<Homework #3>

2018320161_컴퓨터학과_송대선

Problem 1)

(PATH, complement of PATH) is a member of the subset.

PATH and complement of PATH is reducible each other just by flipping its output.

We can build a program "K" that takes a problem and returns reverse of the input problem.

If we give PATH as an input of "K",

then output of "K" is same as output of complement of PATH

If we give complement of PATH as an input of "K",

then output of "K" is same as output of PATH

(Traveling Salesman Problem, Hamiltonian Cycle Problem) is a member of the subset.

Traveling Salesman Problem and Hamiltonian Cycle Problem are both in NP-Complete class. So, both problems are reducible to each other.

Problem 2)

Following structure is the logical structure of A.

① ↔ ⑤

⑱ ↔ ⑫ ↔ ⑯ → ⑲

⑮ → ⑪

⑥ ∧ ⑪ → ⑨

⑥ ↔ ⑩

㉑ ↔ ⑬

We can drive new proposition from 2 and 15 such that

"PATH belongs to a subset of the intersection of NP and coNP"

We can drive new proposition from 15 and 18 such that

"Proof checking belongs to a subset of the intersection of NP and coNP"