1 Exercises

Exercise 1. What is the value and type of each of the following expressions?

a. `"1" + " - " + "1"`

b. `"This parrot would not voom if you put " + str(4) + " million volts through it!"`

c. `"42" * 3`

d. `int("42") * 3`

e. `float("3.14") * 3`

f. `1 - 1 - 1 - 1`

g. `3 / 2 + 2 * 5`

h. `3 // 2 + 2 * 5`

i. `3.14 + int(math.pi) ** 2 % 5`

j. `(3.14 + int(math.pi) ** 2) % 5`

k. `8 <= 2 or 8e2 <= 2e8`

l. `5 + int(stdrandom.uniformFloat(0, 1) * 5)`

Exercise 2. Consider the following program:

mystery.py

```
import stdio
import sys

a = int(sys.argv[1])
b = int(sys.argv[2])
c = int(sys.argv[3])
stdio.writeln(a ** 2 == b ** 2 + c ** 2 or b ** 2 == a ** 2 + c ** 2 or c ** 2 == a ** 2 + b ** 2)
```

a. What does the program write when run with command-line arguments 1, 2, and 3?

b. What does the program write when run with command-line arguments 3, 4, and 5?

c. What does the program write in general?

Exercise 3. Implement a program called `far2cen.py` that accepts f (float) as command-line argument representing the temperature in Fahrenheit, and writes to standard output the Celsius equivalent c of the temperature, calculated as $c = \frac{5}{9}(f - 32)$. How would you run the program on the terminal to convert 42 $°F$ to $°C$?

Exercise 4. Implement a program called `die.py` that accepts n (int) as command-line argument, simulates the roll of an n-sided die, and writes the number rolled to standard output.

2 Solutions

Solution 1.

a. `"1 - 1"` (`str`)

b. `"This parrot would not voom if you put 4 million volts through it!"` (`str`)

c. `"424242"` (`str`)

d. `126` (`int`)

e. `9.42` (`float`)

f. `-2` (`int`)

g. `11.5` (`float`)

h. `11` (`int`)

i. `7.14` (`float`)

j. `2.14` (`float`)

k. `True` (`bool`)

l. A random number from the interval $[5, 10)$ (`int`)

Solution 2.

a. `False`

b. `True`

c. Accepts three command-line arguments a, b, and c as integers and writes `True` if the square of any one of them is equal to the sum of squares of the other two, and `False` otherwise.

Solution 3.

far2cen.py

```
import stdio
import sys

f = float(sys.argv[1])
c = (f - 32) * 5 / 9
stdio.writeln(f)
```

>_ ~/workspace/ipp/programs

```
$ python3 far2cen.py 42
```

Solution 4.

die.py

```
import stdio
import stdrandom
import sys

n = int(sys.argv[1])
result = stdrandom.uniformInt(1, n + 1)
stdio.writeln(result)
```