

# The Random Module

Creates pseudo-random numbers

Coming up: Randrange

## Randrange

- randrange( [start,] stop [, step] )
  - Returns a randomly selected element from the specified range
  - works with integers

```
import random
def randRangeTest():
    numberOfLoops = 100
    while (numberOfLoops > 0):
        print random.randrange(10),
        numberOfLoops -= 1
```

```
>>>
8 5 8 8 8 7 2 8 5 2 6 5 8 3 8 2 4 7 0 2 8
8 7 9 2 6 0 1 9 8 7 0 3 6 0 0 5 8 1 9 9 3
4 8 5 7 8 0 3 5 4 1 8 8 1 3 4 5 8 7 8 1 5
1 6 6 3 6 2 7 8 2 1 0 8 1 1 6 6 2 3 5 5 4
9 2 9 2 8 7 7 3 5 6 2 5 6 6 5 2
>>> |
```

Coming up: Randrange

## Randrange

- randrange( [start,] stop [, step] )

```
def randRangeTest2():
    numberOfLoops = 100
    while (numberOfLoops > 0):
        print random.randrange(5, 10, 2),
        numberOfLoops -= 1
```

```
>>>
5 7 9 5 9 9 7 7 7 7 9 5 5 9 9 7 7 7 5 7 5
5 9 5 5 7 7 5 9 9 7 5 7 5 9 7 7 5 7 5 9 9
5 7 7 5 9 7 5 5 9 5 7 5 7 7 5 7 9 5 5 7
7 7 7 7 9 7 5 5 9 5 9 5 9 7 5 7 7 9 5 7 5
5 9 9 7 9 7 5 5 5 7 5 9 5 9 5 9
>>> |
```

Coming up: Randint Function

## Randint Function

- randint(a,b)
  - returns a random integer N such that:
    - a ≤ N ≤ b

```
def randintTest():
    numberOfLoops = 100
    while (numberOfLoops > 0):
        print random.randint(2, 8),
        numberOfLoops -= 1
```

```
>>>
5 2 6 7 2 7 7 4 4 5 7 3 5 6 3 4 7 5 5 4 7
8 5 4 3 4 5 5 3 7 2 7 5 6 5 4 4 6 4 7 3 5
2 8 8 6 4 4 5 6 8 8 2 3 6 5 8 4 7 4 4 2 4
4 5 5 8 3 3 5 5 3 8 7 8 6 8 2 5 6 3 7 7
4 7 8 7 4 8 4 2 4 4 5 5 7 2 5 5
>>> |
```

Coming up: Choice function

## Choice function

- `choice( sequence )`
  - Returns a random element from a non-empty sequence (e.g. a String)

```
def choiceTest():
    numberOfLoops = 100
    while (numberOfLoops > 0):
        print random.choice('abcdefghi'),
        numberOfLoops -= 1
```

```
>>>
a a f a h g g g e c h b c c c f d d a g e
c d a a d l e i l c g c h a b b a c i b b
h d d c f i b d e d c h f i h f c h e
b a d i b e i b c f c h b b e d a h a c g
h c g a e a f b a i d c d g h c
>>> |
```

Coming up: Random function

## Random function

- `random()`
  - Returns the next random floating point number in the range 0.0 → 1.0

```
def randomTest():
    numberOfLoops = 5
    while (numberOfLoops > 0):
        print random.random()
        numberOfLoops -= 1
```

```
>>>
0.736005728634
0.724793477555
0.229009105097
0.0644102012379
0.107595401842
>>>
```

Coming up: Uniform Function

## Uniform Function

- `uniform(a,b)`
  - Returns a random real number N such that:
    - $a \leq N < b$

```
def uniformTest():
    numberOfLoops = 5
    while (numberOfLoops > 0):
        print random.uniform(2.1, 2.11)
        numberOfLoops -= 1
```

```
>>>
2.10146752382
2.1061264019
2.10500438201
2.10387281611
2.10536665405
>>> |
```

Coming up: How random is it?

## How random is it?

- Lets plot some random points and see what it looks like
- `randomTest/RandomTester.py`
- (Note: This code is to demonstrate random only... we haven't yet learned many concepts used in the program)

End of presentation