# HomeWork #5

## 2018320161 컴퓨터학과 송대선

### 1. Select any 5 theorems that we have addressed so far and enumerate them

1. if P=NP, then solving and verifying are not significantly different in terms of "hardness"
2. Incompleteness Theorem
3. if SAT belongs to P, then every problem in NP can be solvable efficiently
4. Recursive Theorem
5. All language in BPP have polynomial circuits

### 2. What is the most important theorem that you think?

1. if P=NP, then solving and verifying are not significantly different in terms of "hardness"

### 3. Explain the reason why you think so.

if P=NP, then this world is a computational utopia(Algorithmica)

We can automate various tasks that currently require significant creativity:

engineering, programming, mathematics, writing, composing, painting, ... extra.

As a programmer, Algorithmica is wonderful world that I can ever imagine!

### 4. Select 5 issues/subjects/concepts/definitions etc addressed in this class that you want me to review, or re-explain

1. AV-mathematics의 정의가 헷갈립니다

   주어진 text가 증명인지 아닌지를 증명하는 Theory인가?

   아니면 text의 증명이 합당한지를 증명하는 Theory인가?

2. K = {f(0), f(1), f(2), ...} 는 not computable, n $\notin$ K이면 computable?
   → not computable하다는 것의 정의가 헷갈립니다.

3. Incompleteness Theorem의 증명이 이해가 잘 가지 않습니다.

   theorem of $\mathcal{F}$의 관점으로 보면, $C_K(n) = 1$이 되고,

   $P_n$의 관점으로 보면 $C_K(n) = 0$이라서 모순인 것입니까?

4. Richard Lipton의 possible proof that P=NP가 잘 이해되지 않습니다.

5. binary tree가 different한지의 여부를 판단하는 알고리즘을 다시 review하고 싶습니다.