Name: ___________________________  Partner: ___________________________

Python Activity 32: Random

Learning Objectives
Students will be able to:
Content:
• Describe what the random module does
Process:
• Write code that uses the random module: randint, shuffle, choice, random

Prior Knowledge
• Python concepts from Activities 1-22.

Folks, this is a brand new activity. If you encounter any issues/typos, please let Iris know.

Critical Thinking Questions:

1. Examine the sample code below.

```python
0 >>> from random import randint
1 >>> weather = ['sunny', 'snowy', 'rainy', 'cloudy']
2 >>> rchoice = randint(0,3)
3 >>> rchoice
4 2
5 >>> today = weather[rchoice]
6 >>> print('Today it is', today)
7 'rainy'
8 >>> print('Tomorrow it is', weather[randint(0,3)])
9 'sunny'
```

a. How many elements are in the weather list? _______

b. What index within the weather list does 'rainy' appear on line 1? _______

c. What is stored in rchoice on line 2? _______

d. What is stored in today?: _________________________________

e. What index within the weather list does 'sunny' appear on line 1? _______

f. What is the second argument passed to the, print statement on line 8?: _______

g. If we were to write an 10th line, print('Saturday it is', weather[randint(0,3)])
what might be some possible outputs?: ___________________________

h. What does the randint function do?: _______________________________
2. Examine the sample code below.

```python
from random import choice
weather = ['sunny', 'snowy', 'rainy', 'cloudy']
yesterday = choice(weather)
yesterday
choice(weather)
choice(weather)
```

a. How many elements are in the `weather` list? _______
b. What index within the `weather` list does 'snowy' appear on line 1? _______
c. What is stored in `yesterday` on line 2? _______
d. What differs about the line 0 above and the line 0 on the previous question?:

```
Filter name: random.randint
The `random.randint` function generates a random integer between two given values, inclusive.
```

e. If we were to make a third call to `choice(weather)` on line 9, what might be some possible outputs?: ________________________________

```python
from random import choice
weather = ['sunny', 'snowy', 'rainy', 'cloudy']
yesterday = choice(weather)
yesterday
choice(weather)
choice(weather)
```

f. What does the `random.choice` function do?:

```
Filter name: random.choice
The `random.choice` function selects a random element from a sequence (lists, tuples, strings, etc.)
```

3. Examine the sample code below.

```python
from random import shuffle
ranks = list(range(1,14))
shuffle(ranks)
ranks
shuffle(ranks)
ranks
```

```python
from random import shuffle
ranks = list(range(1,14))
shuffle(ranks)
ranks
shuffle(ranks)
ranks
```

a. What index within the `ranks` list does 7 appear on in line 3? _______
b. What index within the `ranks` list does 7 appear on line 6? _______
c. What index within the `ranks` list does 7 appear on line 8? _______
d. What differs about the line 0 above and the line 0 on the previous questions?:

```
Filter name: random.randint
The `random.randint` function generates a random integer between two given values, inclusive.
```
e. What does the `random.shuffle` function do?

f. Write a few lines of code to shuffle the following list `suits = ['heart', 'spade', 'club', 'diamond']` and then combine with the shuffled ranks list above, create a shuffled deck of cards:

```python
# Example code
import random
suits = ['heart', 'spade', 'club', 'diamond']
ranks = ['2', '3', '4', '5', '6', '7', '8', '9', '10', 'J', 'Q', 'K', 'A']
shuffled_suits = random.sample(suits, len(suits))
shuffled_ranks = random.sample(ranks, len(ranks))
shuffled_deck = [f'{rank} of {suit}' for rank in shuffled_ranks for suit in shuffled_suits]
print(shuffled_deck)
```

FYI: The `random.shuffle` function randomly reassigns elements in a mutable sequence.

4. Examine the sample interactive python code below.

```python
0 >>> from random import random
1 >>> random()
2 0.2535287898652099
3 >>> random()
4 0.6961106219037502
5 >>> random()
6 0.4566550234538197
7 >>> random()
8 0.7593131980640184
```

a. What differs about the line 0 above and the line 0 on the previous questions?

b. What arguments does the `random` function require? _______

c. How does this differ from the other random module functions we just explored?:

```python
4.646
```

d. If you had to guess, what might the minimum and maximum values the `random` function generates? __________________

e. What might the `random.random` function do?:

FYI: The `random.random` function randomly generates a floating point number between 0.0 (inclusive) and 1.0 (exclusive).
Application Questions: Use the Python Interpreter to check your work

1. A lottery number consists of five two-digit numbers. Write some lines of code to generate a random lottery number:

   a. Using `random.choice(.)`:

   ______________________________________________________
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

   b. Using `random.randint(.)`:

   ______________________________________________________
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

   c. Using `random.random(.)`:

   ______________________________________________________
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

2. A card-deck consists of 52 cards in a list. Each card has one of 4 suits (hearts, clubs, diamonds, spades) and one of 12 ranks (2-10, jack, queen, king, ace). A card is represented by a tuple of suit and rank, and there are no duplicate cards in a deck (i.e., there is only one ('hearts', 'queen') and only one ('spades', 'ace') and only one ('diamonds', 5) in each deck). Write some python to randomly generate a deck of cards meeting these constraints:

   ______________________________________________________
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________