| A ***statement*** is a sentence that is either true or false, but not both simultaneously. |
|---|
| The ***negation*** of a true statement is a false statement and the negation of a false statement is a true statement.<br>• The negation of statement p is expressed by writing ~p. We read this as "not p" or "It is not true that p." |

Example 1: Form the negation of each statement:

a. Paris is the capital of Spain.

b. July is not a month.

Example 2: Express each of the following statements symbolically.

Let p and q represent the following statements:
p: Paris is the capital of Spain.
q: July is not a month.

a. Paris is not the capital of Spain.

b. July is a month.

Example 3: Express the symbolic statement ~q in words.

Let q represent the following statement:
q: Chicago O'Hare is the world's busiest airport.

Statements that contain the words *all*, *some*, and *no* are called ***quantified*** statements. Here are some examples:

All poets are writers.
Some people are bigots.
No common colds are fatal.
Some students do not work hard.

**TABLE 3.1** Equivalent Ways of Expressing Quantified Statements

| Statement | An Equivalent Way to Express the Statement | Example (Two Equivalent Quantified Statements) |
|---|---|---|
| All *A* are *B*. | There are no *A* that are not *B*. | All poets are writers.<br>There are no poets that are not writers. |
| Some *A* are *B*. | There exists at least one *A* that is a *B*. | Some people are bigots.<br>At least one person is a bigot. |
| No *A* are *B*. | All *A* are not *B*. | No common colds are fatal.<br>All common colds are not fatal. |
| Some *A* are not *B*. | Not all *A* are *B*. | Some students do not work hard.<br>Not all students work hard. |