7 Set and Tuple

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1. Sets

Defining sets

Sets are another collection/container, like lists, which contain multiple values.

- The **key differences** are
    - **Sets don't hold order**
    - **Sets don't allow duplicate elements**

Set size

- List lists, `len()` returns set size.

`in` Operation

List and set

- Set and list are interchangeable.

2. Set Methods and Operations

`add()` method

`union()` method and `|` operator

`intersetion()` method and `&` operator

`difference()` method and `-` operator

3. Modifying a Set

`remove()` method

`discard()` method

4. Tuple

Defining tuples

```
>>> t = 'a', 'b', 'c', 'd'
>>> t
('a', 'b', 'c', 'd')
```

Slice operator

The slice operator selects a range of elements.

```
>>> t = ('a', 'b', 'c', 'd')
>>> t[0]
'a'
>>> t[1:3]
('b', 'c')
```

Tuples are immutable

- Tuples are immutable, and you cannot modify the elements.

```
>>> t = ('a', 'b', 'c', 'd')
>>> t[0] = 'A'
TypeError: 'tuple' object does not support item assignment
```

5. Tuple assignment

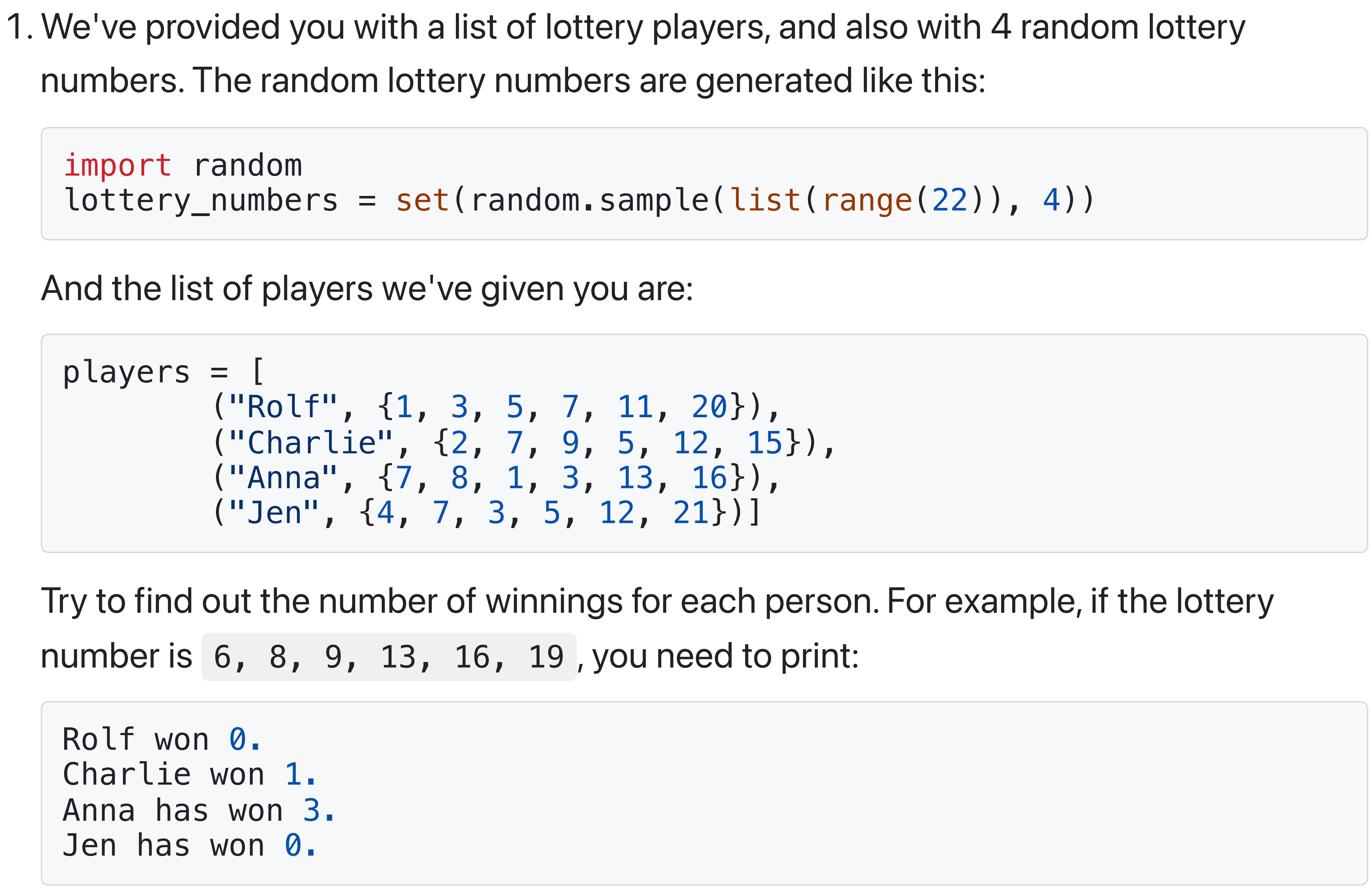
6. Variable-length argument tuples

7. Lists and tuples

`zip()` function

`enumerate()` function

8. Practice questions



1. We've provided you with a list of lottery players, and also with 4 random lottery numbers. The random lottery numbers are generated like this:

   ```
   import random
   lottery_numbers = set(random.sample(list(range(22)), 4))
   ```

   And the list of players we've given you are:

   ```
   players = [
           ("Rolf", {1, 3, 5, 7, 11, 20}),
           ("Charlie", {2, 7, 9, 5, 12, 15}),
           ("Anna", {7, 8, 1, 3, 13, 16}),
           ("Jen", {4, 7, 3, 5, 12, 21})]
   ```

   Try to find out the number of winnings for each person. For example, if the lottery number is `6, 8, 9, 13, 16, 19`, you need to print:

   ```
   Rolf won 0.
   Charlie won 1.
   Anna has won 3.
   Jen has won 0.
   ```

2. Try to create a function, which can take variable-length arguments and return the square root of the arguments.

3. Summary data. Create a function, named `summarize_data`, which takes a list of numbers and returns a tuple containing the minimum, mean, and the maximum values. For example, given `[1, 2, 5]`, it would return `1, 2.6666, 5`
    - You may use some built-in functions, like `sum`, `min`, and `max` .

4. **(Optional)** Letter frequency. Create a function, named `letter_frequency`, which takes a string and prints the letters in the string (case-insensitive, or just use upper case) and corresponding frequency. For example,
    - Given 'Rutgers, RBS', the function would print `[('G', 1), ('U', 1), ('B', 1), ('T', 1), ('R', 3), (',', 1), ('E', 1), ('S', 2)]`

End