Desain dan Pemrograman Berorientasi Objek

RELASI ANTAR KELAS DAN Pewarisan (*inheritance*)
STUDI KASUS - Contoh

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```python
class Manusia:
#kelas yang digunakan untuk mengimplementasikan kelas manusia

    def __init__(self):
    #konstruktor
        self.nama = ""
        self.alamat = ""
        self.no_ktp = ""
        self.no_alamat = ""

    def setNama(self, nama):
    #mengeset nilai atribut nama
        self.nama = nama

    def getNama(self):
    #mengembalikan nilai atribut nama
        return self.nama

    def setAlamat(self, alamat):
    #mengeset nilai atribut alamat
        self.alamat = alamat

    def getAlamat(self):
    #mengembalikan nilai atribut alamat
        return self.alamat
```

Pewarisan Python (1)

```python
from Manusia import Manusia

class Karyawan(Manusia):
#kelas yang digunakan untuk mengimplementasikan kelas karyawan

    def __init__(self):
    #konstruktor
        self.nomorpegawai = ""
        self.jabatan = ""
        self.departemen = ""

    def setNomorPegawai(self, nomorpegawai):
    #mengeset nilai atribut nomorpegawai
        self.nomorpegawai = nomorpegawai

    def getNomorPegawai(self):
    #mengembalikan nilai atribut nomor pegawai
        return self.nomorpegawai

    def setJabatan(self, jabatan):
    #mengeset nilai atribut jabatan
        self.jabatan = jabatan

    def getJabatan(self):
    #mengembalikan nilai atribut jabatan
        return self.jabatan
```

Pewarisan Python (2)

```
#import
from Manusia import Manusia
from Karyawan import Karyawan

#instansiasi
m = Manusia()
k = Karyawan()

#mengeset isi atribut manusia m
m.setNama("Nina");
m.setAlamat("Bandung");
m.setNoKTP("3210988232");
m.setNoTelepon("081583434");

#mencetak atribut manusia m
print("m : nama : " + str(m.getNama()))
print("m : alamat : " + str(m.getAlamat()))
print("m : no ktp : " + str(m.getNoKTP()))
print("m : no telepon : " + str(m.getNoTelepon()))
```

Pewarisan Python (3)

```
#mengeset isi atribut karyawan k
k.setNama("Dina");
k.setAlamat("Bandung");
k.setNoKTP("3215656632");
k.setNoTelepon("0815856534");
k.setNomorPegawai("034323");
k.setJabatan("Puchasing Staf");
k.setDepartemen("Purchasing");

#mencetak isi atribut karyawan k
print("k : nama : " + str(k.getNama()))
print("k : alamat : " + str(k.getAlamat()))
print("k : no ktp : " + str(k.getNoKTP()))
print("k : no telepon : " + str(k.getNoTelepon()))
print("k : nomor pegawai : " + str(k.getNomorPegawai()))
print("k : jabatan : " + str(k.getJabatan()))
print("k : departemen : " + str(k.getDepartemen()))
```

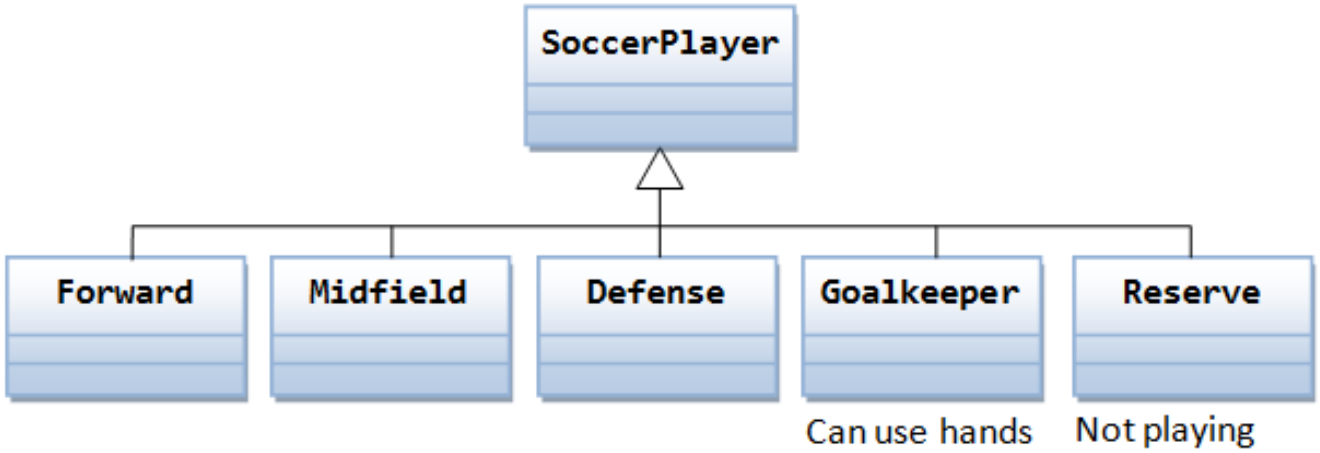
Pewarisan Python (4)

Pewarisan Python (5)

python main.py

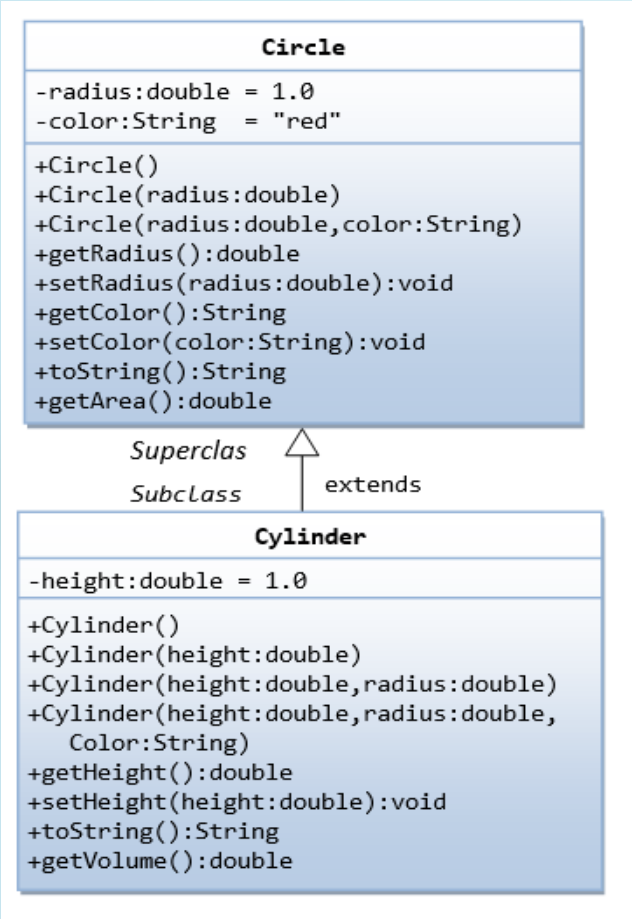
```
m : nama : Nina
m : alamat : Bandung
m : no ktp : 3210988232
m : no telepon : 081583434
k : nama : Dina
k : alamat : Bandung
k : no ktp : 3215656632
k : no telepon : 0815856534
k : nomor pegawai : 034323
k : jabatan : Puchasing Staf
k : departemen : Purchasing
```

CONTOH INHERITANCE (1)



https://www3.ntu.edu.sg/home/ehchua/programming/java/J3b_OOPInheritancePolymorphism.html

CONTOH INHERITANCE (2)



https://www3.ntu.edu.sg/home/ehchua/programming/java/J3b_OOPInheritancePolymorphism.html

CONTOH INHERITANCE (3)

Circle.java (Re-produced)

```
public class Circle {
   // private instance variables
   private double radius;
   private String color;

   // Constructors
   public Circle() {
      this.radius = 1.0;
      this.color = "red";
   }
   public Circle(double radius) {
      this.radius = radius;
      this.color = "red";
   }
   public Circle(double radius, String color) {
      this.radius = radius;
      this.color = color;
   }

   // public getters and setters for the private variables
   public double getRadius() {
      return this.radius;
   }
   public String getColor() {
      return this.color;
   }
   public void setRadius(double radius) {
      this.radius = radius;
   }
   public void setColor(String color) {
      this.color = color;
   }

   /** Returns a self-descriptive String */
   public String toString() {
      return "Circle[radius=" + radius + ",color=" + color + "]";
   }

   /** Returns the area of this Circle */
   public double getArea() {
      return radius * radius * Math.PI;
   }
}
```

https://www3.ntu.edu.sg/home/ehchua/programming/java/J3b_OOPInheritancePolymorphism.html

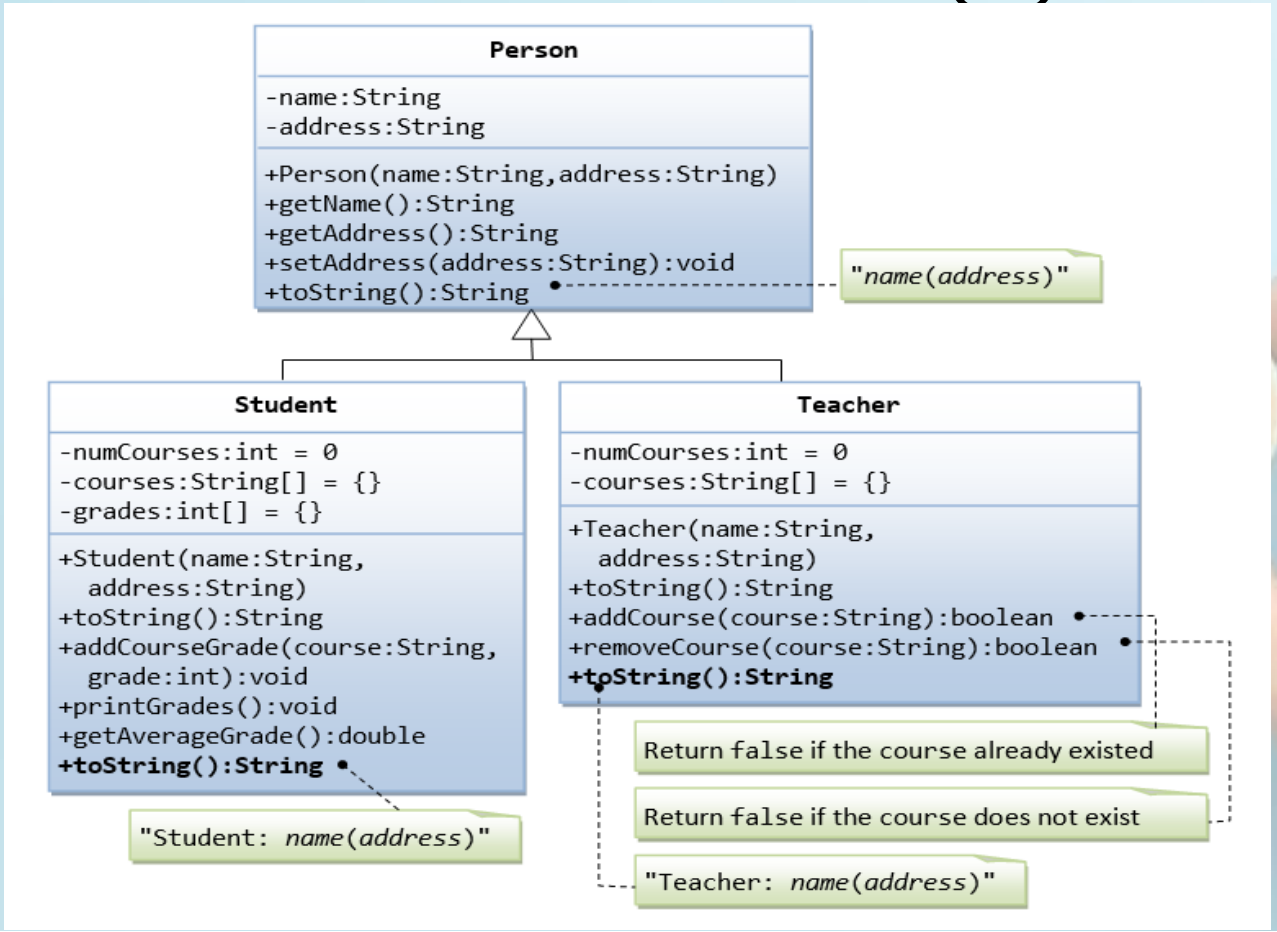
CONTOH INHERITANCE (4)

Cylinder.java

```java
/**
 * A Cylinder is a Circle plus a height.
 */
public class Cylinder extends Circle {
   // private instance variable
   private double height;

   // Constructors
   public Cylinder() {
      super();  // invoke superclass' constructor Circle()
      this.height = 1.0;
   }
   public Cylinder(double height) {
      super();  // invoke superclass' constructor Circle()
      this.height = height;
   }
   public Cylinder(double height, double radius) {
      super(radius);  // invoke superclass' constructor Circle(radius)
      this.height = height;
   }
   public Cylinder(double height, double radius, String color) {
      super(radius, color);  // invoke superclass' constructor Circle(radius, color)
      this.height = height;
   }
   // Getter and Setter
   public double getHeight() {
      return this.height;
   }
   public void setHeight(double height) {
      this.height = height;
   }

   /** Returns the volume of this Cylinder */
   public double getVolume() {
      return getArea()*height;   // Use Circle's getArea()
   }

