Reading Assignment:

- 1. What are the advantages of Polymorphism in OOP?

Polymorphism allows objects to be treated as instances of their parent class rather than their actual class. This has several advantages:

1. Code Reusability: You can write general code that works on the superclass, and it will automatically work for all subclasses.

2. Flexibility & Maintainability: You can easily change parts of the program without modifying the whole codeb

ase.

3. Extensibility: New subclasses can be added with little or no modification to existing code.

4. Dynamic Behavior: With method overriding (runtime polymorphism), the right method is called based on the object's actual class at runtime.

5. Cleaner Code: Avoids long `if-else` or `switch` statements for behavior based on object types.

- 2. How is Inheritance useful to achieve Polymorphism in Java?

Inheritance is the foundation for polymorphism. Here's how:

In Java, a subclass inherits methods and properties from a superclass.

You can then override methods in the subclass to provide specific behavior.

When you use a superclass reference to refer to a subclass object, Java uses dynamic method dispatch to determine which method to call at runtime.

- 3. What are the differences between Polymorphism and Inheritance in Java?

Feature	Inheritance	Polymorphism
Definition	Mechanism for a class to inherit behavior and properties from another class.	Ability of different classes to be treated as instances of the same class through a common interface
Purpose	Code reuse; establishing relationships	Code flexibility; dynamic behavior at runtime.
Usage	`extends` keyword (for classes), `implements` (for interfaces).	Method overriding (runtime), method overloading (compile-time).
Type	Is a structural concept.	Is a behavioral concept.
Dependency	Inheritance can exist without polymorphism.	Polymorphism depends on inheritance.
Relation	"is-a" relationship (Ex. Dog is an Animal).	"behaves like" or "can be used as" a parent type.