

Random Numbers

You can generate a seemingly random sequence of numbers using the Python `random` module. A mathematical function is used to produce the sequence based on a *seed* value. If no seed is given, the current system time is used.

Python code	Shell output
<code>import random</code>	
<code>randint(1, 10)</code>	<code>NameError: name 'randint' is not defined</code>
<code>random.randint(1, 10)</code>	5
<code>random.randint(1, 10)</code>	2
<code>seed(100)</code>	<code>NameError: name 'seed' is not defined</code>
<code>random.seed(100)</code>	
<code>random.random()</code>	0.1456692551041303
<code>random.random()</code>	0.45492700451402135
<code>random.seed(100)</code>	
<code>random.random()</code>	0.1456692551041303
<code>random.random()</code>	0.45492700451402135

Questions (20 min)

Start time:

1. What is the name of the module that must be imported to generate random numbers?

2. Based on this model, what are the names of three functions defined in the `random` module?

3. Explain the reason for the name errors in the table above.

4. What is the effect on the “random” numbers generated after calling the `seed` method?

5. Describe one reason to set the same seed each time a program is run, and one reason *not* to use the seed method.

6. Run `random.random()` in a shell multiple times. Based on the results, describe:

a) the range of numbers returned by the random function

b) the nature of the distribution of numbers generated. (Do they appear clustered around a particular value, or are they spread out uniformly over the range?)

c) Type `help(random.random)` in the shell to check your answers.

7. Run `random.randint(1, 10)` in a shell multiple times. Based on the results, describe:

a) the range of numbers returned by the randint function

b) the nature of the distribution of numbers generated. (Do they appear clustered around a particular value, or are they spread out uniformly over the range?)

c) Type `help(random.randint)` in the shell to check your answers.

8. Write an if statement to simulate a coin toss. The code should print “Heads!” or “Tails!”, with 50% probability. *Hint:* `random.random()` is less than 0.5 about 50% of the time.

9. Write a statement that generates a random integer between 80 and 100, inclusive, and assigns the integer to a variable named `score`.