Write a loop invariant for the **Partition** function, and then prove that the partition procedure is correct by showing that the loop invariant holds for initialization, maintenance, and termination.

1. **Loop invariant** (write a statement that can be easily proven true or false, that references the purpose of the loop, and references variables that change each iteration):

2. **Initialization** (show that the loop invariant is true before the loop starts):

3. **Maintenance** (show that the loop invariant holds when executing any iteration):

4. **Termination** (show that the loop invariant holds once the loop ends):