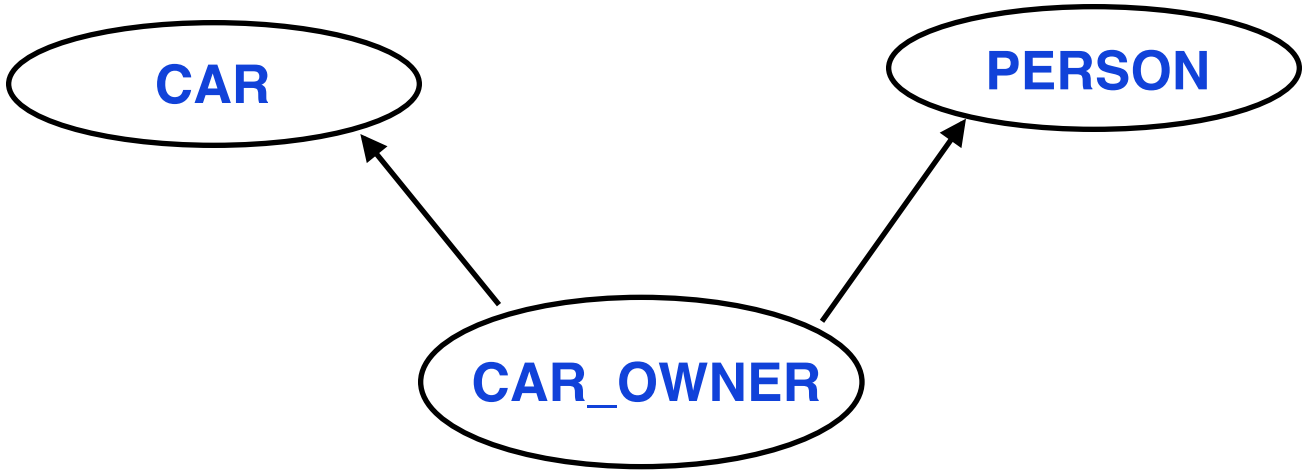
Inheritance vs Uses

How Not to Use Inheritance

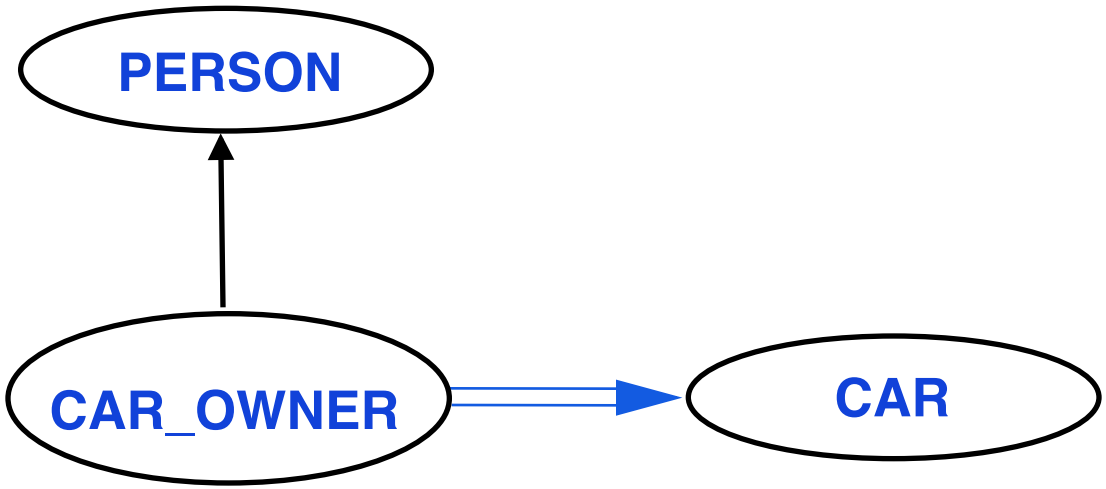
- Class CAR, class PERSON put together to define a new class CAR_OWNER



- Every CAR_OWNER is both a PERSON and a CAR ?

How Not to Use Inheritance – 2

- Correct relationship is client–supplier



Do not make a class B inherit from class A unless you can somehow make the argument that one can view every instance of B also as an instance of A

Use versus Inheritance – 1

- When the **is view** is legitimate, the **has view** can be taken instead

  The reverse is not usually true

  CAR_OWNER

Use versus Inheritance – 2

- When the **is view** is legitimate, the **has view** can be taken instead

  The reverse is not usually true

  CAR_OWNER

- Two criteria help us resolve such arguments

  Though they sometimes fail to give a clear cut solution

Rule of Change

Do not use inheritance for a perceived is_a relation if the corresponding object components may have to be changed at run time.

- Client, has_a, relations permit change, while inheritance does not
  - » **If B inherits from A then every B object is an A object and no object can change this property**
  - » **If a B object has a component of type A it is possible to change that component (up to the constraints supplied by the type system)**

Rule of Polymorphism

Inheritance is appropriate for is_a relations if data structure components of a more general type may need to be attached to objects of more specific type

Use versus Inheritance – 3

- Basic rule
  - » **Client is a has relationship**
  - » **Inheritance is an is_a relationship**

Use versus Inheritance – 4

- Basic rule
  - » **Client is a has relationship**
  - » **Inheritance is an is_a relationship**

- It is a **wicked problem** to decide

  due to difficulties of system modeling

Example

- Every software engineer is an engineer

  class SWENG inherit ENGINEER …

  - **Object relationship cannot be changed dynamically**

Example – 2

- Every software engineer is an engineer

  class SWENG inherit ENGINEER …

  - **Object relationship cannot be changed dynamically**

- In every software engineer there is an engineer

  class SWENG2 feature me : ENGINEER …

  - **new values can be assigned to me – up to type constraints**

Example – 3

- Every software engineer is an engineer

  class SWENG inherit ENGINEER …

  - **Object relationship cannot be changed dynamically**

- In every software engineer there is an engineer

  class SWENG2 feature me : ENGINEER …

  - **new values can be assigned to me – up to type constraints**

- **Every software engineer can have an engineer component**

  class SWENG3 feature me : VOCATION …

  - **Software engineer can also be a juggler**