You are given seven different programs, with labels A, C, E, G, I, K, M. Each program attepmpts to carry out the same task. Programs C, G, K, M are written in Python, while 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 (not correct). For each statement below, say whether the statement is true or false, and give the *smallest* number of programs that must be checked to verify your claim. Justify each answer.

   (a) All Python programs are correct.

   False: test program G (or K) to show that the statement is false. They are counter-examples to the statement's claim. They disprove the claim.

   (b) Some correct program is written in Java.

   True: test program A (or E, or I) to show that the statement is true. They provide an example that proves the claim.

   (c) Every Java program is correct.

   True: test programs A, E, and I to verify.

   (d) Only programs written in Python are incorrect.

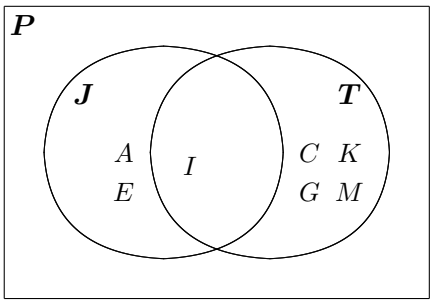
   True: test programs A, E, and I to verify.

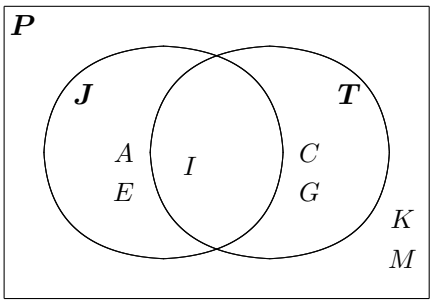
2. Let P represent the set of all programs (our "universe" or "domain"), J represent the set of all *Java* programs, and T represent the set of all *correct* programs.

   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, you may re-use the facts that programs C, G, K, M are written in Python and programs A, E, I are written in Java. But you may want to modify the facts about the correctness of the programs when representing the requested situations.

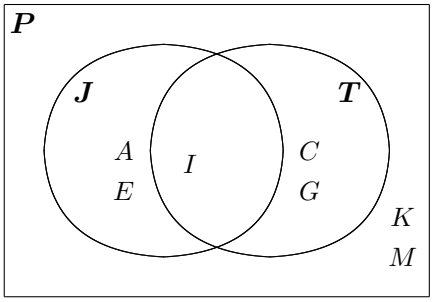
   For each statement, we draw one diagram illustrating a situation where the statement is true (on the left), followed by a second diagram illustrating a situation where the statement is false (on the right). Note that in each diagram, regions that do not explicitly contain an element are empty. Also note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

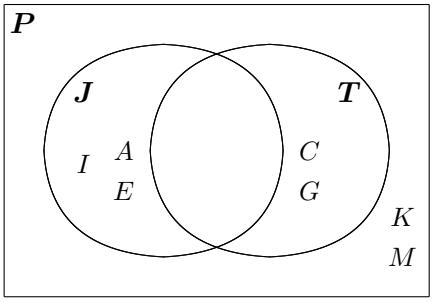
(a)



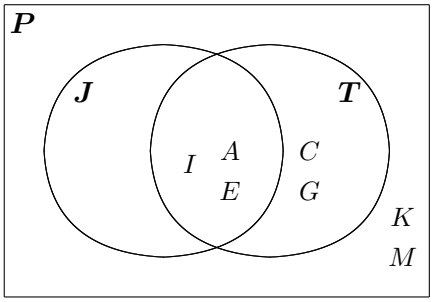


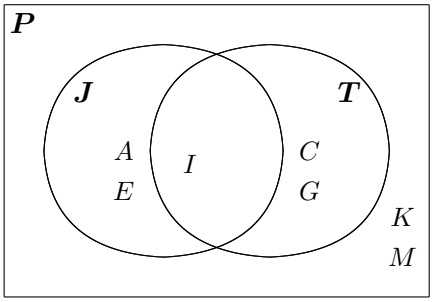
(b)





(c)





(d)