   /** Returns a self-descriptive String */
   public String toString() {
      return "This is a Cylinder";  // to be refined later
   }
}
```

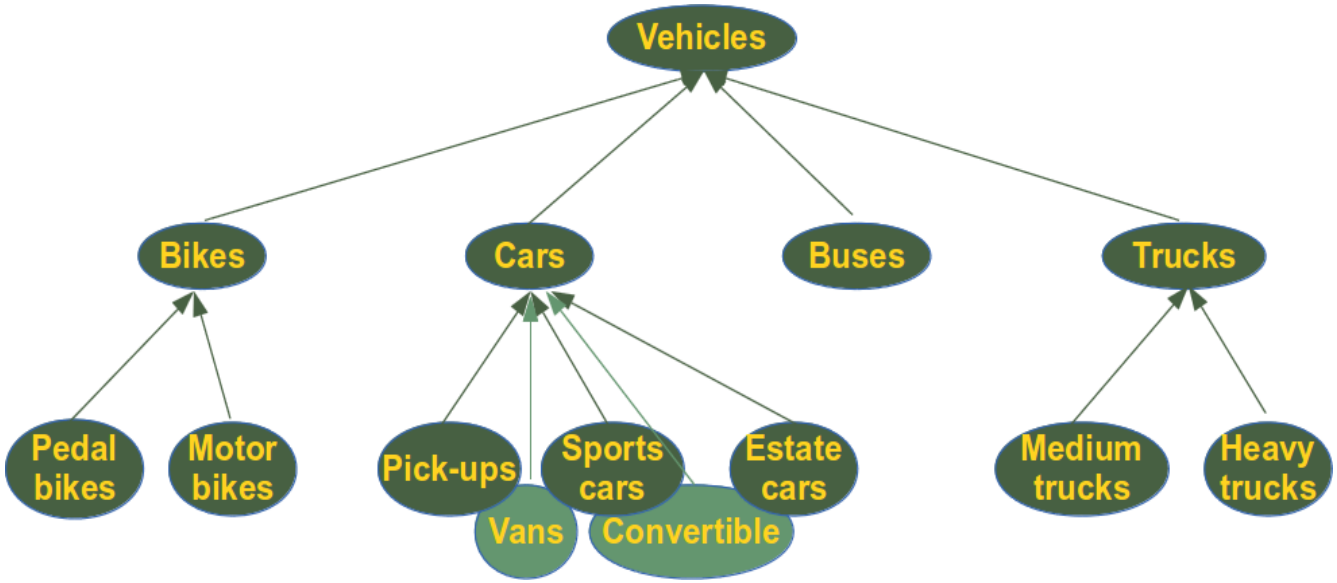
https://www3.ntu.edu.sg/home/ehchua/programming/java/J3b_OOPInheritancePolymorphism.html

CONTOH INHERITANCE (5)



https://www3.ntu.edu.sg/home/ehchua/programming/java/J3b_OOPInheritancePolymorphism.html

CONTOH INHERITANCE (6)



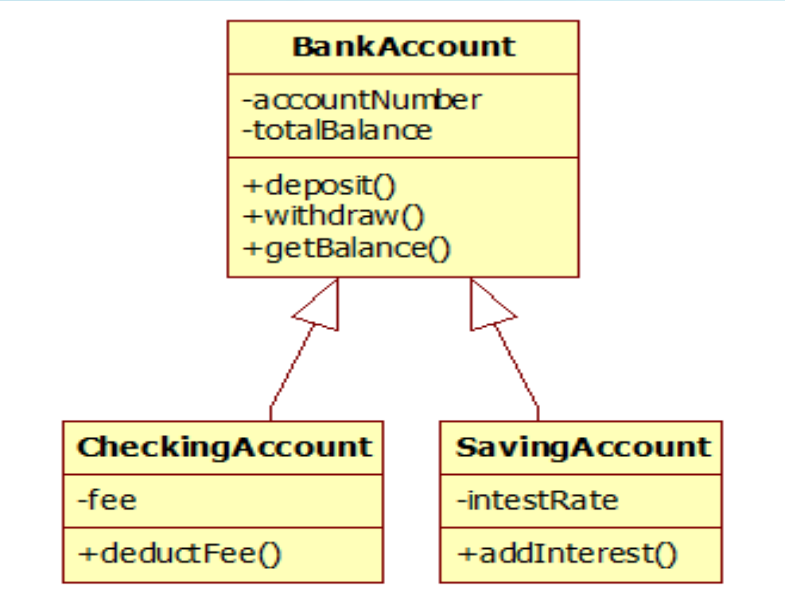
https://www.python-course.eu/python3_inheritance.php

CONTOH INHERITANCE (7)

```
class Robot:

    def __init__(self, name):
        self.name = name

    def say_hi(self):
        print("Hi, I am " + self.name)

class PhysicianRobot(Robot):
    pass

x = Robot("Marvin")
y = PhysicianRobot("James")

print(x, type(x))
print(y, type(y))

