CMP 101 Handout #2
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Written Assignment 1

Due at the start of class, Thursday Oct. 8

On your assignment please clearly identify both your name and your cats (athena) account. For questions 1 through 5, give the most exact, closed form answer you know. Also give the best asymptotic (Big "O") notation for this questions. This problem set is a warm-up and will count less than the other written homeworks.

1. (2 pts) $\sum_{i=0}^{k} i =$

2. (2 pts) $\log_2(4i^3) =$

3. (2 pts) What is the maximum number of edges in a simple undirected graph of n nodes (i.e. the complete graph on n nodes)?

4. (2 pts) $\sum_{i=j}^{k} 2^i =$

5. (5 pts) Use calculus to get a good upper bound on $\sum_{i=1}^{k} \log_2 i$. (Hint: consider converting to ln and bounding that.)

6. (7 pts) Consider a linked list of integers ADT where the mathematical model is a sequence of integers with a current position. Define operations and access functions (like *push*, *pop*, *topOf*, and *isEmpty* for the stack in the ADT handout) that provide the functionality of lists. For each operation/function give a meaningful name, a description of the operation performed or value returned, and any preconditions that must be satisfied. For example, you might have a *moveNext* operation that moves the current position to the next element of the sequence and has the precondition "not *atEnd*".