OOP With Java Module
100 Marks
40 Lab Exam
40 CCEE
10 - Assignments
10 - Quiz/ Case Study

OOP Concepts

Major Pillars
1. Abstraction
2. Encapsulation
3. Modularity
4. Hirerachy

Minor Pillars
1. Typing/ Polymorphism
2. Concurrency
3. Persistance

C-> POP
C++ -> OOP

Language
1. Own Rules
2. Own Syntax

1. Abstraction
funtion call, objects

2. Encapsulation
defining a function
defining a class

3. Modularity
namespaces
classes
files

Hirerachy
has-a (Association)
1.Composition
2.Aggegration

is-a (Inheritance)

1. Polymorphism
1 entity -> multiple forms
function
class

// function overloading
add(int,int)
add(int,int,int)
add(double,double)

// function overriding
1. Base and derived with inheritance
2. Base class function should be virtual
3. define the base class fun once again
in derived class with same signature

2. Concurrency

Executing the code
concurrently

3. Persistance

to persist the data.
to save the data permanantly

```
class Person{

}
```

OOSD -> Object Oriented Software Development
1. OOA -> get the requirements,
2. OOD ->Design the objects
3. OOP ->Decide the OOP language to choose

eAttendance System
Student
Employee
Attenadence

```
class Attendance{
Time inTime;
Time outTime;
Date date;
}
```

```
class Student{
int id
string name
double marks
}
```

```
class Employee{
int id
string name
double salary
}
```

Java
1991-> James Gosling

smaller devices

*7

Java Platforms
1. Java Card ->
2. Java ME-> Java Micro Edition
3. Java SE -> Desktop Applications
4. Java EE -> Enterprise Edition
web applicaption development

Java Installation

JDK-> Java Development Kit

SDK -> Software Development Kit

compiler to compile it

1.Tools
2.Libraries
3.Docs
4.Runtime environment

Compiler

javac
java
javap

JDK- Java Development Kit
Tools + docs + JRE(Java RunTime Environment)
javac
java
javap
.....

JDK = tools + docs + JRE
JDK = tools + docs + (JVM + rt.jar)

JDK

Java Development Kit

tools
+
docs
+
jre

JRE

Java RunTime Environment
rt.jar + JVM

predefined libraries
+
Java Virtual Machine

JVM
- It is a java virtual machine which
is responsible to execute the java code
- It manages the entire memory
for your java applications

