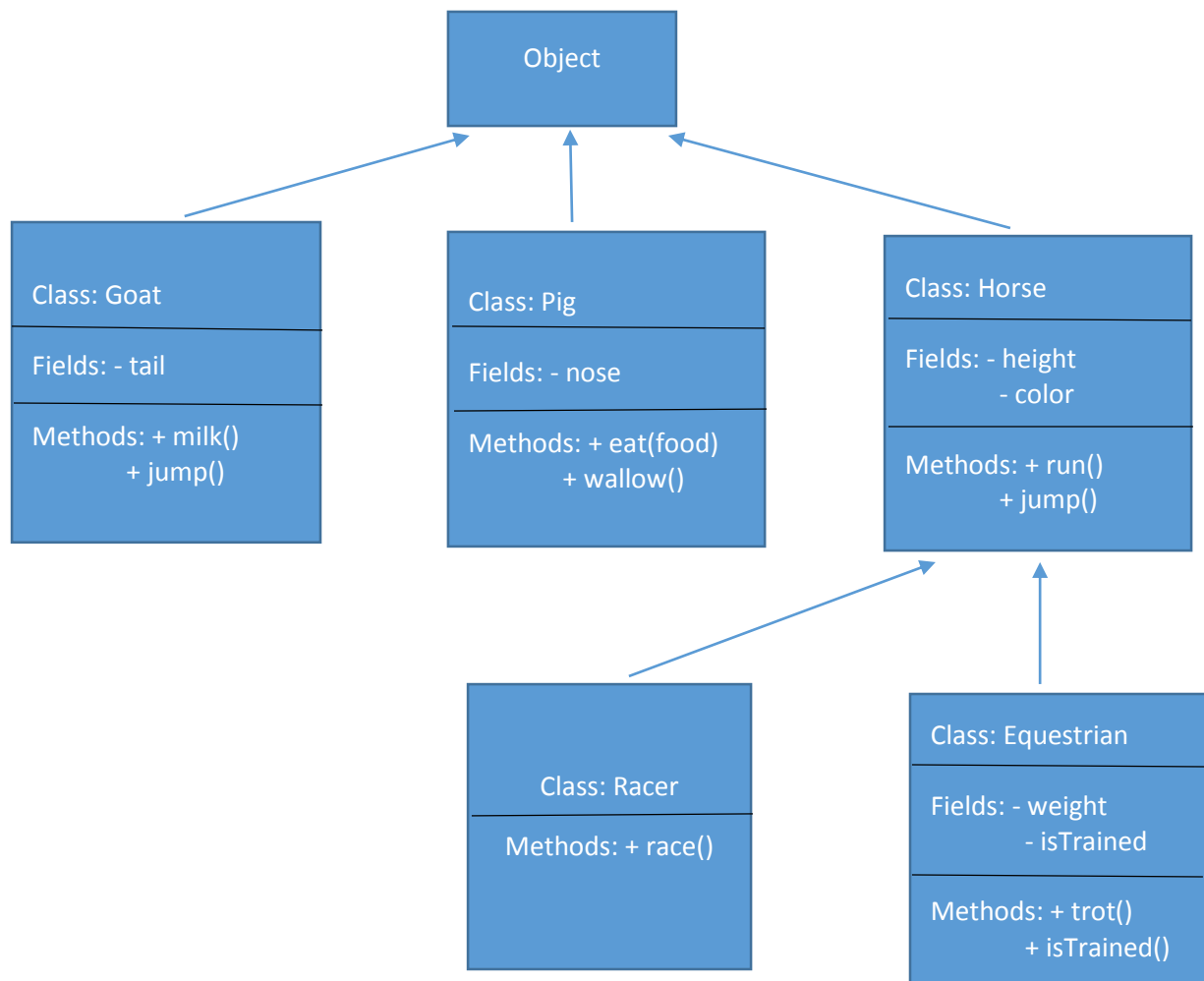


Questions

1. The difference between protected classes and private classes is their access level. The access level for a protected class is class, package, and subclass. The access level for a private class is just within its own class.
2. An interface can be implemented by a regular class, it has no constructor, no instance field, but can have static final field. An abstract class can be extended by a regular class and can have instance fields.
3. Multiple inheritance is allowed for interfaces but not for classes in Java. The reason for this rule is that interfaces do not define fields or method bodies, yet classes typically do. Thus, if Java were to allow multiple inheritance for classes, there could be a confusion if a class tried to extend from two classes that contained fields with the same name or methods with the same signatures. Since there is no such confusion for interfaces, and there are times when multiple inheritance of interfaces is useful, Java allows interfaces to use multiple inheritance.
- 4.



5. A Composition is having an instance of another class as a field of current class, instead of extending it like the Inheritance. Composition is using instance variable that are reference to other objects. In inheritance, one change to the superclass can ripple out and require changes in many other places. It is easier to change the interface of a composition than an inheritance. Inheritance come with polymorphism, so it's easy to add new subclasses.

6. Arrays:

Disadvantages: size is fixed, resizing is expensive. Insertions and Deletions are inefficient: Elements are usually shifted. Sequential access is faster (Reason: Elements in contiguous memory locations).

Advantages: Random access i.e., efficient indexing. No memory waste if the array is full or almost full; otherwise may result in much memory waste.

Linked list:

Advantages: Dynamic size. Insertions and Deletions are efficient: No shifting. Since memory is allocated dynamically(acc. to our need) there is no waste of memory.

Disadvantages: No random access. Not suitable for operations requiring accessing elements by index such as sorting. Sequential access is slow (Reason: Elements not in contiguous memory locations).

References

Fung, Carol. "Linked List." Lecture.

Goodrich, Michael T., and Roberto Tamassia. Data Structures and Algorithms in Java. New York: John Wiley, 2014. Print.