

## CSC 231 WEEK 3 QUIZ STUDY GUIDE

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First order predicate logic: meaning of “predicate”; difference between first order logic and second-order logic. You are assumed to understand the material in chapters 1, sections 1.1 through 1.6, from your studies in CSC 230, so you should be prepared to answer questions from that section.

You should be able to define the concept of *program invariant*, and be able to use this concept to prove correctness of simple algorithms/ pieces of code. Refer to examples given in lecture: such as verification of an algorithm to sum an array.

Understand and be able to state definitions for the following concepts: basic step or basic operation, Big  $O$ , Big  $\Omega$ , Big  $\Theta$ . Be able to do simple proofs to show that a function is in one of these three complexity classes.

Understand and be able to state definitions of: worst case complexity function, average case complexity function, polynomial time algorithm, decision problems, the problem classes  $P$  and  $NP$ , the notion of an NP complete problem, The Satisfiability problem SAT.

Be able to state possible practical applications of combinatorial problems such as Vertex Cover, Clique, Independent Set, and Hamiltonian Circuit.

Be able to solve simple counting problems that involve the number of subsets or permutations of a set.

Be able to problems such as those assigned in Homeworks 1 and 2.