Introduction

Some Basics

Algorithm

Set of steps/instructions to perform specific well defined task

Program

A set of instructions syntax in a sequence that computer can interpret and execute .
Instructions should be in proper syntax

Java is not a natural Language

Processing natural language is a challenging task.

Procedural Languages

- Code should be written into distinct procedures or functions
- Local and global data should be declared
- Local data should be managed and manipulated by functions and procedures in side which it is declared
- Many functions can assess Global data at the same time ,data access is uncontrolled and unpredictable or result may be misinterpreted
- Code reuse is difficult to implement
- Testing and debugging is also not easy to implement
- Dividing tasks into different subtasks is not easy and its integration is also difficult

Object oriented Languages

- Every thing is treated as objects
- Every object consists attributes/member variables and its behavior
- Data should be managed in an easy way
- Data access is controlled and managed by using its accessibility
- Code reuse is easy to implement
- Testing and debugging is a easy to implement
- Code / Subtask declaration ,implementation , integration

Major concepts related to OOP, concepts:
Three Pillars

Encapsulation
Inheritance
Polymorphism

In order to relate object-oriented programming to the real world

Any entity may be represented as an object
For example – car ,bus, place ,person , any event

Software objects-

have the ability to store data, along with the ability to modify or manipulate that data.

A description of an object-oriented program is explaned along with a description of an object, and how it relates to encapsulation.

software objects:=>

⇒have the ability to accept messages and to perform an action

=>modify their state with reference to its behavior or activity to be performed

=>return a value, or some combination of the above.

=> OOP, includes persistence, state, messages, methods, and behaviors.

Encapsulation

Encapsulation is the concept that an object should totally separate its application from its implementation.

All the data and implementation code for an object should be entirely hidden behind its interface.

The idea is that we can create an interface (Public methods in a class) and, as long as that interface remains consistent, the application can interact with our objects.

This remains true even if we entirely rewrite the code within a given method thus the interface is independent of the implementation.

An Object-Oriented Program consists of a group of cooperating objects, exchanging messages, for the purpose of achieving a common objective.

Abstract concepts, such as the concept of an object or encapsulation, can often be best understood by comparing them to real-world analogies.

Example- consider Bus as an abstraction it includes features as well as activities performed by that in a class.

The instance of class is the actual representation

Object:-Have

The ability to store data

It mean that object respond correctly to the instruction based on data.

Accessing the stored data

Modifying or manipulating the stored data

The human interface also makes it possible for storing or modifying those values.

Object change of state

What I have done here is to send a message as object returning a value back to me indicating that the mission has been accomplished.

An object has changed its state when one or more data values stored in the object have been modified.

perform an action

when an object responds to a message, it will usually perform an action, change its state, return a value, or some combination of the above.

Structure of Java Program

```
class class-name {
          member variable declaration;
          Constructor Declaration
          public static void main(String args[ ]) {
                    statement1;
                    statement2;
                         …
                         …
          }
}
```

Example

“F.java”

```
class First {
public static void main(String a[]) {
        p();
        System.out.println(“This My first program”);
        System.out.println(“Hello World”);}
static void p()
{ int i=20,j;
J=30;
System.out.println(“sum=”+(i+j)); }
```

Compiling & Running the Program

Compiling: is the process of translating source code written in a particular programming language into computer-readable machine code or an intermediate code that can be executed.class file is created for each

```
$  javac F.java
```

This command will produce a file ‘First.class’, which is an intermediate code(Byte Code) .To run the program use command ‘java’.

Running: is the process of executing program on a computer.

```
$  java First
```

About Printing on the Screen

1. System.out.println(“Hello World”); – outputs the string “Hello World” followed by a new line on the screen.
2. System.out.print(“Hello World”); - outputs the string “Hello World” on the screen. This string is *not* followed by a new line.
3. Some Escape Sequence –
   - \n – stands for new line character
   - \t – stands for tab character

Tips About Programming

- Some common errors in the initial phase of learning programming:
  - Mismatch of parentheses
  - Missing ‘;’ at the end of statement
  - Identifier declaration
  - Case sensitivity

- The best way to learn programming is writing a lot of programs and practice

Assignments

1. Write a program which prints the following information about a customer :

   cust-name mail-id cust-id

   Each entry should be on a separate line.

2 Create a class student and display a single record of the same

3 Write a program to print report card of a student

Stud-name , branch, percentage