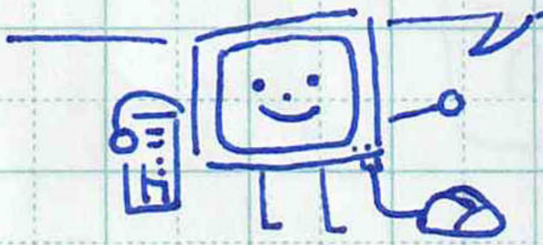
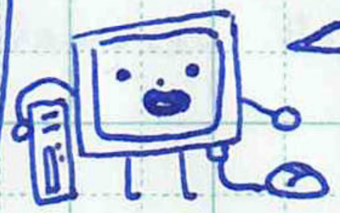
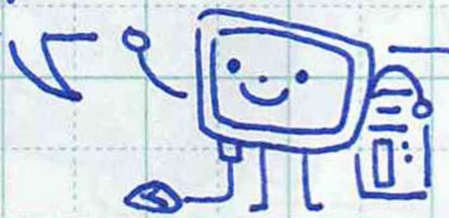
PRINCIPLES of OBJECT ORIENTED PROGRAMMING





JAVA IS A CLASS-BASED OBJECT-ORIENTED PROGRAMMING LANGUAGE.

OBJECT ORIENTED PROGRAMMING (OOP) IS A PROGRAMMING MODEL THAT IS USED TO ORGANIZE CODE / SOFTWARE AROUND CLASSES ~~DATA~~ AND OBJECTS, WHICH CONTAIN DATA AND METHODS.



CLASS: FRUIT

OBJECTS:

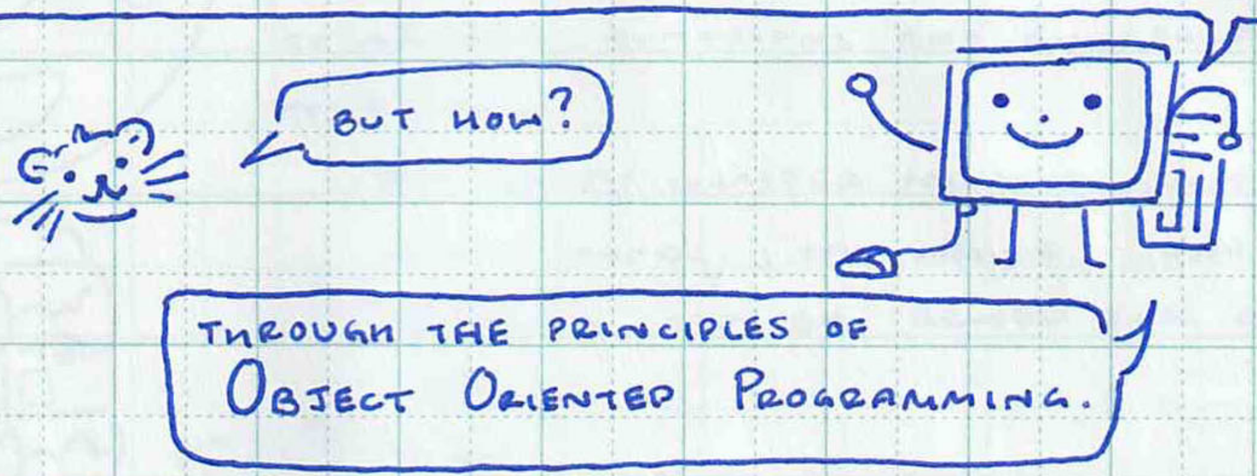
APPLES ORANGES MANGOS BANANAS

EXAMPLE!:
A CLASS (FRUIT), IS A TEMPLATE FOR OBJECTS

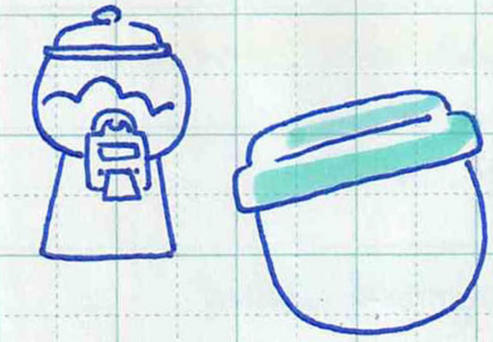
OBJECTS ARE INSTANCES of THESE CLASSES.

THERE ARE MANY ADVANTAGES TO USING OOP.

- BREAKS DOWN COMPLEX PROJECTS TO SIMPLER AND MANAGEABLE BITS
- SIMPLIFIES PROGRAMMING AND PROMOTES READABILITY & REDUCES REDUNDANCY
- PROMOTES CODE FLEXIBILITY & REUSABILITY



THERE ARE 4 MAJOR PRINCIPLES TO OBJECT ORIENTED PROGRAMMING.

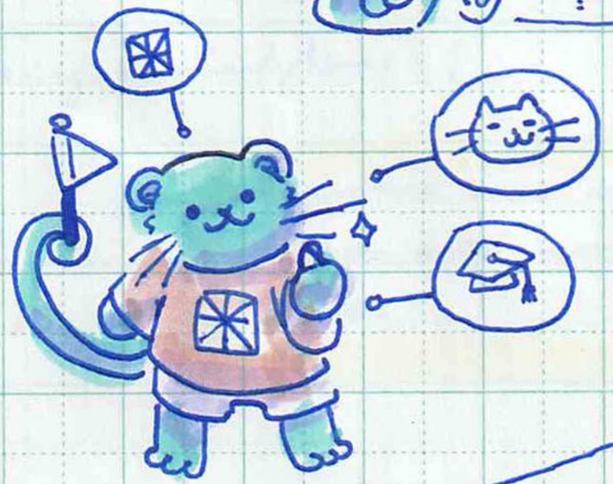


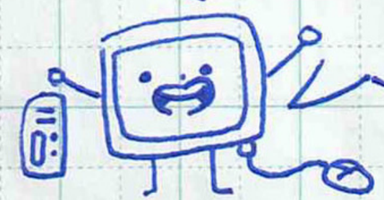
1. ENCAPSULATION

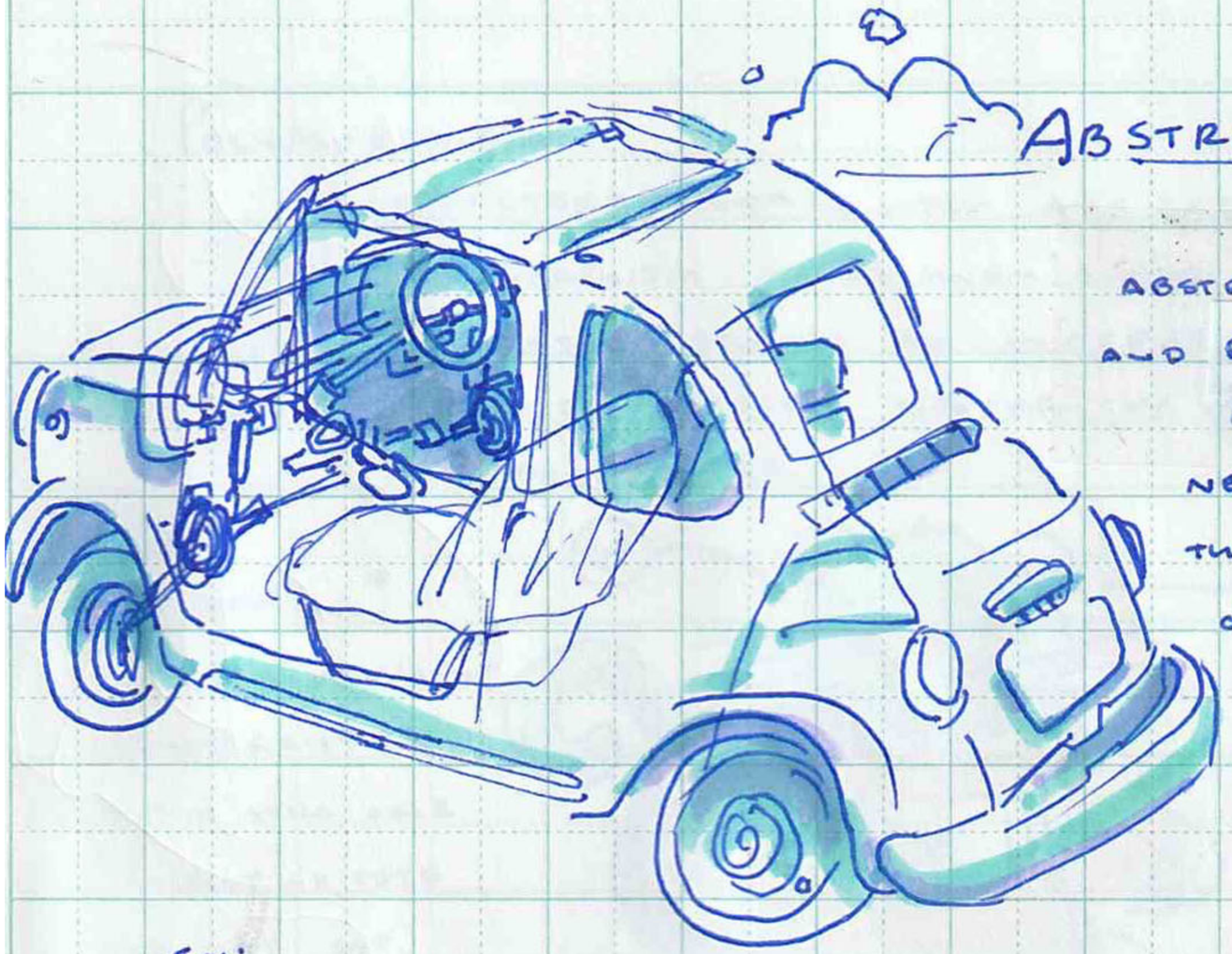
2. ABSTRACTION

3. INHERITANCE

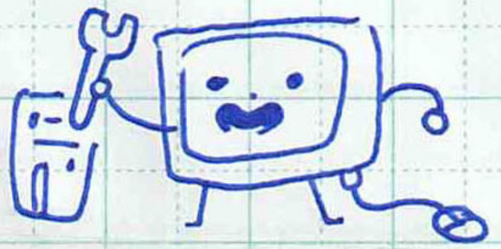
4 POLYMORPHISM







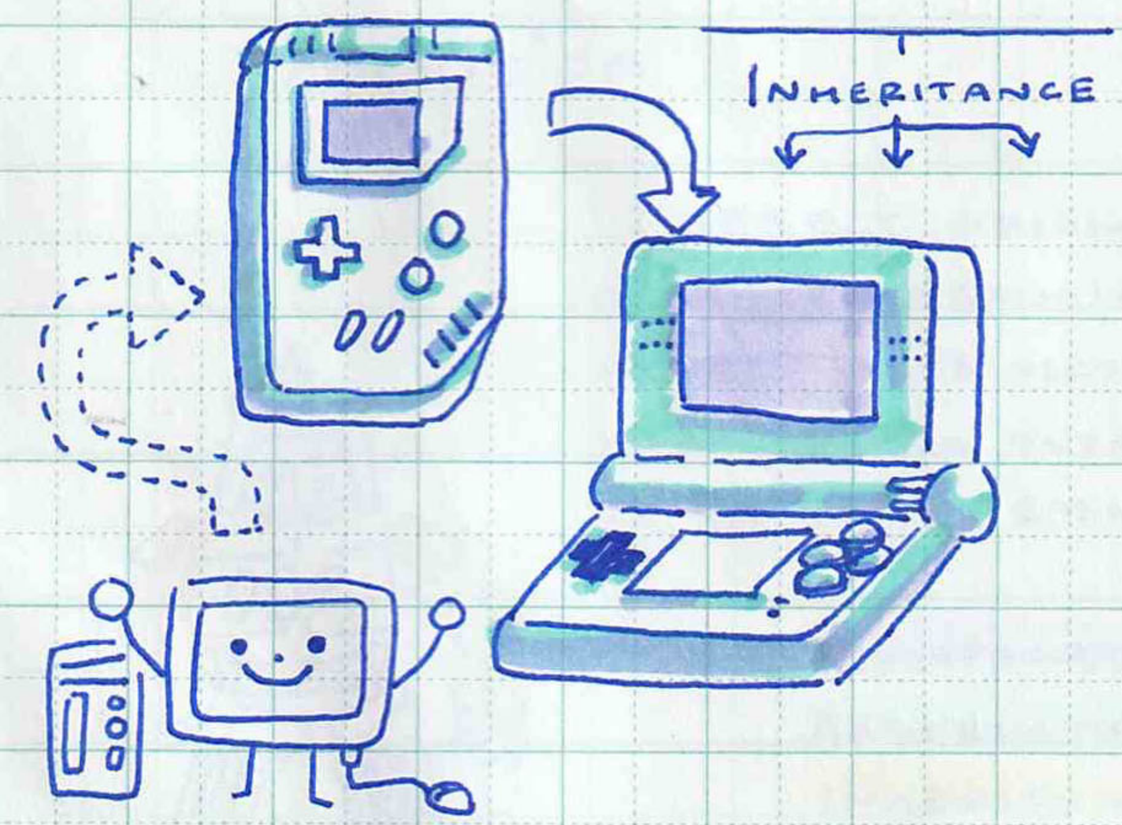
ABSTRACTION



ABSTRACTION REDUCES COMPLEXITY AND REDUCES IMPACT OF CHANGE. ABSTRACTION EXPOSES ALL THE NECESSARY DETAILS AND HIDES THE REST; REDUCING THE AMOUNT OF CHARACTERISTICS IMPACTED BY A USER.

Ex:

FOR THIS LAB, ~~OR~~ ONLY A MECHANIC (PROGRAMMER) WOULD KNOW TO INTERACT AND CHANGE THE INTERIOR MECHANICS OF THE VEHICLE WHEREAS THE DRIVER WOULD ONLY KNOW TO INTERACT WITH THE NORMAL DRIVER THINGS LIKE PEDALS; STEERING, ETC.



INHERITANCE REMOVES REDUNDANCY IN CODE.

IT DOES SO BY ACQUIRING THE PROPERTIES FROM ONE CLASS TO ANOTHER.

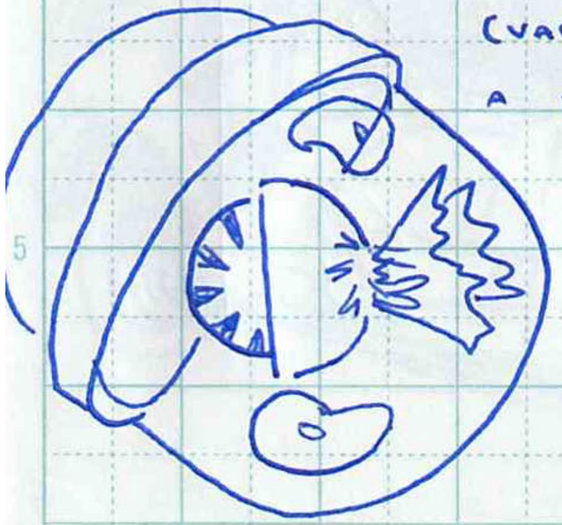
CLASSES INHERITING PROPERTIES ARE SUB-CLASSES. CLASSES WITH INHERITED PROPERTIES ARE PARENT CLASS / SUPERCLASS.

EX. THE NINTENDO D.S. IS THE CHILD CLASS INHERITING FROM THE GAMEBOY COLOR PARENT CLASS.

