Reading assignment – Lab 03

1. *What are the advantages of Polymorphism?*
   - *A single piece of code can be reused for different types of objects.*
   - *The system can be flexibly extended to accommodate multiple object classes without significant modifications to existing source code.*
   - *Since processing logic can reside in specific subclasses, maintenance only requires modifications to be made at the relevant class level.*
   - *Common interfaces or methods can be implemented differently across multiple classes.*
2. *How is Inheritance useful to achieve Polymorphism in Java?*
   - *Inheritance allows subclasses to inherit attributes and methods from parent classes. This enables subclass instances to be treated as instances of their parent class.*
   - *Inheritance provides the foundation for method overriding in subclasses, a core polymorphism technique where subclasses can provide their own implementation of inherited methods.*
   - *A parent-class variable can reference child-class objects, creating polymorphic behavior where the same reference type can exhibit different behaviors based on the actual object type.*
3. *What are the differences between Polymorphism and Inheritance in Java?*

Polymorphism	Inheritance
A single object can take multiple forms	A child class inherits properties and methods from a parent class
Enables different behaviors for different object classes while maintaining a consistent interface	Aims for code reuse and hierarchical organization of classes
Requires inheritance to be implemented	Can exist without polymorphism being applied
Achieved through method overriding and interfaces	Achieved through the extends keyword in Java
Focuses on runtime behavior variation	Focuses on compile-time structure and relationships
Example: Animal sounds - each animal makes different sounds	Example: Dog inherits common traits from Animal class