN MAX num output

int num = 15; 10 20

**if** (num < MAX)

{

num = num + 1;

System.out.println (num);

}

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4) MIN MAX num output

int num = 15; 10 20

**while** (num < MAX)

{

num = num + 1;

System.out.println (num);

}

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5) MIN MAX num output

int num = 15; 10 20

**if** (num < MAX)

{

System.out.println (num);

num = num - 1;

}

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6) MIN MAX num output

int num = 15; 10 20

**while** (num < MAX)

{

System.out.println (num);

num = num - 1;

}

7) MIN MAX num output

int num = 15; 10 20

**if** (num > MIN)

{

System.out.println (num);

num = num - 1;

}

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8) MIN MAX num output

int num = 15; 10 20

**while** (num > MIN)

{

System.out.println (num);

num = num - 1;

}

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9) MIN MAX num output

int num = 15; 10 20

**if** (num < MAX)

{

System.out.println (num);

num += 2;

}

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10) MIN MAX num output

int num = 15; 10 20

**while** (num < MAX)

{

System.out.println (num);

num += 2;

}

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11) MIN MAX num output

int num = 15; 10 20

**if** (num < MAX)

{

if (num%2 == 0)

System.out.println (num);

num++;

}

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_12) MIN MAX num output

int num = 15; 10 20

**while** (num < MAX)

{

if (num%2 == 0)

System.out.println (num);

num++;

}

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Exercises – Error Checking** Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period\_\_\_\_\_\_\_\_\_\_\_

A program can be made more robust by error checking user input. This can help avoid exception throwing as well as output that may not make sense. Here is an example:

System.out.println("Enter a number greater than 10");

num = input.nextInt();

while (num <= 10)

{

System.out.println("That number is invalid because it is not greater than 10");

System.out.println("Enter a positive number");

num = input.nextInt();

}

The general outline is:

ask for user input

read in user input

while (user input is invalid)

{

tell the user why their input is bad

ask for and read in the user input again

}

Write the error checking required for each situation:

1) double x;

System.out.println("Enter a number to find the square root of");

x = input.nextDouble();

2) int age;

System.out.println("Enter your age in years");

age = input.nextInt();

3) double n;

System.out.println("Enter a number to find the reciprocal of (1/n)");

n = input.nextDouble();

4) int rating;

System.out.println("Enter a rating between (1-100), 1 being the worst and 100 being the best");

rating = input.nextInt();

5) String option;

System.out.println(“Pick an option: a) to add, s) to subtract, m) to multiply”);

option = input.nextLine();

You can use modulous (%) to check the divisibility of numbers in error checking:

If num%5 == 0, it means that there is NO remainder between num and 5,

and thus num IS divisible by 5 (num is a multiple of 5).

If num%3 != 0, it means that there IS a remainder between num and 3,

and this num is NOT divisible by 3 (num is not a multiple of 3).

Complete the conditions for the following error checking situations:

6) System.out.println(“Enter a number that is a multiple of 10”);

num = input.nextInt();

while( )

{

System.out.println(“This is not a multiple of 10. Enter a number that is”);

num = input.nextInt();

}\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7) System.out.println(“Enter an even number”);

num = input.nextInt();

while( )

{

System.out.println(“This is not an even number. Enter a number that is”);

num = input.nextInt();

}\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8) System.out.println(“Enter an odd number”);

num = input.nextInt();

while( )

{

System.out.println(“This is not an odd number. Enter a number that is”);

num = input.nextInt();

}\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9) System.out.println(“Enter a degree amount that is not a multiple of 180”);

deg = input.nextDouble();

while( )

{

System.out.println(“This is a multiple of 180. Enter a number that isn’t”);

deg = input.nextDouble();

}

ans = 1 / Math.sin(deg \* Math.PI / 180.0);

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10) System.out.println(“Enter an even number that is not a multiple of 4”);

num = input.nextInt();

while( )

{

System.out.println(“Invalid -Enter an even number that is not a multiple of 4”);

num = input.nextInt();

}\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Exercises – Randomness** Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period\_\_\_\_\_\_\_\_\_\_\_

Example:

Given an int called ran, write the code that will return a number between 5 and 15, including both i.e., [5,15]:

ran = (int)(Math.random() \* 11) + 5;

# Given an int called ran, write the code that will:

1. return a random number between 0 and 100, exclusive (including 0, not including 100).
2. return a random number between 7 and 21, inclusive.
3. return the result of a flipped coin (0 – heads, 1- tails).
4. return the result of a rolled die (1-6, inclusive).
5. Complete the code that will ask the user to enter a minimum value (min) and a maximum value (max). The program will then find a random number between min and max inclusive.

int min, max, pick;

System.out.println(“enter minimum value”);

min = input.nextInt();

System.out.println(“enter a maximum value”);

max = input.nextInt();

pick =

System.out.println(“The computer picks: “ + pick);

1. Consider the titles of three songs that you like. Write the code that will pick one of the three at random to display on the screen.