Polymorphism Quiz

Polymorphism

What does the *word* 'polymorphism' mean?

Polymorphism allows an object to take on many forms and perform an action in different ways.

What does it mean when we apply polymorphism to OO design? Give a simple Java example.

It is mostly used in OOP when a parent class is used to inherit properties to a child class. For example, a parent class named Animal can have children classes such as Bear or Spider which share a common method called eyes. Both classes have eyes but have a different number.

public class Bear extends Animal{

What can we use to implement polymorphism in Java?

We can implement polymorphism by using use abstract classes (inheritence) and/or interfaces.

How many 'forms' can an object take when using polymorphism?

As many or as little as required

Give an example of when you could use polymorphism.

Example in question 2.

Composition

What do we mean by 'composition' in reference to object-oriented programming?

Composition are the individual classes that together make a program eg. A car has wheels, an engine, doors and colour. All of these individual pieces make a whole car.

When would you use composition? Provide a simple example in Java.

import behaviours.IEngine;

public class Car extends Vehicle implements IEngine{

What is/are the advantage(s) of using composition?

- Gets around the issue that Java only allows you to inherit from one class at a time
- Doesn’t break encapsulation when reusing code

- Composition makes for more flexible coding

What happens to the behaviours when the object composed of them is destroyed?
All behaviours which are owned by the object are also destroyed eg. When the car is destroyed, so are the wheels, engine and doors.