y.say_hi()
```

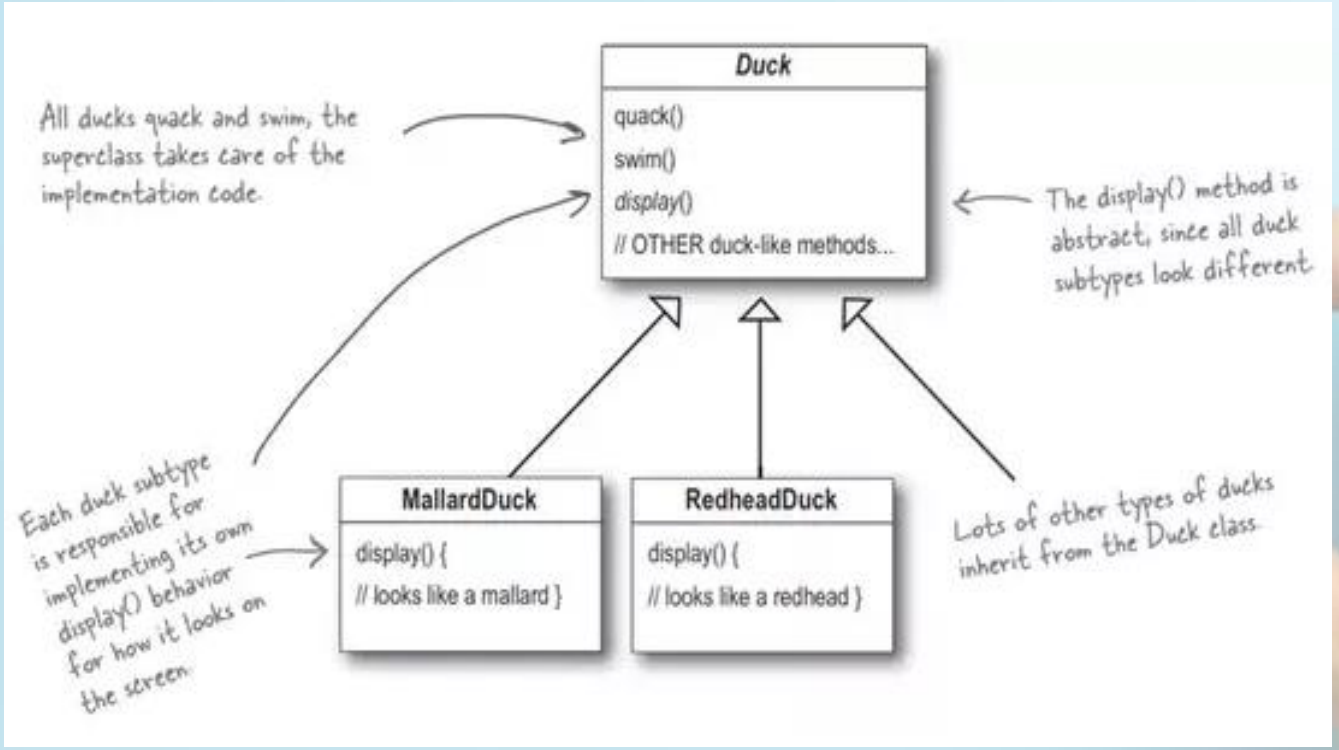
https://www.python-course.eu/python3_inheritance.php

CONTOH INHERITANCE (8)



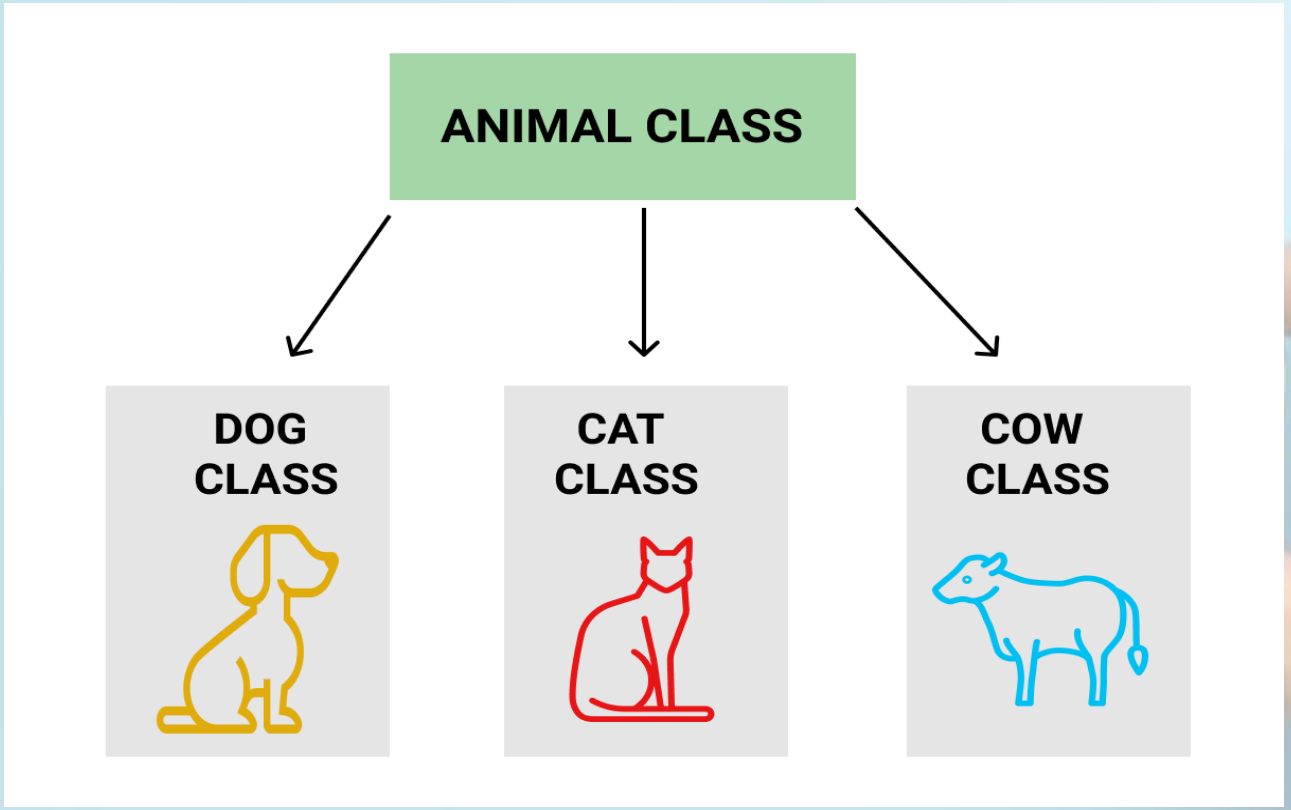
https://www.zentut.com/php-tutorial/php-inheritance/

CONTOH INHERITANCE (8a)



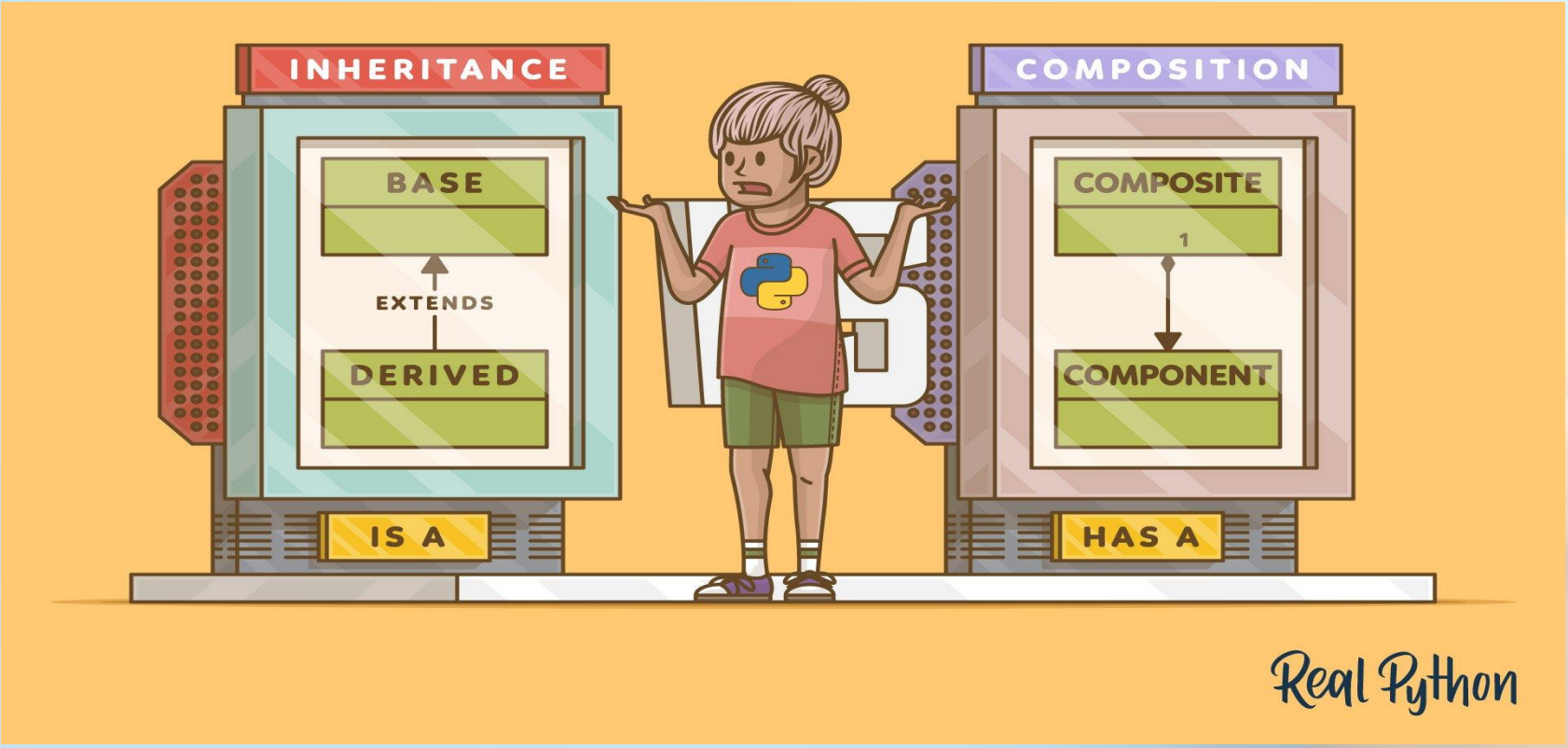
https://www.quora.com/What-are-some-Java-examples-for-the-OOP-principle-of-favoring-object-composition-over-inheritance

CONTOH INHERITANCE (9)



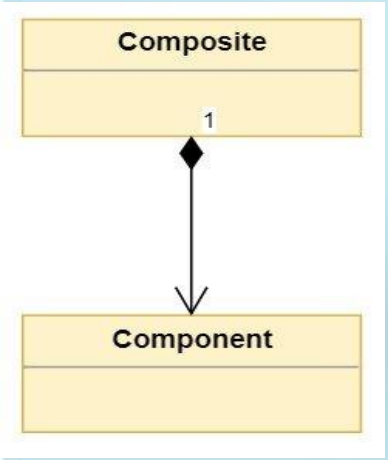
https://www.geeksforgeeks.org/object-oriented-programming-in-cpp/

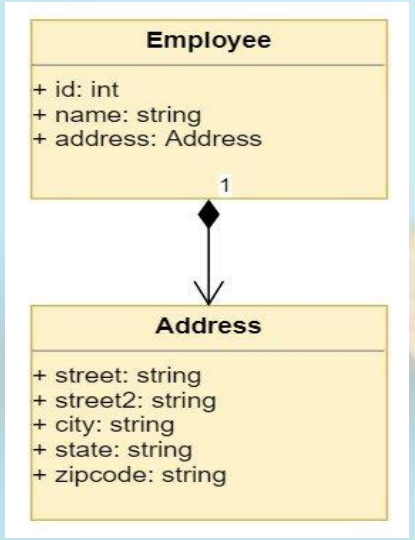
