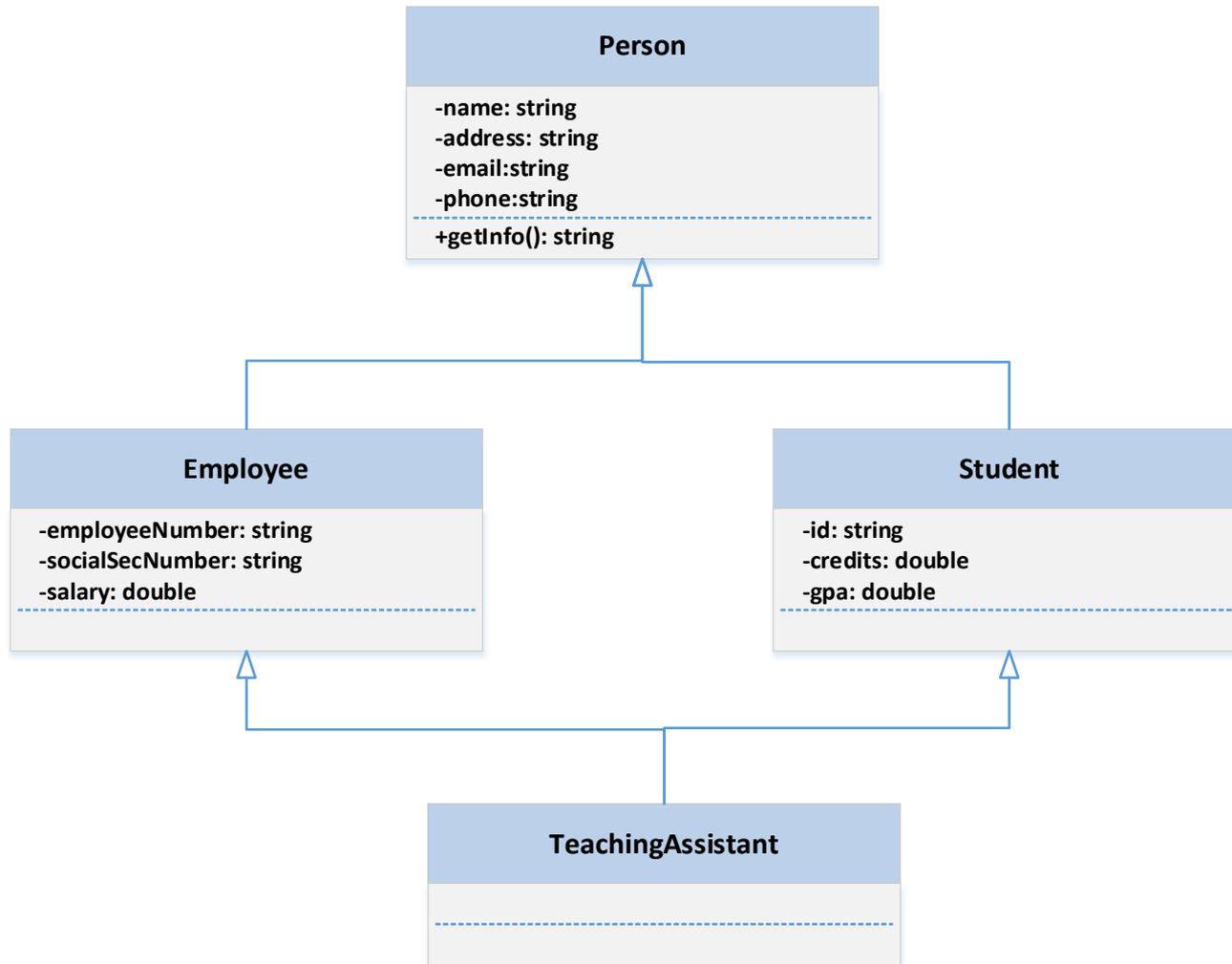


# Diamond Problem with Multiple Inheritance

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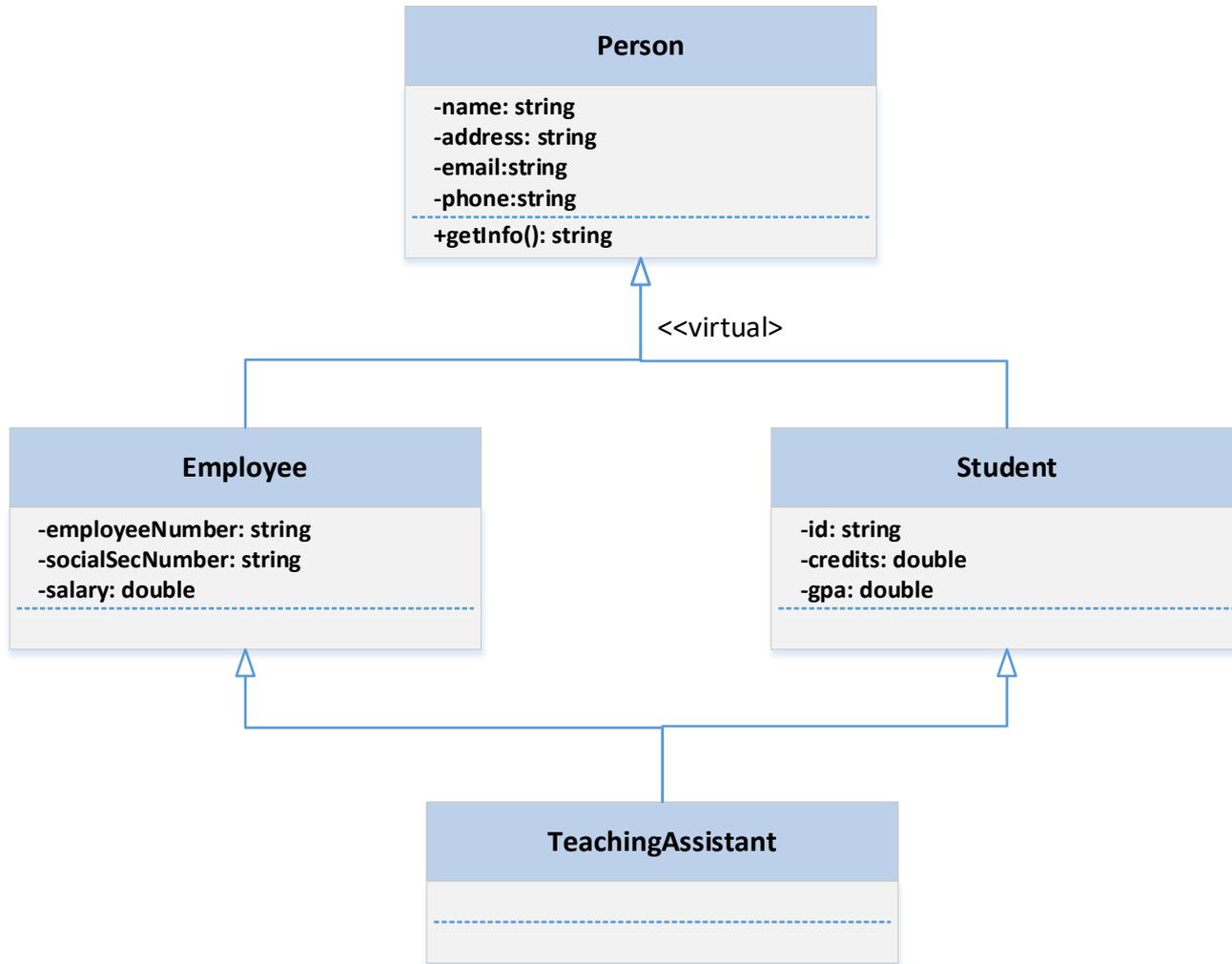
# Diamond Problem with Multiple Inheritance



# Diamond Problem with Multiple Inheritance

- Both **Employee** and **Student** classes inherit **getinfo()** function from **Person** class.
- **TeachingAssistant** class gets **two versions** of **getinfo()** function to inherit from; **one** from **Employee** class and the **other** from **Student** class.
- An **ambiguous situation** to the compiler, and it will **generate an error**.
- This phenomenon with multiple inheritance is called **diamond problem**.