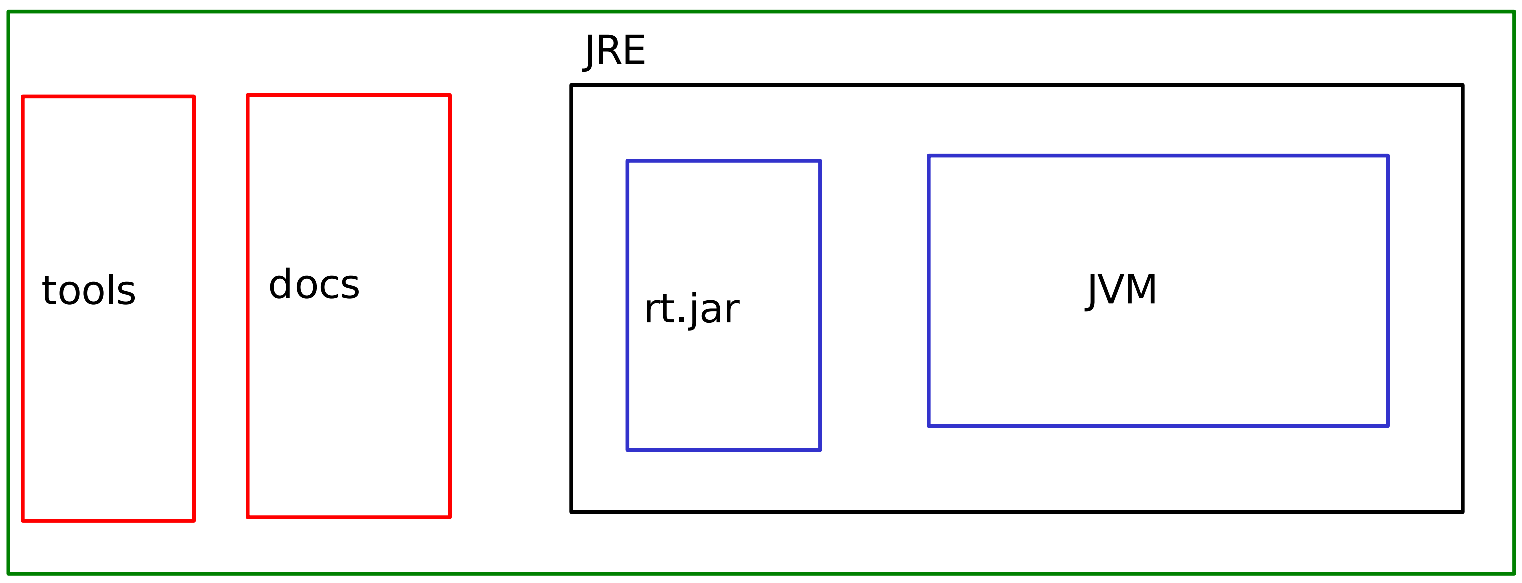
Developer

Client

JRE
java tool

JDK -> Platform Dependent

open jdk-11

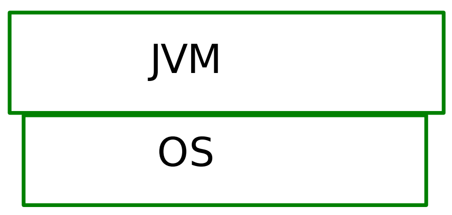


STS 4.X -> IDE

Spring Framework

STS

WORA-> Write Once Run Anywhere



Must to execute the java code

```
class System{
//data member
public static PrintStream out;

}
```

System.out;

