You are given seven different programs A, C, E, G, I, K, M, each meant to carry out the same task, where programs C, G, K, M are written in Python and programs A, E, I are written in Java.

1. Suppose that programs C, A, E, I, M are correct and programs G, K are incorrect. For each statement below, say whether the statement is true or false, and give the smallest number of programs that must be tested to verify your claim. Justify each answer.

(a) All Python programs are correct.
   False: test program G (or K) to verify.

(b) Some correct program is written in Java.
   True: test program A (or E, or I) to verify.

(c) Every Java program is correct.
   True: test programs A, E, and I to verify.

(d) Only programs written in Python are incorrect.
   True: test programs A, E, and I to verify.
2. Let \( P \) represent the set of all programs (our “universe” or “domain”), \( J \) represent the set of all Java programs, and \( T \) represent the set of all correct programs.

For each statement in the previous question, draw one Venn diagram representing a situation when the statement is true, and another Venn diagram representing a situation when the statement is false—for this question, ignore all assumptions about the correctness of the programs.

For each statement, we draw one diagram illustrating a situation where the statement is true (on the left), followed by a second diagram illustrating a situation where the statement is false (on the right). Note that in each diagram, regions that do not explicitly contain an element are empty.