HomeWork #4

2018320161 컴퓨터학과 송대선

1. How can we define P vs NP problem?

Literally, P vs NP means that the "real" world that we live in has a property whether P=NP or P$\neq$NP.

P vs NP problem is also about the relationship between two classes such that the class of efficiently solvable problems and the class of efficiently verifiable problems.

We can conclude P vs NP problem as P=NP or P$\neq$NP.

If P = NP, then efficiently solvable problem can be efficiently verifiable, which is generally true, and efficiently verifiable problem can be efficiently solvable.

If P$\neq$NP, then there exists at least one efficiently verifiable problem that can not be solvable efficiently.

2. Represent worlds that P=NP(world A) and P$\neq$NP(world B) as a directed graph
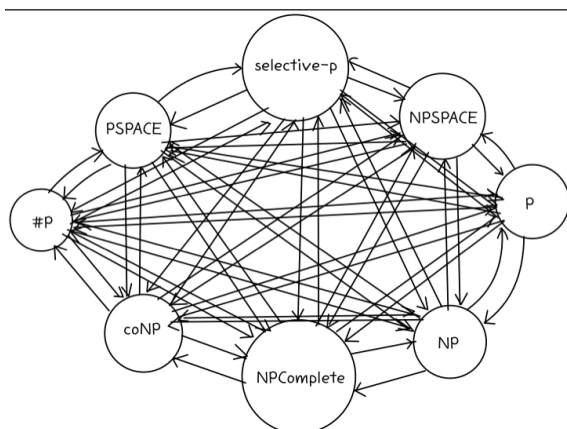
The World A
every nodes are fully connected each other,
and every edges mean subset relationships
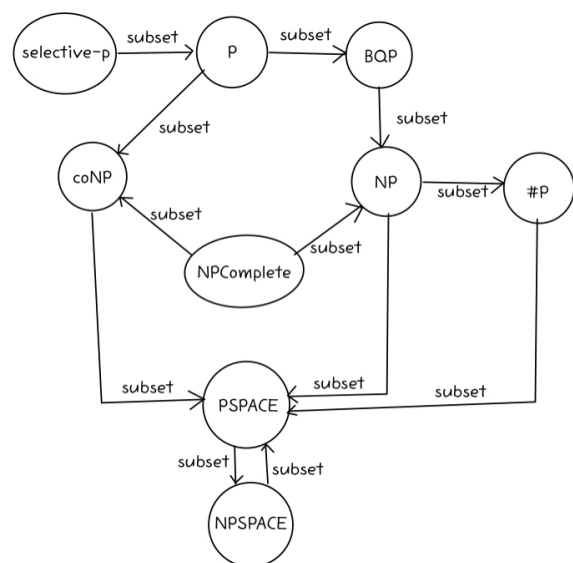
The World B

3. What are structural differences between A and B?

In the world B, there exists meaningful structure of subset relations between various classes,

but in the world A, every classes become the only one class because subset relationships with each other result in an equivalent relationship.

So there is no difference between any classes in the world A.