

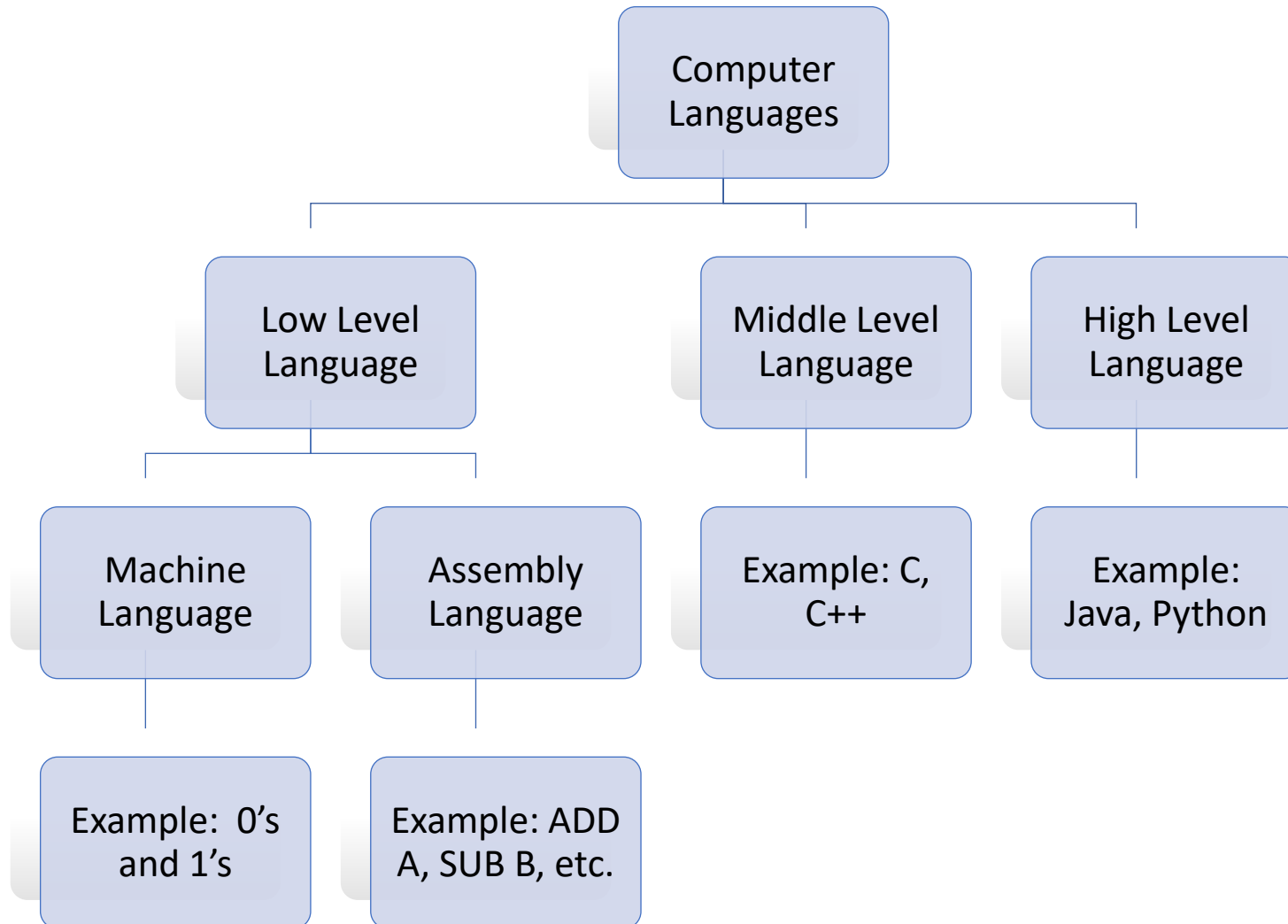
Lecture: 1

Introduction

Sub: Object Oriented Programming

Code: CSE-1205

Programming Language



Structured Programming

- It is about writing procedures or functions that perform operations on the data,
- Disciplined approach to writing programs
- Usually middle level language
- Clear, easy to test and debug and easy to modify
- Example : C

Object-Oriented Programming (OOP)

- Object-oriented programming is about creating objects that contain both data and functions.
- **Reusable** software components that model items in the real world
 - Meaningful software units
 - Date objects, time objects, paycheck objects, invoice objects, audio objects, video objects, file objects, record objects, etc.
 - Any noun can be represented as an object
- More **understandable**, better **organized**, and easier to **maintain** than procedural programming
- Example : C++, Java

Structured vs OOP

Structured	Object Oriented Programming
Programs are divided into small programs or functions.	Programs are divided into objects or entities.
It is all about facilitating creation of programs with readable code and reusable components.	It is all about creating objects that usually contain both functions and data.
Its main aim is to improve and increase quality, clarity, and development time of computer program.	Its main aim is to improve and increase both quality and productivity of system analysis and design.
It generally follows “Top-Down Approach”.	It generally follows “Bottom-Up Approach”.
Methods are written globally and code lines are processed one by one i.e., Run sequentially.	Method works dynamically, make calls as per need of code for certain time.
It is more difficult to modify structured program and reuse code as compared to object-oriented programs.	It is less difficult to modify object-oriented programs and reuse code as compared to structured programs.

Features of OOP vs Structured Programming

1. Data Abstraction

In structured languages, data abstraction or hiding is achieved through only local and global variables, whereas in object-oriented languages, a higher degree of data abstraction is achieved through the uses of objects and access modifiers.

Features of OOP vs Structured Programming

2. Polymorphism

- ❑ In object-oriented languages, an object can get its general attributes from its parent through a mechanism called 'inheritance', without copying and editing the code of the parent object.
- ❑ But in case of structured languages, this cannot be done without copying and editing huge amount of code, and thus leaving a great scope for making mistakes.

Features of OOP vs Structured Programming

3. Inheritance

- ❑ In object-oriented languages, a single named method can be used to operate on different types of data, which is known as 'polymorphism'.
- ❑ However, in structured languages, differently-named methods are needed to operate on different types of data, thus bearing the stress of remembering more than one names for a single job.

Java – An Example of OOP

- Developed by Sun Microsystems (James Gosling)
- Originally called **“Oak”**
- Java, May 20, 1995, Sun World
- A general-purpose object-oriented language
- Based on C/C++
- Designed for easy Web/Internet applications
- Widespread acceptance

Why Java?

- ❑ Solve a number of problems in modern programming practice.
- ❑ Develop advanced software for **consumer electronics**:
 - ❑ embedded processors need small, reliable, portable, distributed, real-time codes.
- ❑ Intended to use C++, but encountered a number of problems. Initially these were just **compiler technology problems**, but as time passed more problems emerged that were best solved by changing the language.

Characteristics of Java

- Java is simple
- Java is object-oriented
- Java is robust
- Java is secure
- Java is architecture-neutral
- Java is portable
- Java's high quality performance
- Java is multithreaded
- Java is dynamic

Software required:

- **Java Compiler:**

- JDK (Java Development Kit):
 - J2SE 5.0 (JDK 1.5.0)
- Download from:
 - <http://java.sun.com/j2se/1.5.0/download.jsp>

- **Java Editor**

- JCreator 3.00 or JCreator 3.50 (simple)
- NetBeans
- JBuilder
- J#
- IntelliJ
- Eclipse
- TextPad
- BlueJ