Python Random module

What is a Random Number?

Random number does NOT mean a different number every time. Random means something that can not be predicted logically.

The Python Random module is a built-in module for generating random integers in Python. These numbers occur randomly and does not follow any rules or instructuctions. We can therefore use this module to generate random numbers, display a random item for a list or string, and so on.

The random() Function

The random.random() function gives a float number that ranges from 0.0 to 1.0. There are no parameters required for this function. This method returns the second random floating-point value within [0.0 and 1] is returned.

Code

```
# Python program for generating random float number

import random

num=random.random()

print(num)
```

The randint() Function

The random.randint() function generates a random integer from the range of numbers supplied.

Code

```
# Python program for generating a random integer

import random

num = random.randint(1, 500)

print( num )
```

The randrange() Function

The random.randrange() function selects an item randomly from the given range defined by the start, the stop, and the step parameters. By default, the start is set to 0. Likewise, the step is set to 1 by default.

Code

```
# To generate value between a specific range

import random

num = random.randrange(1, 10)

print( num )

num = random.randrange(1, 10, 2)

print( num )
```

The choice() Function

The random.choice() function selects an item from a non-empty series at random. In the given below program, we have defined a string, list and a set. And using the above choice() method, random element is selected.

Code

```
# To select a random element

import random

random_s = random.choice('Random Module') #a string

print( random_s )

random_l = random.choice([23, 54, 765, 23, 45, 45]) #a list

print( random_l )

random_s = random.choice((12, 64, 23, 54, 34)) #a set

print( random_s )
```

The shuffle() Function

The random.shuffle() function shuffles the given list randomly.

Code

```
# To shuffle elements in the list

list1 = [34, 23, 65, 86, 23, 43]

random.shuffle( list1 )

print( list1 )

random.shuffle( list1 )

print( list1 )
```

Rock-Paper-Scissor Program using Random Module

Code

```
# import random module
import random
# Function to play game
def start_game():
    # Print games rules and instructions
    print(" This is Disha's Rock-Paper-Scissors! ")
    print(" Please Enter your choice: ")
    print(" choice 1: Rock ")
    print(" choice 2: Paper ")
    print(" choice 3: Scissors ")
#To take the user input
choice_user = int(input(" Select any options from 1 - 3 : "))
    # randint() Function which generates a random number by computer
    choice_machine = random.randint(1, 3)
    # display the machines choice
    print(" Option choosed by Machine is: ", end = " ")
    if choice_machine == 1:
        print(" Rock ")
    elif choice_machine == 2:
        print("Paper")
    else:
        print("Scissors")
    # To declare who the winner is
    if choice_user == choice_machine:
        print(" Wow It's a tie! ")
    elif choice_user == 1 and choice_machine == 3:
        print(" Congratulations!! You won! ")
    elif choice_user == 2 and choice_machine == 1:
        print(" Congratulations!! You won! ")
    elif choice_user == 3 and choice_machine == 2:
```

```
        print(" Congratulations!! You won! ")
    else:
        print(" Sorry! The Machine Won the Game? ")


    # If user wants to play again
    play_again = input(" Want to Play again? ( yes / no ) ").lower()
    if play_again == " yes ":
        start_game()
    else:
        print(" Thanks for playing Rock-Paper-Scissors! ")
# Begin the game
start_game()
```

Generate Random Number

NumPy offers the random module to work with random numbers.

Example

Generate a random integer from 0 to 100:

```
from numpy import random
x = random.randint(100)
print(x)
```

Generate Random Float

The random module's rand() method returns a random float between 0 and 1.

Example

Generate a random float from 0 to 1:

```
from numpy import random
x = random.rand()
print(x)
```

Generate Random Array

In NumPy we work with arrays, and you can use the two methods from the above examples to make random arrays.

Integers

The randint() method takes a size parameter where you can specify the shape of an array.

Example

Generate a 1-D array containing 5 random integers from 0 to 100:

```
from numpy import random

x=random.randint(100, size=(5))

print(x)
```

Example

```
from numpy import random

x = random.randint(100, size=(3, 5))

print(x)
```

Floats

The rand() method also allows you to specify the shape of the array.

Example

```
from numpy import random

x = random.rand(5)

print(x)
```

Example

```
from numpy import random

x = random.rand(3, 5)

print(x)
```

Generate Random Number From Array

The choice() method allows you to generate a random value based on an array of values.

The choice() method takes an array as a parameter and randomly returns one of the values.

Example

Return one of the values in an array:

```
from numpy import random

x = random.choice([3, 5, 7, 9])

print(x)
```

The choice() method also allows you to return an array of values.

Add a size parameter to specify the shape of the array.

Example

Generate a 2-D array that consists of the values in the array parameter (3, 5, 7, and 9):

```
from numpy import random

x = random.choice([3, 5, 7, 9], size=(3, 5))

print(x)
```