Solutions to Review for First Exam

CMPSC 111
Introduction to Computer Science I
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1. [True or false:] UML provides a way to diagram classes and the relationships between classes.
   TRUE

2. [Multiple Choice:] In the class which models a student, which of these is an attribute?
   (a) head
   (b) advisor
   (c) age
   (d) parent
   “age” is an attribute; “head” is a component; “advisor” and “parent” are peer objects.

3. [Multiple Choice:] In the class which models a cat, which of the following is a peer object?
   (a) catColor
   (b) catToy
   (c) scratch
   (d) whiskers
   “catToy” is a peer object; “catColor” is an attribute; “whiskers” is a component; “scratch” is a capability.

4. [Multiple Choice:] Names that you choose for your classes, properties, and capabilities are called:
   (a) keywords
   (b) identifiers
   (c) instances
   (d) comments
   IDENTIFIERS

5. [Multiple Choice:] Capabilities are implemented in Java using:
   (a) instance variables
   (b) properties
   (c) keywords
6. Using UML write a class box for a `PlayingCard`, where the `PlayingCard` has two instance variables — `_suit` of type `Suit` and `_value` of type `Value` — and three capabilities: a constructor with no parameters; a method named `getSuit`, which returns a `Suit`; and a method named `getValue`, which returns a `Value`.

```
+--------------------------------+  
| PlayingCard |  
+--------------------------------+  
| _suit: Suit  
| _value: Value  
+--------------------------------+  
| PlayingCard()  
| getSuit(): Suit  
| getValue(): Value  
+--------------------------------+  
```

7. [True or False:] Actual parameters are the working names for details that will be filled in later.

   FALSE – Actual parameters are the values that get filled in for these working names (which are called “formal parameters”)

8. [True or False:] A class can have only one constructor.

   FALSE.

9. [Multiple Choice:] The purpose of which method is to change the value of an instance variable during the lifetime of the instance variable?

   (a) constructor
   (b) mutator
   (c) accessor
   (d) assignment operator

   MUTATOR

10. [Multiple Choice:] Which of the following is not true about primitive data types?

   (a) A primitive data type is not an object.
   (b) You can not pass messages to a primitive data type.
   (c) You create a new instance of a primitive data type using the keyword new.
   (d) The names of the primitive data types are keywords.

   (c) You can NOT use “new” to create a primitive object.
11. What is the purpose and syntax of the return statement?

The purpose is to return from a method. If the method’s return type is Type then the format of the return statement is “return value;”, where value is a value of type Type. (NOTE: it is legal to use a return statement in a void function; in this case the syntax is “return;” — no value is provided.)

12. What is the difference between the scope and the lifetime of a variable?

We discussed this in class. “Scope” refers to the portion of a Java program in which a variable may be used (thus, the scope of a local variable is just the method or set of curly braces in which it is declared, from the point of declaration on to the end of the procedure or enclosing curly braces.)