Homework 11
Inheritance and Polymorphism

TRUE/FALSE

1. New attributes and methods may be added to a subclass.

   ANS:

2. One problem with using a UML diagram is that there is no way to indicate inheritance.

   ANS:

3. When a class inherits another class, it is required to use all the data attributes and methods of the superclass.

   ANS:

4. Polymorphism works on any two class methods that have the same name.

   ANS:

5. A superclass inherits attributes and methods from its subclasses without any of them having to be rewritten.

   ANS:

6. A subclass may not override any method other than the **`__init__`** method.

   ANS:

7. Each subclass has a method named **`__init__`** that overrides the superclass's **`__init__`** method.

   ANS:

8. In a UML diagram depicting inheritance, you only need to write the name of the subclass.

   ANS:

9. An "is a" relationship exists between a grasshopper and a bumblebee.

   ANS:

10. An "is a" relationship exists between a wrench and a tool.

    ANS:

MULTIPLE CHOICE

1. _____ allows a new class to inherit members of the class it extends.

   a. Encapsulation
   b. Attributes
   c. Methods
   d. Inheritance

   ANS:

2. What gives a program the ability to call the correct method depending on the type of object that is used to call it?

   a. Polymorphism
   b. Inheritance
   c. Encapsulation
   d. Methods

   ANS:

3. What does a subclass inherit from a superclass?

   a. instances and attributes
   b. objects and methods
   c. methods and instances
   d. attributes and methods

   ANS:

4. In a UML diagram, what does the open arrowhead point to?

   a. the superclass
   b. the subclass
   c. the object
   d. a method

   ANS:

5. When there are several classes that have many common data attributes, it is better to write a(n) _____ to hold all the general data.

   a. superclass
   b. subclass
   c. object
   d. method

   ANS:

6. In an inheritance relationship, what is a specialized class called?

   a. a superclass
   b. a subclass
   c. an object
   d. an instance

   ANS:

7. Base classes are also called

a. superclasses
b. derived classes
c. subclasses
d. class instances

ANS:

8. What is the relationshop called in which one object is a specialized version of another object?

a. parent-child
b. node-to-node
c. is a
d. class-subclass

ANS:

9. _____ has the ability to define a method in a subclass and then define a method with the same name in a superclass.

a. Inheritance
b. Encapsulation
c. Polymorphism
d. the 'is a' relationship

ANS:

10. In the following line of code, what is the name of the subclass?

```
class Rose(Flower):
```

a. **Rose**
b. **Flower**
c. **Rose(Flower)**
d. None of these

ANS:

11. In the following line of code, what is the name of the base class?

```
class Python(Course):
```

a. **Python**
b. **Course**
c. **Python(Course)**
d. None of these

ANS:

12. Given the following line of code, in a UML diagram, what would the open arrowhead point to?

```
class Celery(Vegetable):
```

a. **Celery**
b. **Vegetable**
c. **class**
d. **Celery(Vegetable)**

ANS:

13. Of the two classes, **Cherry** and **Flavor**, which would most likely be the subclass?

a. **`Cherry`**
b. **`Flavor`**
c. either one
d. neither; these are inappropriate class or subclass names

ANS:

14. Which method can you use to determine whether an object is an instance of a class?

a. **`isinstance`**
b. **`isclass`**
c. **`isobject`**
d. **`issubclass`**

ANS:

15. Which of the following is the correct syntax for defining a class, **`table`**, which inherits from the **`furniture`** class?

a. **`class furniture[table]:`**
b. **`class table.furniture:`**
c. **`class furniture(table):`**
d. **`class table(furniture):`**

ANS:

16. Given the following beginning of a class definition for a superclass named **`clock`**, how many accessor and mutator methods will be needed to complete the class definition?

```
class clock:
    def __init__(self, shape, color, price):
        self._shape = shape
        self.color = color
        self.price = price
```

a. 1 mutator, 1 accessor
b. 3 mutator, 4 accessor
c. 3 mutator, 3 accessor
d. 4 mutator, 5 accessor

ANS:

COMPLETION

1. _____ allows subclasses to have methods with the same names as methods in their superclasses.

ANS:

2. The _____ function determines whether or not an object is an instance of a specific class or an instance of a subclass of that class.

ANS:

3. A subclass is also called a(n) _____ class.

ANS:

4. A superclass is also called a(n) _____ class.

   ANS:

5. When a subclass method has the same name as a superclass method, the subclass method _____ the superclass method.

   ANS:

6. In an inheritance relationship, the extended class is called the _____.

   ANS:

7. New attributes and methods may be added to a subclass which makes it a(n) _____ version of the superclass.

   ANS:

8. In an inheritance relationship, a minivan can be thought of as a(n) _____ of the vehicles class.

   ANS:

9. The term _____ refers to an object's ability to take different forms.

   ANS:

10. In a UML diagram, a line with an open arrowhead from a subclass to a superclass indicates _____.

    ANS: