POLYMORPHISM
⑤

MESSAGE PASSING
⑥

INHERITANCE
④

DATA
ABSTRACTION ← OBJECT ORIENTED
⑦   PROGRAMMING → ENCAPSULATION
                                              ③

DYNAMIC BINDING
⑧

① CLASS   ② OBJECT

CLASS   user defined data type
   data member & member functions
          blueprint of an object

HUMAN   CLASS

age   weight
       gender

common
    properties
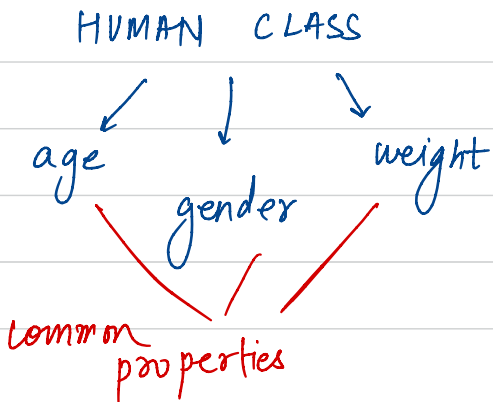
OBJECT   instance of a class
          when instantiated → memory allocated
          represents real life entities

          BHAGA OBJECT
              ↙ ↓ ↘ STAND
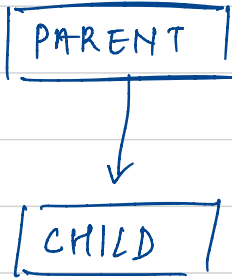   SPEAK   WRITE
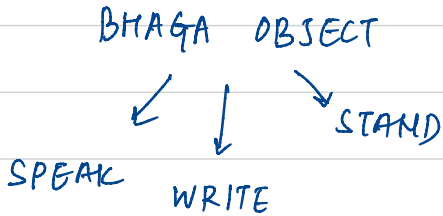
3.   DATA   only providing essential information
ABSTRACTION   hiding background details & implementation

4. ENCAPSULATION   variables or data of a class hidden
                    from any other class can only be accessed
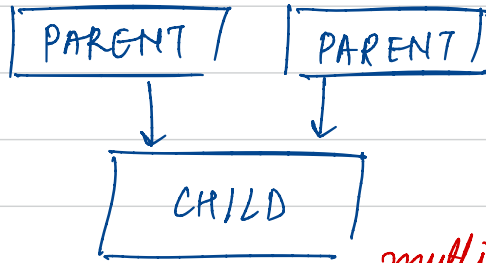   through any member function of their class.
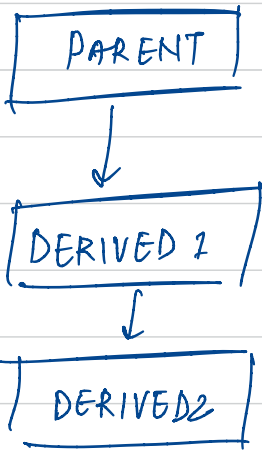
          — data hiding from other classes

Variables
DATA
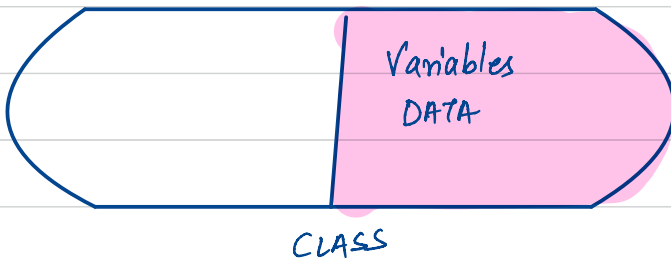
CLASS

(5) INHERITANCE — derive properties & characterstics from another class

```
┌──────────┐        ┌──────────┐   ┌──────────┐
│ PARENT   │        │ PARENT   │   │ PARENT   │
└──────────┘        └──────────┘   └──────────┘
     │                   │              │
     ▼                   ▼              ▼
┌──────────┐          ┌──────────────┐
│ CHILD    │          │   CHILD      │
└──────────┘          └──────────────┘
```

