HW6 Reflection

For the entire homework set, make sure to also include:
- a reflection on the assignment and your solutions. Reflections may include
· discussion of how routine or challenging the assignment was,
· approximation of time spent on the assignment or on individual exercises,
· details about particular difficulties or false starts,
· explanations of why solutions are incomplete or incorrect, etc.
- a self-assessment (C/R/M) for the entire assignment.

There are two different definitions for continuity that we learned this semester. The first definition surrounds the concept of metric spaces, and goes as follows:

A function $f: X \to Y$ *from one metric space to another is continuous at* p *if for all* $\epsilon > 0$, *there exists* $\delta > 0$ *such that*

$$d_X(x,p) < \delta \to d_Y(f(x),f(p)) < \epsilon.$$

$$d_X(x,p) < \delta \to d_Y(f(x),f(p)) < \epsilon.$$

This is the definition that I used to solve the exercises for this homework. However, as we learned there is another definition for continuity:

A function $f: X \to Y$ *from one topological space to another is continuous if* $f^{-1}(V)$ *is an open set in* X *for every open set* V *in* Y.

Both definitions are useful; the first definition associates continuity with distances and their related notions of closeness, whereas the second definition associates continuity with an inherent relationship between the properties of two topologies; that is, open sets in one space correspond to open sets in another.