

# CSC 400 Estimation Questions

September 4, 2009

Document your sources and describe your reasoning and assumptions in answering the following questions. For uncertain quantities, it is wise to consult more than one source. Do your own calculation rather than looking up the answers (which might very well be wrong).

1. If you were sealed in your office with no source of fresh air, how long would it take for the air to become unbreathable due to carbon dioxide accumulation? What about for a fully loaded 747 jetliner?
2. What is the total length of the hairs on a typical sheep? If all the hairs on all the sheep in the world were placed end to end, how far would it reach? Could you run a thread to Mars?
3. How many (nutritional) (kilo)calories per acre/hectare per year can be produced if you are using (good) farmland to produce wheat? rice? beef?. How many people could that acre/hectare support in terms of caloric requirements in each case?
4. If we were to attempt to replace all gasoline used in the US with corn-based ethanol, how much farmland would be required to grow the necessary corn (assuming current technology)? What fraction of total US farmland would this represent?