As in Tutorial 1, suppose that 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. 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.
Recall that in class, we have seen how set notation like "$x \in T$" can be expressed in predicate notation as "$T(x)$", and how this can be used to write different sentences symbolically. Make sure that you understand this correspondence well before answering the following questions.

1. For each English sentence below, give representation(s) of the sentence that use the language of symbolic logic. In this course, we prefer that you use quantifiers over the whole universe (in this case P) and then use predicate notation to restrict the domain.

   (a) Some incorrect program is written in Java.

   (b) No Java program is correct.

   (c) Only programs written in Python are incorrect.

   (d) The program is correct and is written in Python.

   (e) If some Java program is correct, then all Java programs are correct.

2. Give a *natural* English sentence that captures the meaning of each symbolic sentence below.

(a) $\exists x \in P, \neg J(x) \wedge T(x)$

(b) $\forall x \in P, \neg J(x) \wedge T(x)$

(c) $\neg \forall x \in P, T(x) \Rightarrow J(x)$

(d) $\forall x \in P, \neg J(x) \Leftrightarrow T(x)$

(e) $\big(\forall x \in P, J(x) \Rightarrow T(x)\big) \vee \big(\forall x \in P, J(x) \Rightarrow \neg T(x)\big)$