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:

```python
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.

```
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.

```
import stdio
import stdrandom
import sys

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