CONTOH INHERITANCE (10)

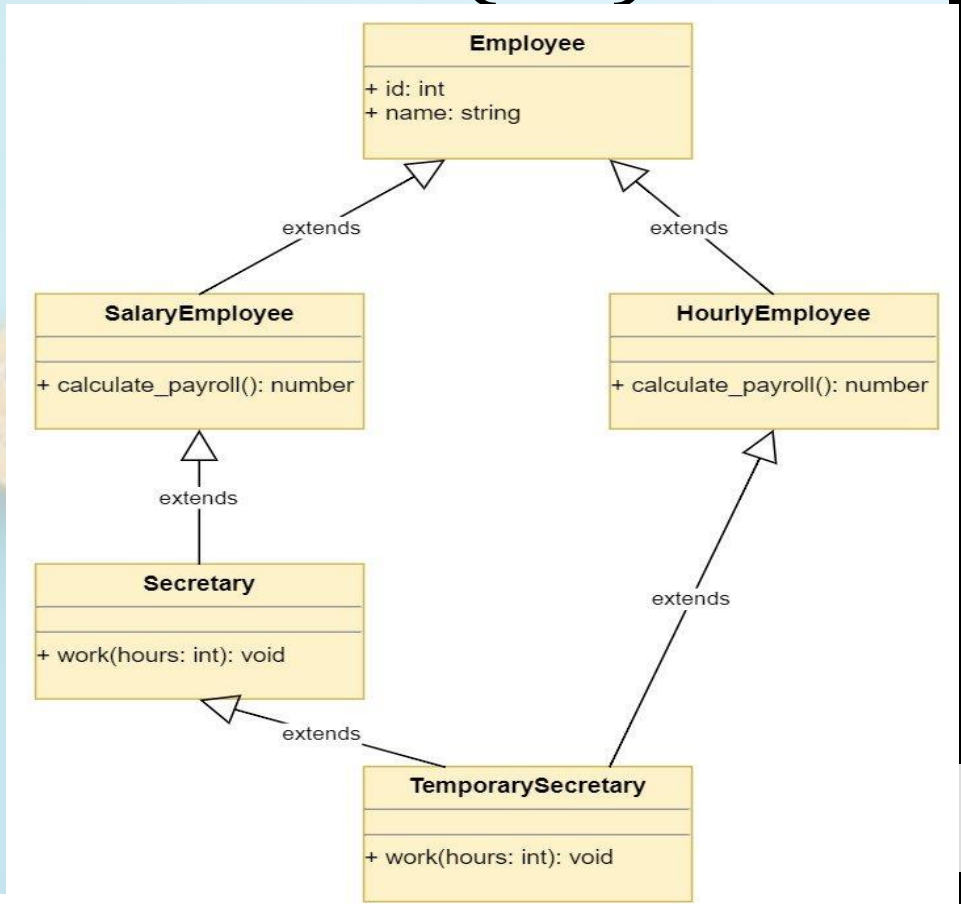


https://realpython.com/inheritance-composition-python/

CONTOH INHERITANCE (11)

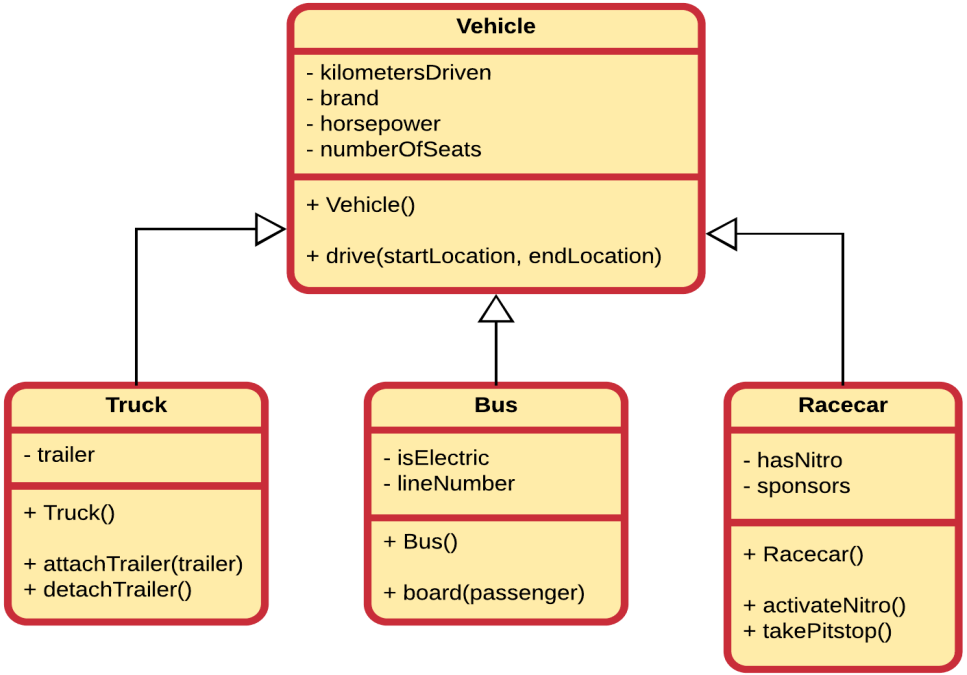






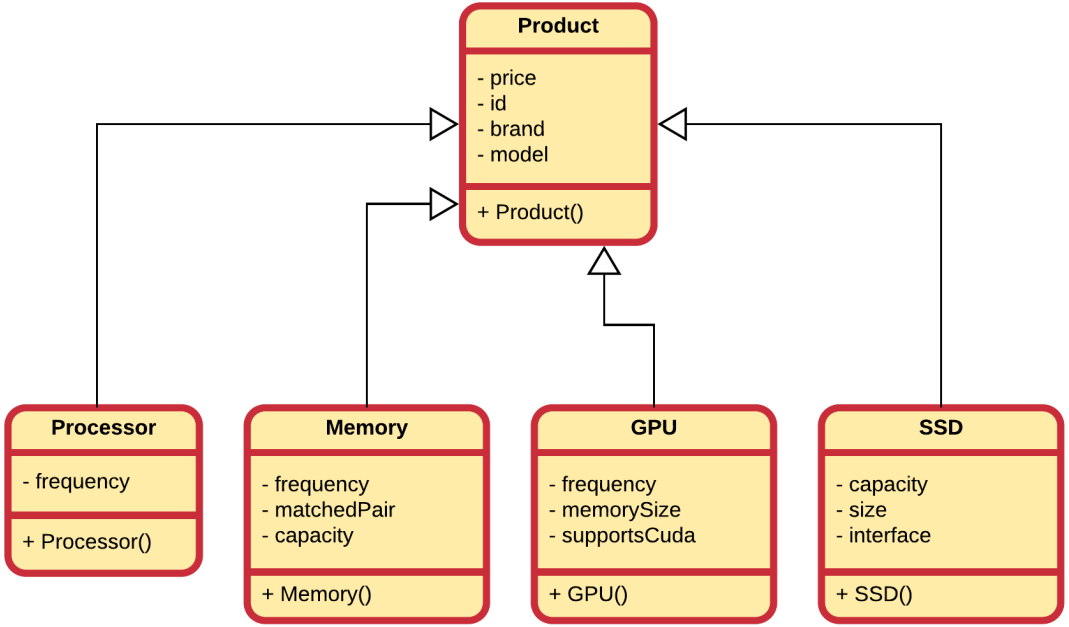
https://realpython.com/inheritance-composition-python/

CONTOH INHERITANCE (12)



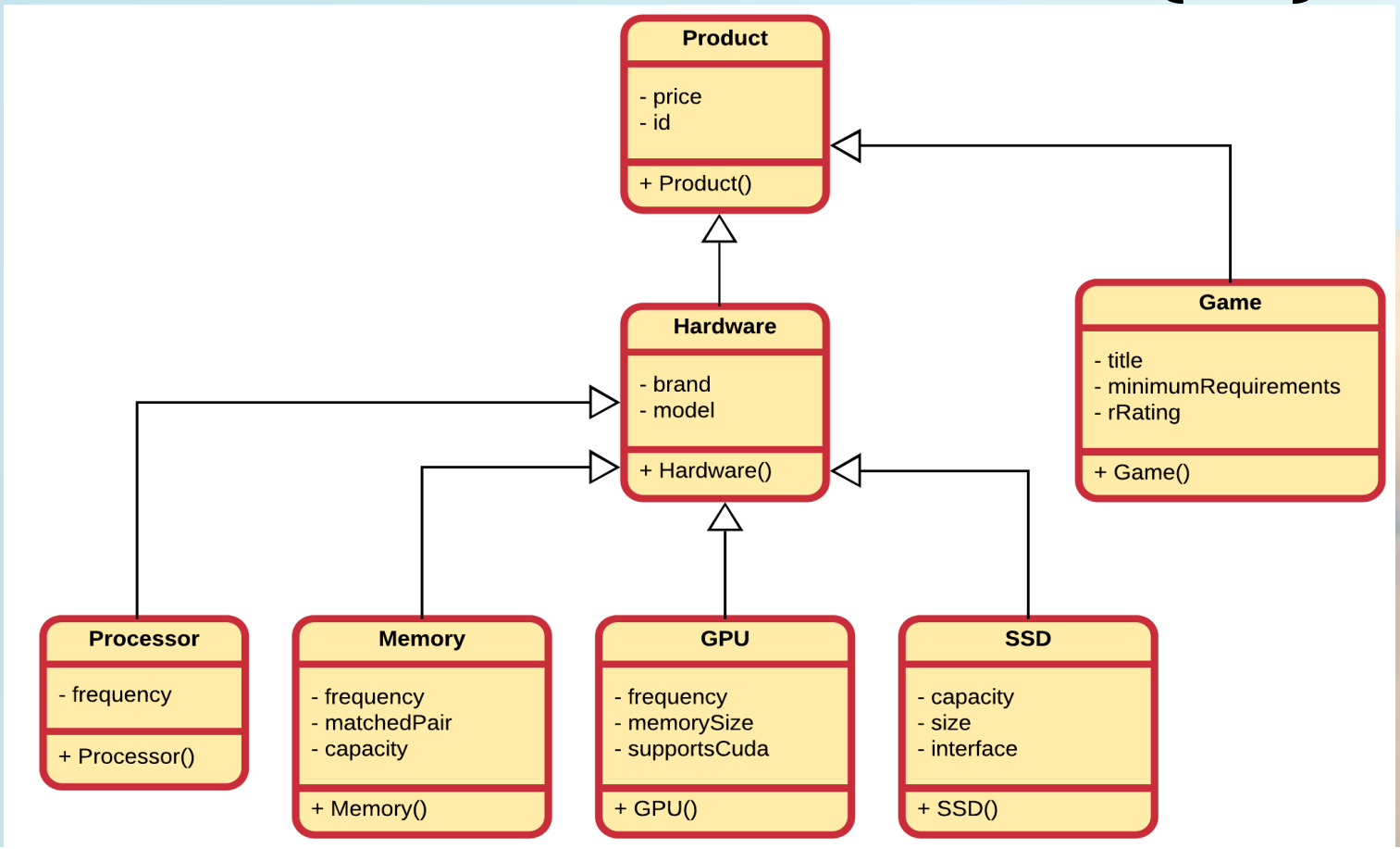
https://bioboost.gitbooks.io/object-oriented-programming-with-cpp/11_inheritance/readme.html

CONTOH INHERITANCE (13)



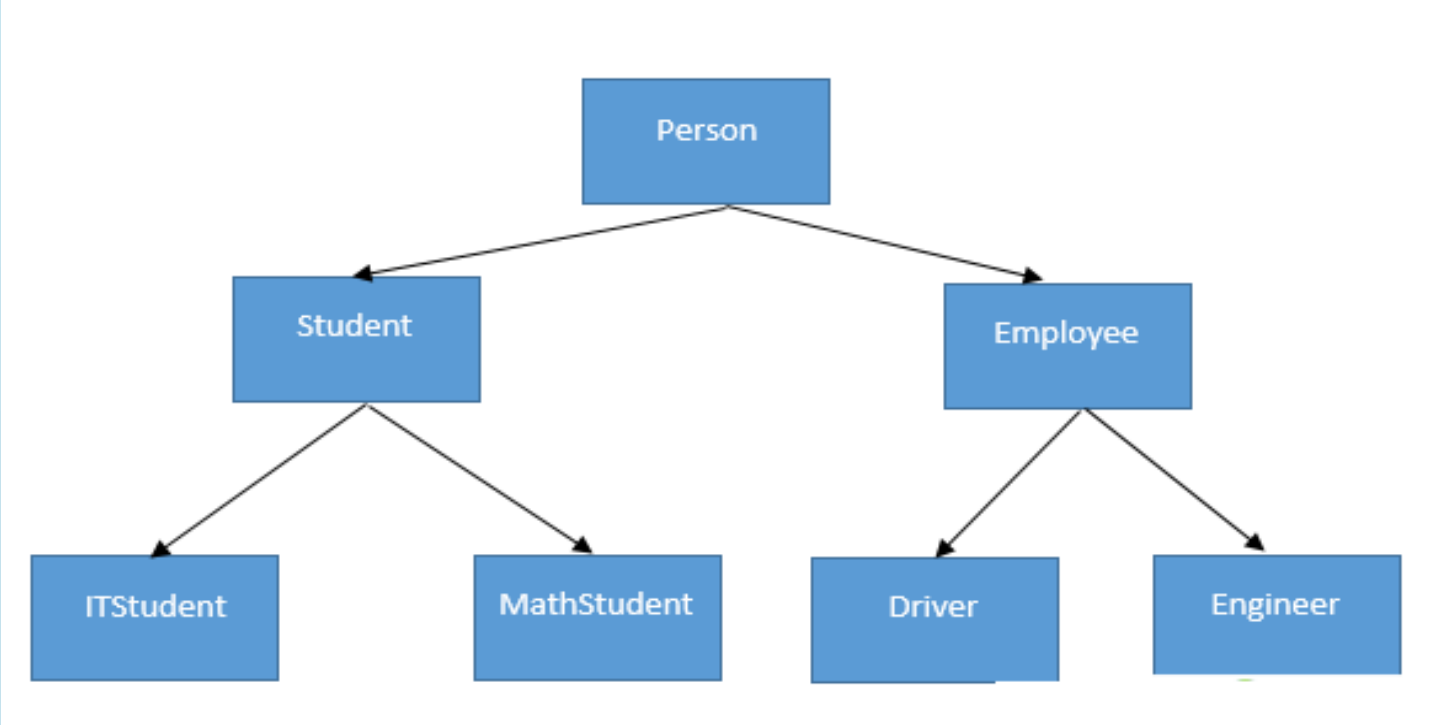
https://bioboost.gitbooks.io/object-oriented-programming-with-cpp/11_inheritance/readme.html