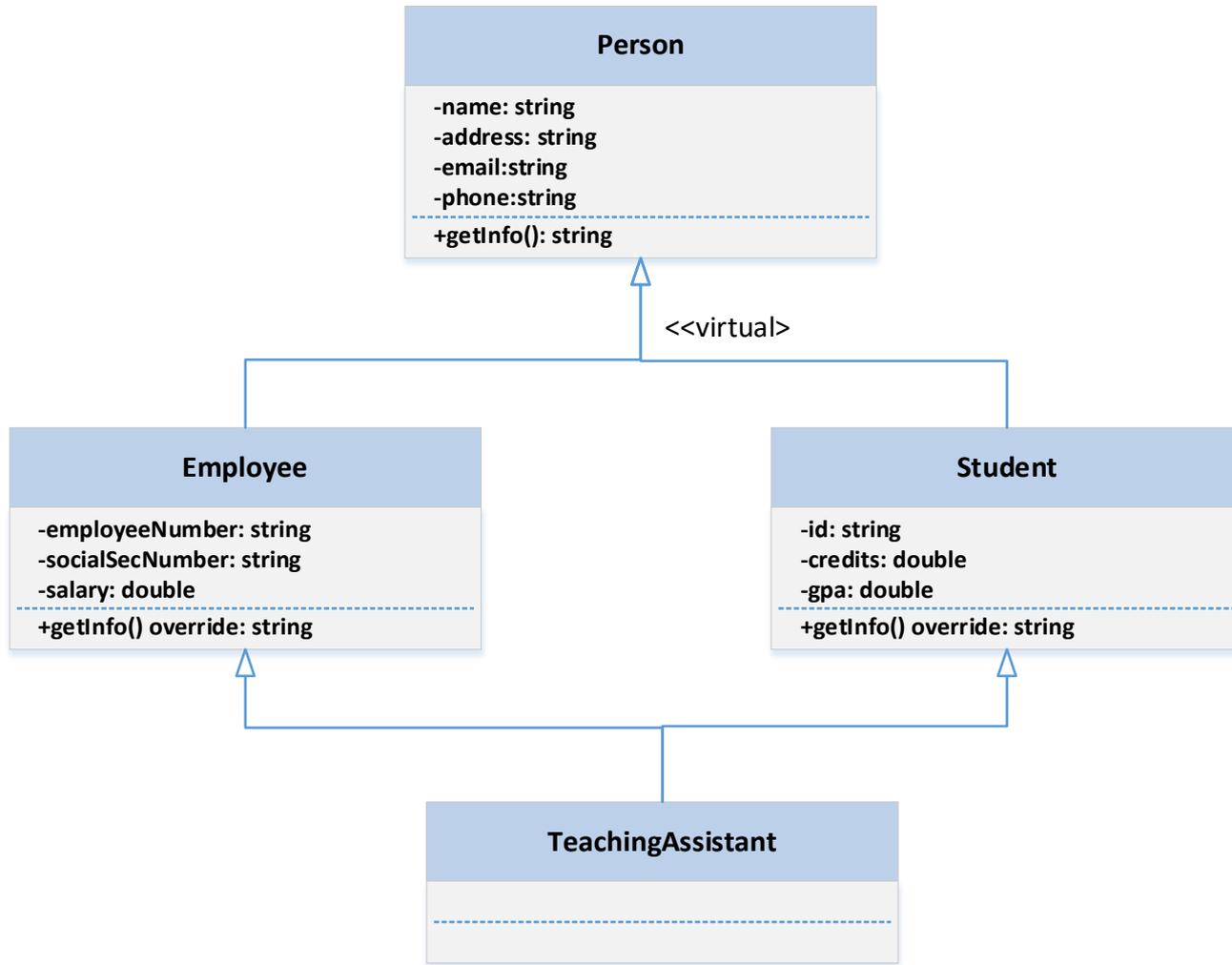
# Diamond Problem with Multiple Inheritance



# Diamond Problem with Multiple Inheritance

- After declaring the **Person** class a **virtual base** class, if both **Employee** and **Student** classes inherit **getinfo()** function from **Person** class, **TeachingAssistant** class **no** longer get **two versions** of **getinfo()** function to inherit from; two versions resolves to one due to the above virtual base class declaration.
- **Ambiguity** to the compiler has been resolved, i.e., **diamond problem** resolved.