ENCAPSULATION:

ENCAPSULATION REDUCES CODE COMPLEXITY AND PROMOTES CODE REUSABILITY!

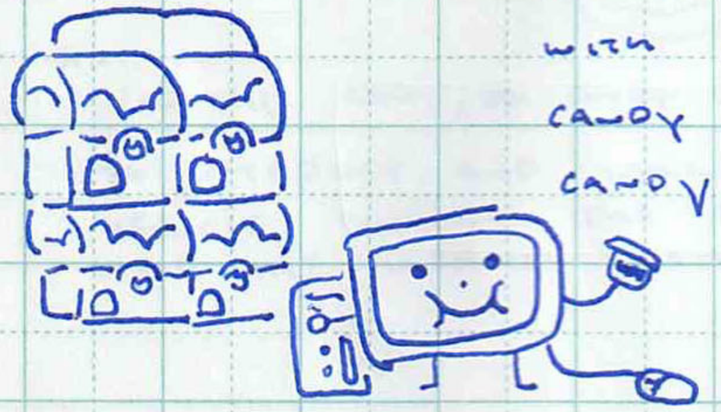
IN JAVA, ENCAPSULATION IS A MECHANISM IN WHICH DATA AND CODE ACTING ON DATA (VARIABLES + METHODS) ARE 'WRAPPED' TOGETHER AS A SINGLE UNIT.



IT IS ALSO KNOWN AS INFORMATION HIDING.

THIS MECHANISM REDUCES COMPLEXITY AND PROMOTES REUSABILITY BY LIMITING DATA ACCESS TO MEMBER FUNCTIONS AND BY GROUPING ELEMENTS TOGETHER.

EX: CANDY WRAPPER PREVENTS DIRECT CONTACT WITH CANDY; TOY CAPSULE IS USED TO GET CANDY & CAN BE REUSED FOR OTHER CANDY



POLYMORPHISM

REFACTORS ~~AND~~ SWITCH AND CASE STATEMENTS.

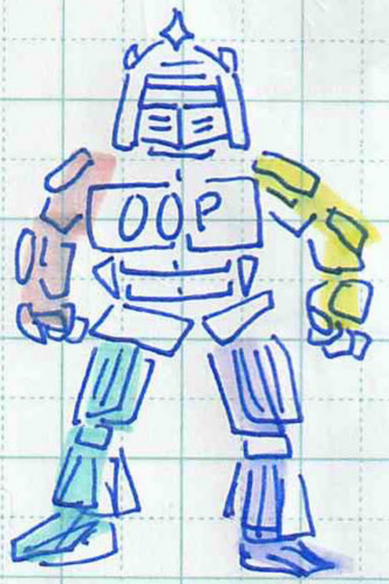
POLYMORPHISM OCCURS WHEN THERE IS AN ABUNDANCE OF CLASSES RELATED BY INHERITANCE; IT IS THE ABILITY TO PROCESS OBJECTS DIFFERENTLY ON THE BASIS OF CLASS AND DATA TYPES.

EX: Kind Pete ♥

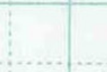
HAS MANY DIFFERENT CHARACTERISTICS

BUT IS STILL ABLE TO EXIST AS PETE AND NOT CAT, STUDENT, CHAPMAN, ETC.

Conclusion



OBJECT ORIENTED PROGRAMMING (OOP) IS A PROGRAMMING LANGUAGE TOOL / MODEL. IT IS USED TO ORGANIZE CODE / SOFTWARE BY ITS DATA AND FUNCTIONS.
IT HAS FOUR BASIC CONCEPTS.

ENCAPSULATION : COMPLEXITY ↓ + 
ABSTRACTION : COMPLEXITY ↓ + IMPACT OF Δ
INHERITANCE : REDUNDANCY ↓
POLYMORPHISM : REFACTORING

OVERALL O.O.P IMPROVES PRODUCTIVITY QUALITY AND COMPREHENSIBILITY.

YAY O.O.P!!