CS 241 Homework 2

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Instructions

- The learning objective for this assignment is to ensure that you understand the underlying material, and to provide you with practice in solving problems of this kind.
- Only a few of these problems will be graded. You do not know beforehand which ones these are; hence, you should provide solutions to all the problems.
- Make your solutions concise and formal.
- Please type the assignment if your handwriting is difficult to read. Otherwise scan to pdf
- You are encouraged to work on problems in groups. List the people you worked in groups with please. If you used an online resource i.e. Math-Stack Exchange, link the question asked or resource such that I can check you understand rather then brain-off copying
- Note that you must write your solutions by yourself, in your own words. Individual submissions
- **Remember that proving a statement is false counts as proving the statement. To prove a statement you do not need to prove it true**

Problems

Extra Credit: All assignments must be uploaded to Canvas as a pdf. Should you type up your homework in Latex, I will give you +2 extra credit points (equivalent to 10%). Template file will be provided if you want

Problem 2.1. *For each of the following theorems P, write the negation $\overline{P}$. Remember that by definition one of these statements is true. Prove the true version.*

Let $a, b, c > 0$ be integers. Let e_1, e_2 be even numbers and d be an odd number.

Theorem 2.1. $\forall e_1, e_2, e_1 \cdot e_2$ *is even*

Theorem 2.2. $\exists d, e \,|e^d$ *is odd*

Theorem 2.3. $\forall a, b \,\exists c \,|a^2 \cdot b^2 = c^2$

Theorem 2.4. $\exists c \forall a, b \,|a^2 \cdot b^2 = c^2$