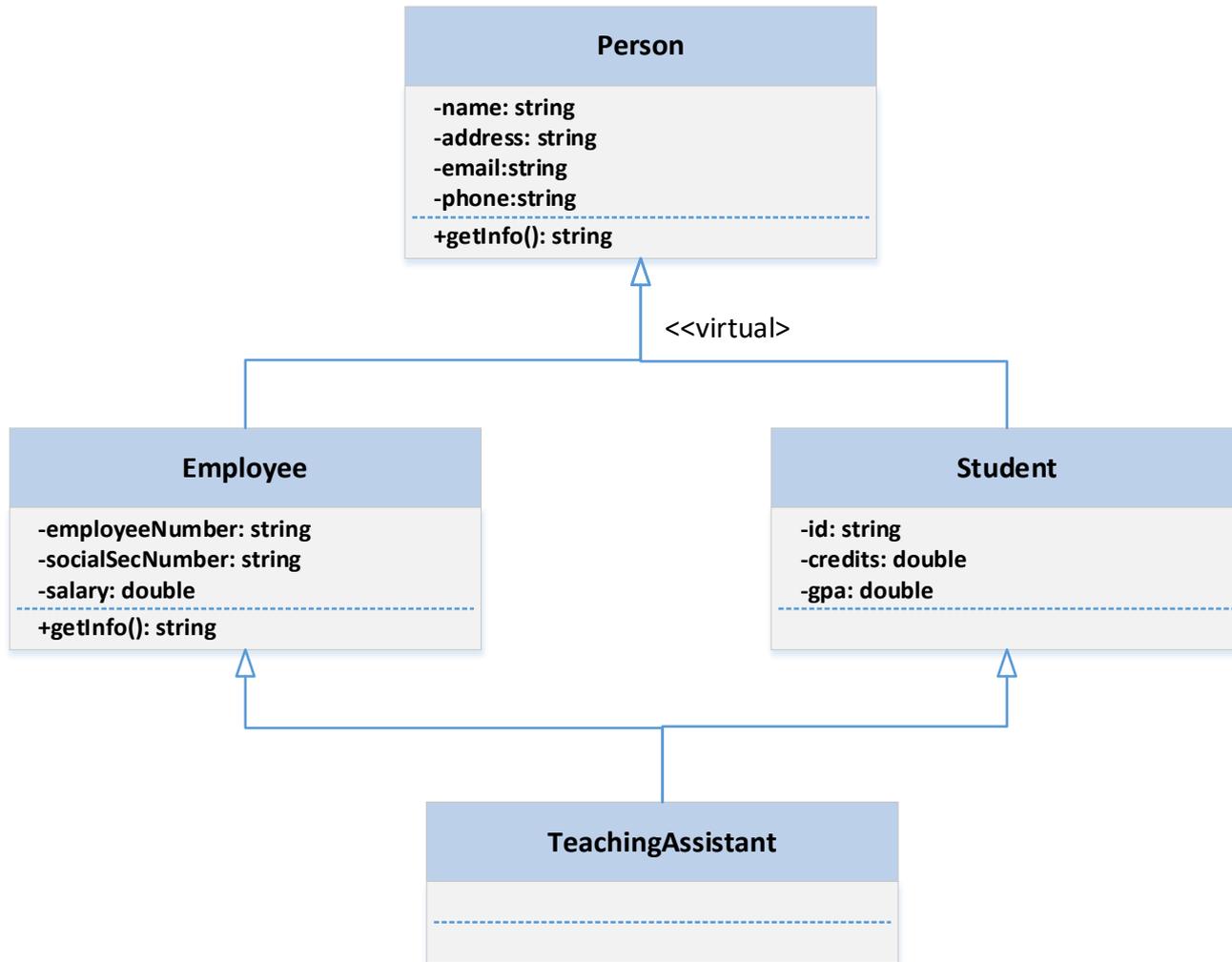
# Diamond Problem with Multiple Inheritance



# Diamond Problem with Multiple Inheritance

- Even after declaring the **Person** class a **virtual base** class, if both **Employee** and **Student** classes override **getinfo()** function, **TeachingAssistant** class again gets **two versions** of **getinfo()** function to inherit from.
- Again, an **ambiguous situation** to the compiler, i.e., again exhibiting **diamond problem**.

