**Claim:**

J() correctly returns true if leash L can be used by Pfrog and Qfrog to traverse the pond on points in the sets P and Q.

There are two Base Case’s to consider:

**Base Case 1:**

If the distance from where Pfrog is to where Qfrog is, is greater than L, J() correctly returns false.

**Base Case 2:**

Let m be an arbitrary positive integer that represents the number of points in set P. Let n be an arbitrary positive integer that represents the number of points in set Q. If m is equal to one and n is equal to one, and the distance from where Pfrog is to where Qfrog is, is less than or equal to L by base case 1, J() correctly returns true.

**Inductive Hypothesis:**

Let M and N be arbitrary positive integers

For all M <= m points in set P and for all N <= n points in set Q, J() correctly returns true if leash L can be used to traverse the pond using points P[1..M] and Q[1..N] and returns false otherwise.

**There are 4 cases to consider:**

Both frogs jump to next point

If 1 < M <= m and 1 < N <= n and Pfrog and Qfrog can jump to P[1..M-1] and Q[1..N-1] using leash L, then J() correctly returns true by the inductive hypothesis since M – 1 < m and N – 1 < n.

PFrog jumps to the next point and Qfrog stays

If Qfrog remains at Q[1..N] and Pfrog can jump to P[1..M-1] where 1 < M <= m using leash L, then J() correctly returns true by the inductive hypothesis since M – 1 < m and n <= n.

Pfrog stays and Qfrog jumps to the next point

If Pfrog remains at P[1..M] and Qfrog can jump to Q[1..N-1] where 1 < N <= n using leash L, then J() correctly returns true by the inductive hypothesis since M <= m and N – 1 < n.

None of the above cases are true

J() returns false by Inductive Hypothesis (IH)