Workspace -> container -> Multiple projects

Day01 -> Workspace

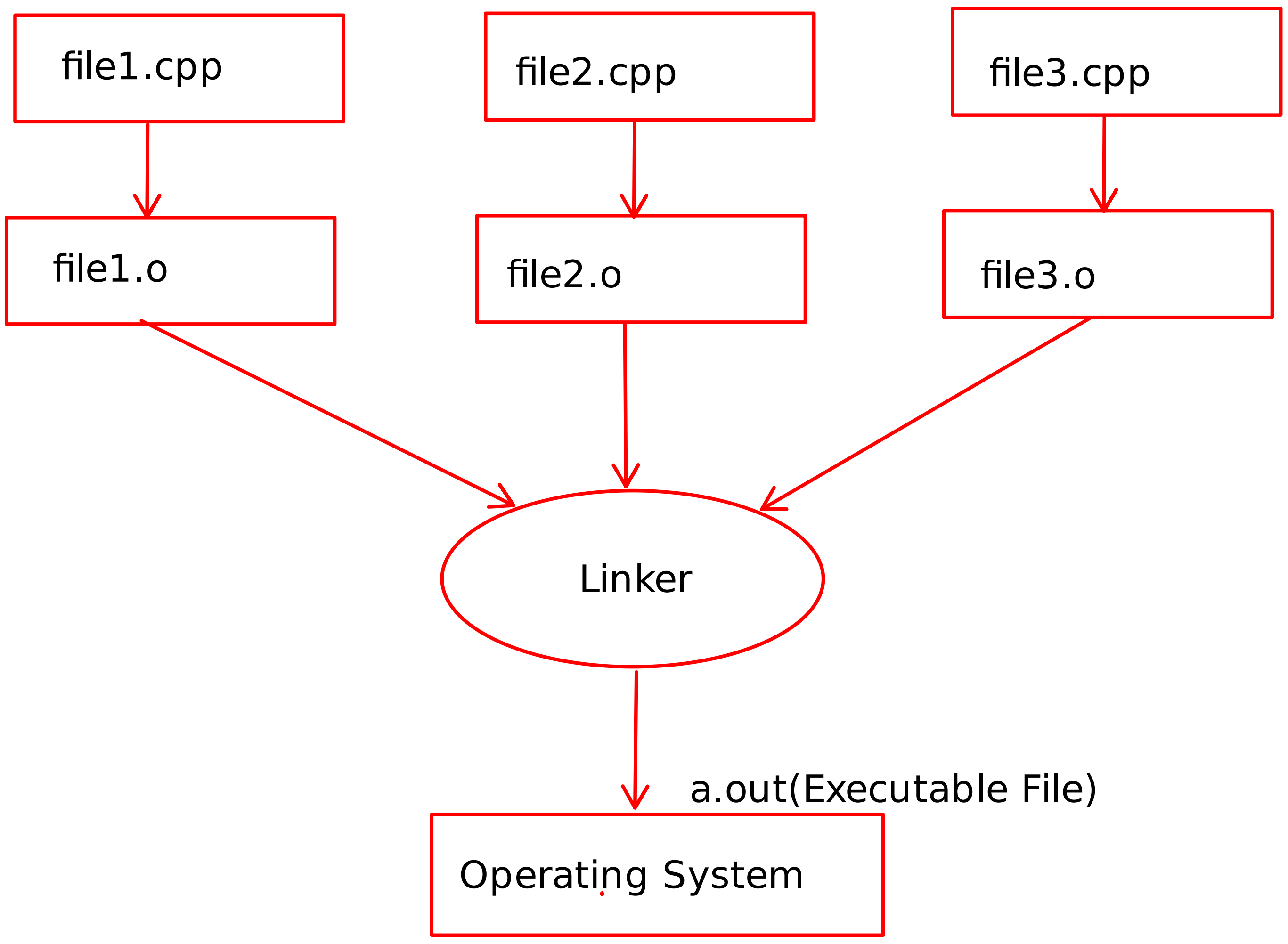
Day02-> Workspace

Day03-> Workspace

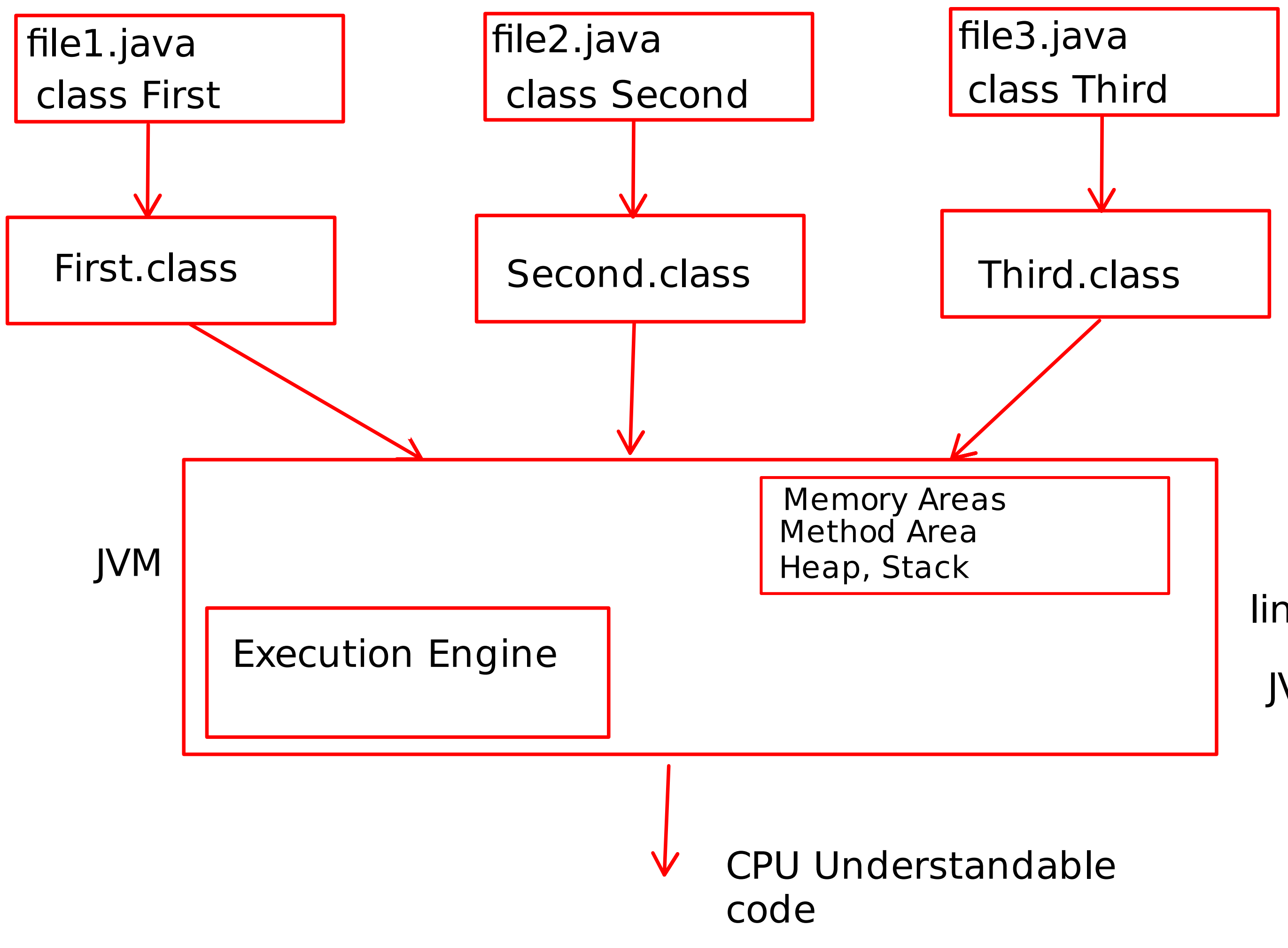
Assignments

Assign01-> Workspace

Assign02-> workspace



g++ file1.cpp file2.cpp file3.cpp

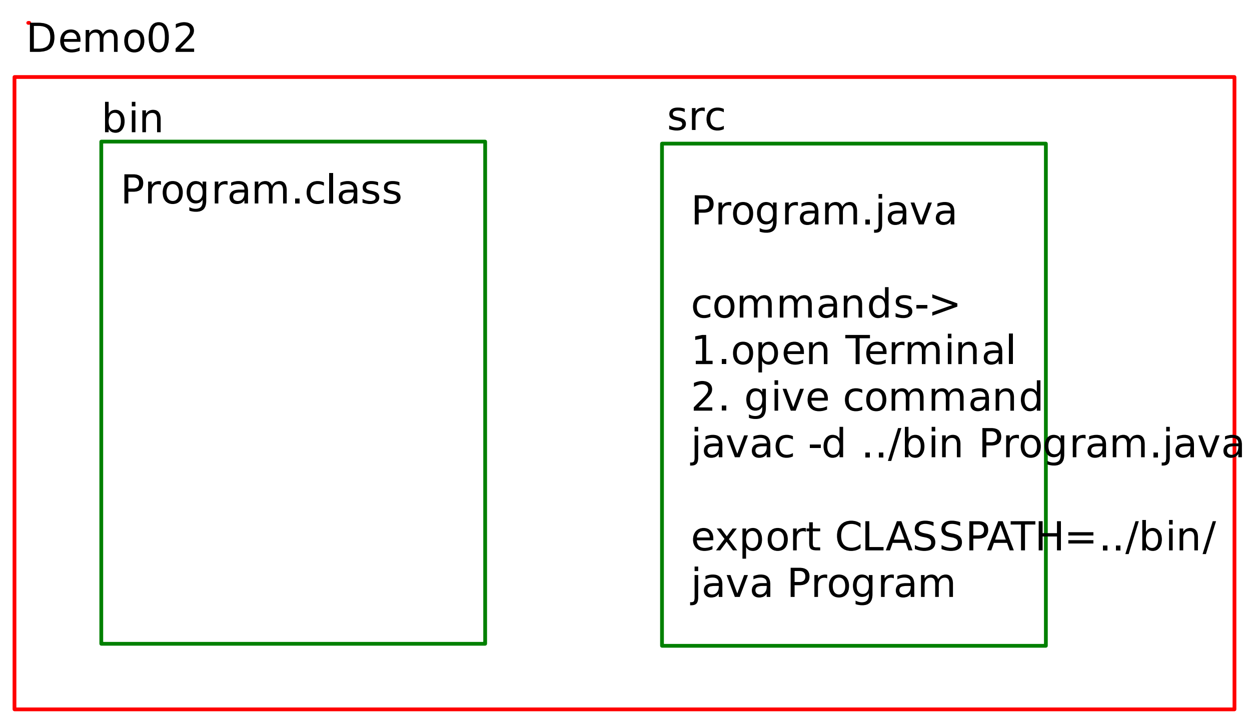


javac file1.java file2.java file3.java

class files are platform independent

linux, windows, mac

JVM is platform dependent



commands->
1.open Terminal
2. give command

```
javac -d ../bin Program.java

export CLASSPATH=../bin/
java Program
```

java Program
In Current Directory

CLASSPATH = It is a java environment Variable. It stores the path to the .class files

In Linux
- to display the classPath

```
echo $CLASSPATH
```

- to set the classpath

```
export CLASSPATH=<path of .class files>  -> export CLASSPATH=../bin/
```

```
java Program02
```

```
Program02.main();
```

For STS ->
the name of class in which main exists and the name of .java file must be same

Program02..java

As per java language specification
the name of public class and .java file
must be same

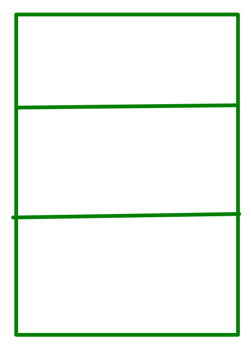
Program02.class
Test.class

```
java Program02
```

Class , Object
{
// data members
fields

// member functions
methods
}

heap



new Employee

Part - 1

OOP -> Revise

JDK installation

STS-> Downlaod/ Extract

Java Documentation -> java 8

HelloWorld -> using vscode
javac
java

Helloword -> in src and bin using vscode
javac -d ../bin/
export CLASSPATH=../bin/
java

Part - 2 (USE STS compulsary)

Demo01-> Hello world

Demo02 -> Multiple class in same java file, with multiple main

Demo03 -> Multiple .java files with multiple main

Demo04 -> keep name of public class and file different and check for the error

Tomorrow -
Scanner
Console
Language fundamentals
Datatypes