CONTOH INHERITANCE (14)



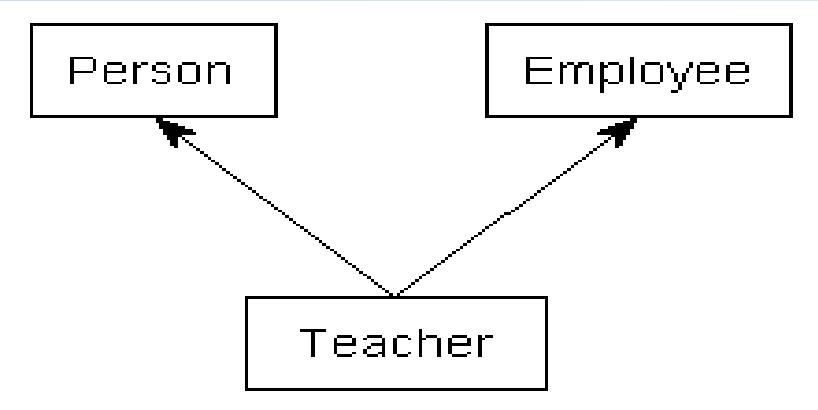
https://bioboost.gitbooks.io/object-oriented-programming-with-cpp/11_inheritance/readme.html

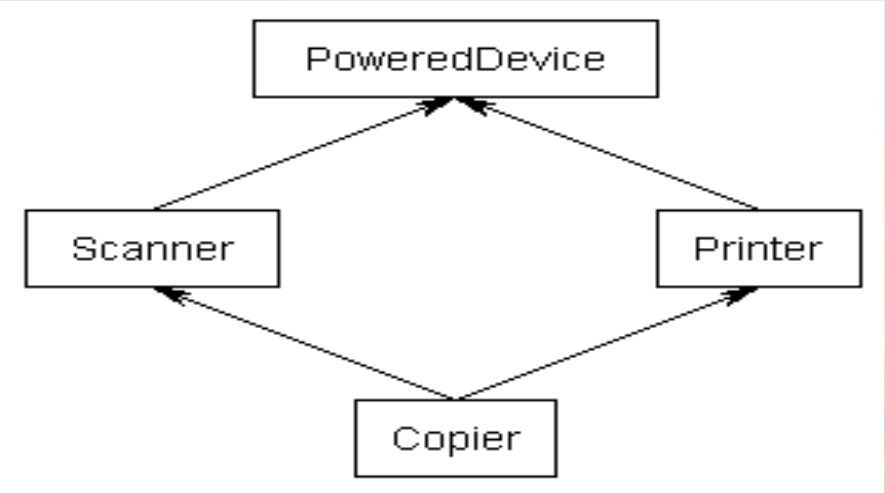
CONTOH INHERITANCE (15)



https://www.tutorialcup.com/cplusplus/inheritance.htm

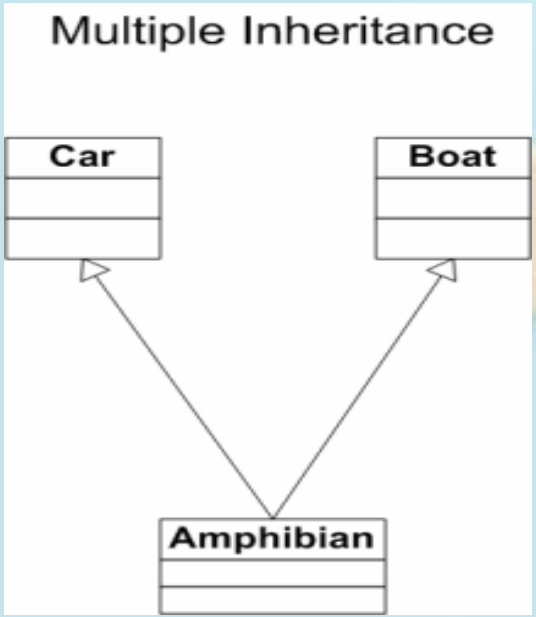
CONTOH MULTIPLE INHERITANCE (1)

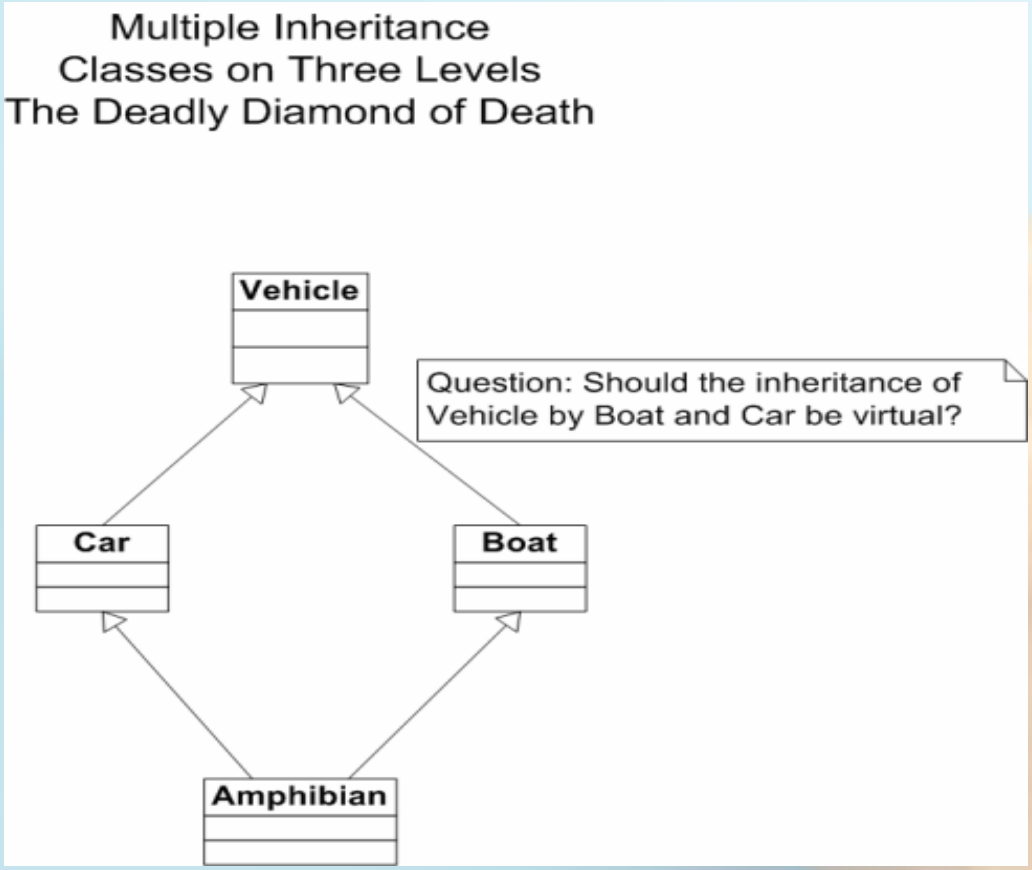




https://www.learncpp.com/cpp-tutorial/117-multiple-inheritance/

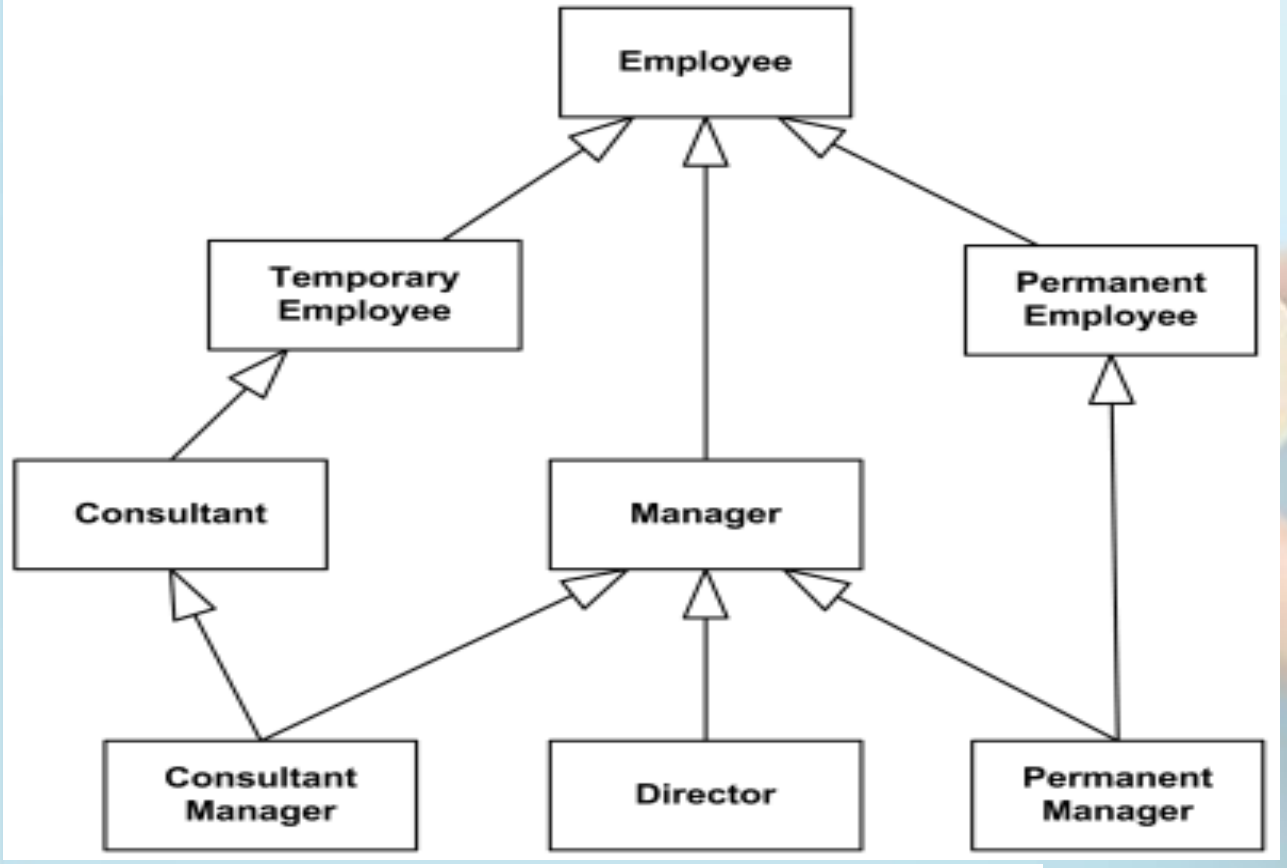
CONTOH MULTIPLE INHERITANCE (2)





http://cs.stmarys.ca/~porter/csc/common_341_342/notes/oop_multiple_inheritance.html

