**Name: Session:**

**A Programming Puzzle**

Solve this problem in the language of your choice. When you have found the solution, print out your source code, attach it to this sheet, and turn in. Be sure to answer the two questions at the end of this chapter. **This is due at the end of the session today. Late submissions will not be accepted.**

You have a 1 inch cube of butter. Your task is to spread it over the entire football field. Assume the football field is 360 feet by 160 feet. You will cover the field by bisecting each face of the cube of butter to create 8 smaller cubes. You will repeat the process iteratively until you cover every square inch of the football field. For example, in the beginning, the cube will cover 1 square inch. After the first iteration, you will have 8 cubes with a side of ½ inch which cover ¼ square inches each thus 8 cubes will cover 2 square inches (8 \* ¼). After the second iteration you will have 64 cubes each with a side of ¼ inch which cover 1/16 inches. 64 cubes will therefore cover 4 square inches. You have the option of continuing this process longhand until the problem is solved or you may write a computer program to iteratively solve this problem. You solution must provide the answer to two questions.

1. How many cubes do you end up with?
2. What is the dimension of the final set of cubes (i.e. How think is the butter spread on the field in nanometers?)?