Single Inheritance

multiple inheritance

```
┌──────────────┐                ┌──────────────────────────┐
│ PARENT       │                │        PARENT            │
└──────────────┘                └──────────────────────────┘
     │                            │         │          │
     ▼                            ▼         ▼          ▼
┌──────────────┐           ┌────────┐  ┌────────┐  ┌────────┐
│ DERIVED 1    │           │ CHILD1 │  │ CHILD2 │  │ CHILD3 │
└──────────────┘           └────────┘  └────────┘  └────────┘
     │
     ▼
┌──────────────┐
│ DERIVED2     │
└──────────────┘
```

Multi level inheritance
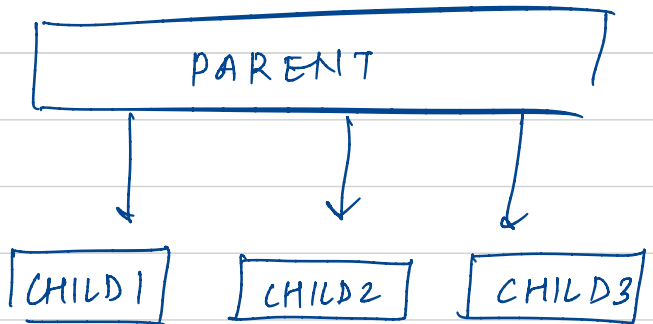
Hierarchical Inheritance

```
              ┌──────────────┐
              │ PARENT       │
              └──────────────┘
               ╱            ╲
              ▼              ▼
   ┌──────────────┐      ┌──────────────┐
   │ DERIIVED     │      │ DERIVED      │
   └──────────────┘      └──────────────┘
              ╲              ╱
               ▼            ▼
              ┌──────────────┐
              │ DERIVED      │
              └──────────────┘
```
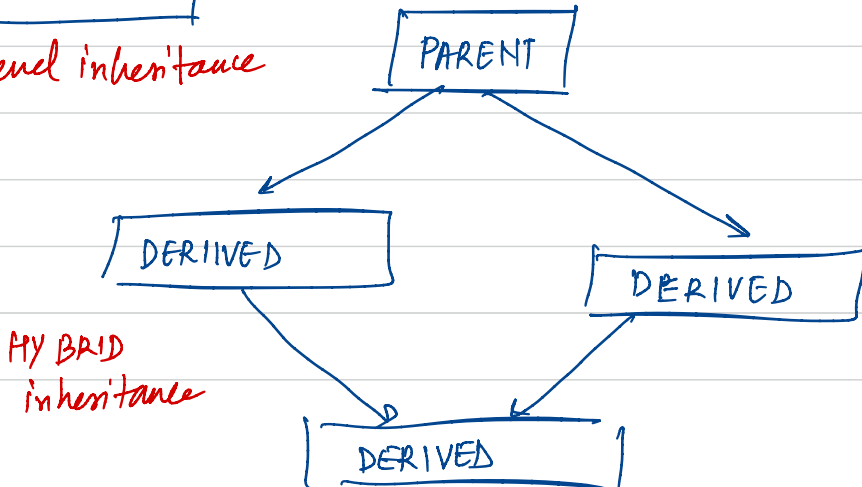
HYBRID inheritance

(6) POLYMORPHISM   Ability to have more than one form

Make _ sound

CAT   DOG   DUCK

Meow   BARK   QUACK
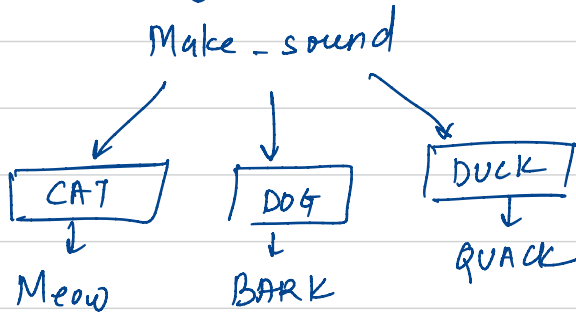
(7) DYNAMIC BINDING

— code to be executed in response to function call is decided runtime

(8) MESSAGE   — Objects communication with each other
     PASSING   by sending & recieving message

name of   name   information
object   of   to be sent
                function