CS 121 SI Week 12 Worksheet - Inheritance

**Syntax Questions:**

1. Given the following two classes,

class Parent {

public: int pub1, pub2, pub3;

protected: double pro4, pro5;

private: char pri6;

};

class Child : \_\_\_\_\_\_\_ Parent {

public: bool pub7;

protected: long pro8;

private: float pri9;

};

assume that the below specifications (public, protected, private) are for the Child class's inheritance. Under each specification, what members would Child have (inherited and its own) and what would their access types be?

- public:

- protected:

- private:

2. Write up a recursive function to solve for the *number-raised-to-a-power* problem, that is:

, where:

- The function takes two inputs (base *m* and power *n*)

- m is any integer and n is an integer 0 .

**BONUS:** Rewrite the above recursive function to allow negative powers too (i.e. n is any integer).

**Concept Problems:**

1. In the videogame *Halo: Combat Evolved*, there were three major enemy factions: The Covenant, the Flood, and the Sentinels. The Covenant consisted of four enemy types: Grunts, Elites, Jackals, and Hunters. The flood consisted of three types: Infection, Combat, and Carrier. Thirdly, Sentinels only came in a robotic form. Design what the enemy class hierarchy looks like, using boxes for classes and arrows to indicate inheritance.

**BONUS:** Using your above design, how would you make a vector that allowed *any* type of enemy to be added to that same vector (i.e. a list of enemies that has all three types together)?

2. In what scenario would using protected inheritance be useful? What about private inheritance?