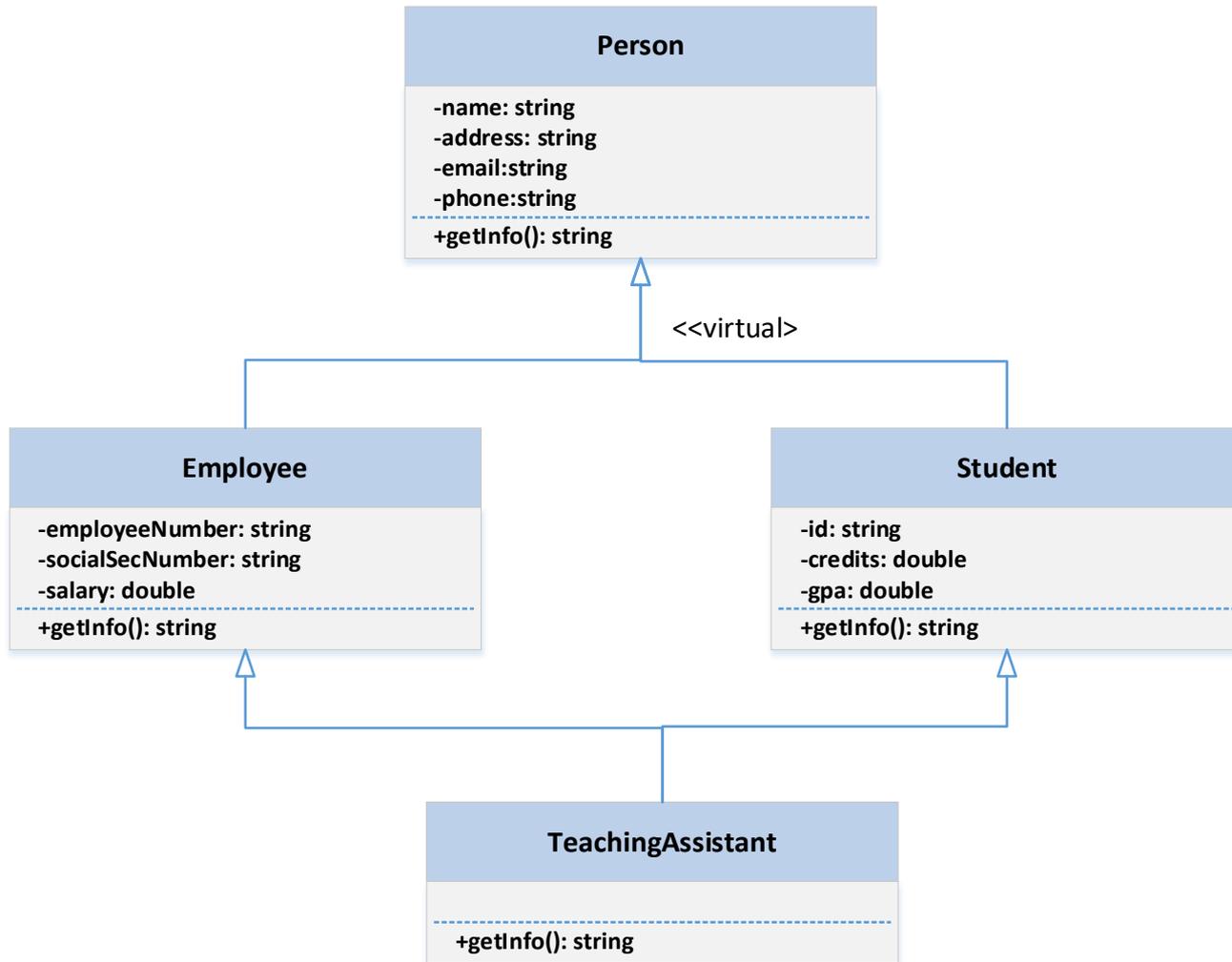
# Diamond Problem with Multiple Inheritance



# Diamond Problem with Multiple Inheritance

- After declaring the **Person** class a **virtual base** class, if only **Employee** class overrides **getinfo()** function and **Student** class inherits it from **Person** class, the **getinfo()** version of **Employee** class becomes preferred for **TeachingAssistant** class's inheritance over that of **Student** class.
- Because the **getinfo()** function of **Employee** class is not an inherited but an overridden version and the **getinfo()** function of **Student** class is an inherited version.
- This is definitely an **unambiguous situation** to the compiler, i.e., not exhibiting **diamond problem**.
- However, this is **not a natural solution** to the diamond problem.

# Diamond Problem with Multiple Inheritance



# Diamond Problem with Multiple Inheritance

- After declaring the **Person** class a **virtual base** class, if both **Employee** and **Student** classes override **getinfo()** function, **TeachingAssistant** class again gets **two versions** of **getinfo()** function to inherit; **one** from **Employee** class and the **other** from **Student** class.
- Again, an **ambiguous situation** to the compiler.
- **TeachingAssistant** class can **resolve the ambiguity** by **overriding** the **getinfo()** function instead of inheriting it.