CONTOH MULTIPLE INHERITANCE (3)



https://dachou.github.io/2018/09/13/multiple-inheritance.html

CONTOH SOAL (1)

- **Aksesoris**
- -Kode
- -Jenis
- -PangsaPasar

- **AksesorisPabrikan**
- -Kode
- -KodeBahan
- -Harga

- **AksesorisHandmade**
- -Kode
- -KodeBahan
- -Harga

IndustriKreatif
-NoIjin
-NamaPemilik
-Kota
-Deskripsi

BahanAksesoris
-Kode
-Nama
-Deskripsi

PengusahaAksesoris
-Kode
-Nama
-Kota
-KodeAksesoris

Kain
-Kode
-Nama
-JenisSerat
-Deskripsi

CONTOH SOAL (2)

Arsitek
- KodeArsitek
- Nama
- Kantor
- TahunBekerja

BahanBangunan
- KodeBahan
- KategoriJenisBahan

PenjualBahanBangunan
- NoKTP
- Nama
- NamaToko
- AlamatToko

TokoBangunan
- KodeToko
- NamaToko
- AlamatToko

Semen
- KodeSemen
- NamaSemen
- KodePabrik
- Kualitas
- Harga

Genteng
- KodeGenteng
- NamaGenteng
- KodePabrik
- Kualitas
- Harga

CONTOH SOAL (3)

Arsitek
- KodeArsitek
- Nama
- Kantor
- TahunBekerja

BahanBangunan
- KodeBahan
- KategoriJenisBahan

PenjualBahanBangunan
- NoKTP
- Nama
- NamaToko
- AlamatToko

TokoBangunan
- KodeToko
- NamaToko
- AlamatToko

Semen
- KodeSemen
- NamaSemen
- KodePabrik
- Kualitas
- Harga

Manusia
- NomorKTP
- Nama
- Alamat
- Telepon

Daftar Pustaka