In-class activity 9 – Boolean expressions, logical operators, and if statements

NAME:

1. Indicate whether each Boolean expression below evaluates to True or False. Let **n=10** and **k=20**. Test your answer in Thonny. For example, in Python you could write:

```
n = 10
k = 20
print( (n>10) and (k==20) )
```

     a. (n>10) and (k==20)

     b. (n==10) and (k==20)

     c. (n>10) or (k==20)

     d. not((n>10) and (k==20))

     e. (n>10) or (k==10 or k!=5).

     f. (not(n>10)) and (not(k==20))

     g. (n>10) or (k==10 or k != 5)

     h. (n<20) or (k==20)

     i. (n>=10) and (k<=20)

2. Give a Boolean expression for each of the following. Determine if variable **num** is:
    a. greater than or equal to 0 and less than 100.

    b. less than 100 and greater than or equal to 0, or it is equal to 200.

    c. a strictly positive number but not larger than 150 (inclusive).

3. Consider these lines of code to answer the following questions. Test your answer in Thonny.

```
if x>5:
    print("A")
elif y<10:
    print("B")
elif x==10:
    print("C")
else:
    print("D")
```

     a. What prints out if initially x = 5 and y = 11?

     b. What prints out if initially x = 10 and y = 11?

     c. What prints out if initially x = 0 and y = 5?

     d. Is there any value of x or y that will print "C"?

4. A fruit company sells oranges for 32 cents per pound, plus $7.50 per order for shipping. If an order weighs more than 100 pounds, the shipping cost is reduced by $1.50. Write a function that will take the number of pounds as oranges as a parameter and returns the cost of the order. Test your function by calling it with various inputs. Copy your function definition below.

5. Early in the semester we talked about Hailstone numbers (also known as the Collatz conjecture). To compute the next hailstone number from the current one, we use the following algorithm:

   If the number is even, then the next hailstone number is computed by dividing the number by 2.
   If the number is odd, then then next hailstone number is computer by multiplying the number by 3 and adding 1

   Write a function that takes the current hailstone number and returns the next hailstone number.

   Note: To determine whether a number is odd or even. Look at this site:
   modulo link

   Note: When an even number is divided by 2, the remainder is 0, and when an odd number is divided by 2 the remainder is 1.

Turn in this document (either after class or bring to the next class meeting). Submit your python code to that you used to test to Moodle.