1. State whether each of the following is true or false. If false, explain why.

(1) Base-class constructors are not inherited by derived classes.

→TRUE.

(2) An is-a relationship is implemented via composition.

→FALSE. An is-a relationship is implemented via inheritance.

(3) A Student class has an is-a relationship with the Faculty and Course classes.

→FALSE. A Student class has a has -a relationship with the Faculty and Course classes.

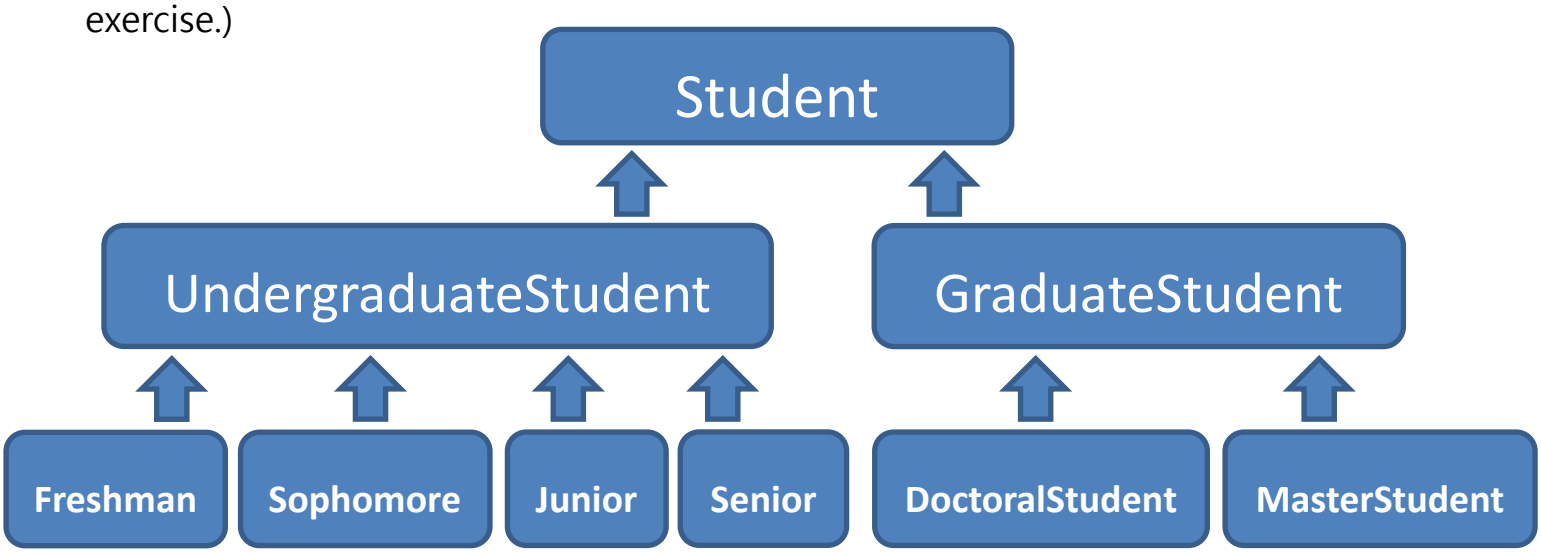
(4) Private members of a private base class are inaccessible to the derived class.

→TRUE.

(5) A base class' s protected members can be accessed in the base-class definition, in derived-class definitions and in friends of the base class and its derived classes.

→TRUE.

2. Draw an inheritance hierarchy for students at a university. Use **Student** as the base class of the hierarchy, then include classes **UndergraduateStudent** and **GraduateStudent** that derive from **Student**. Continue to extend the hierarchy as deep (i.e., as many levels) as possible. For example, **Freshman**, **Sophomore**, **Junior** and **Senior** derive from **UndergraduateStudent**, and **DoctoralStudent** and **MasterStudent** derive from **GraduateStudent**. After drawing the hierarchy, discuss the relationships that exist between the classes. (Note: You don' t need to write any code for this exercise.)



Each arrow in the hierarchy represents an **is-a** relationship.

Freshman, **Sophomore**, **Junior** and **Senior** are **UndergraduateStudent**s, while **DoctoralStudent** and **MasterStudent** are **GraduateStudent**s.

And both **UndergraduateStudent** and **GraduateStudent** are **Student**s.