

COT 4210 Quiz #4 Part B: Class NP 4/22/2021

Regular Start Time: 2:10 pm (EST)

Regular End Time: 2:50 pm (EST)

Regular Late Time: 3:00 pm (EST)

1) (10 pts) Let $4COLOR = \{ \langle G \rangle \mid G \text{ is colorable with 4 colors.} \}$. It can be proven that FOUR-COLOR is an NP-Complete language.

Specifically, we can show that $3COLOR \leq_P 4COLOR$. One the reduction is shown, the results follows.

For this question, show the polynomial time reduction between the two problems. (Hint: This reduction isn't as difficult as it may initially seem.)

2) (5 pts) The same device used to do the reduction in question 1 can be used to show that $2COLOR \leq_P 3COLOR$. But, even if this reduction is successfully done, it does NOT prove that $2COLOR$ is NP-Complete. Why?

3) (5 pts) Let the language $UNEVENPART = \{ \langle S, x, y \rangle \mid S \text{ is a set of positive integers such that a subset } T \text{ of } S \text{ sums to } x \text{ and the set } S - T \text{ sums to } y \}$

Prove that $UNEVENPART$ is NP-Complete.

4) (5 pts) In what city is Orlando International Airport?