

Nesneye Yönelik Programlama

BLM2012



Öğr. Grv. Furkan ÇAKMAK

Ders Tanıtım Formu ve Konular

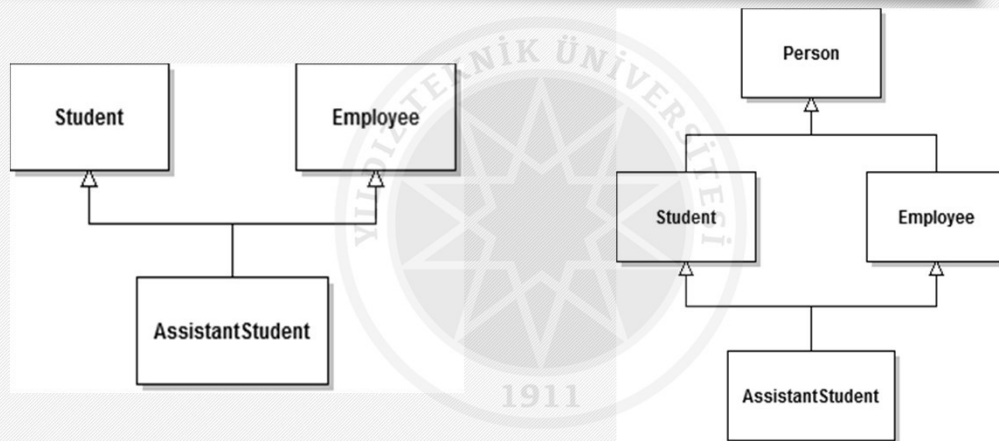
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Nesneye
Yönelik
Programlama
Hafta 6

| Hafta | Tarih | Konular |
|-------|------------|--|
| 1 | 01.03.2022 | Dersin ve Java Dilinin Genel Tanıtımı, Sınıflar, Nesneler, Üyeler, Final ve Static Kavraları |
| 2 | 08.03.2022 | UML Sınıf Şemaları, Kurucular ve Sonlandırıcılar, Denetim Akışı, Nesneleri Oluşturulması |
| 3 | 15.03.2022 | Kurucuların ve Metotların Çoklu Tanımlanması, İlkeler, String ve Math Sınıfları |
| 4 | 22.03.2022 | Sahiplik ve Kullanma İlişkileri, Tek Yönlü ve İki Yönlü Sahiplik Kavramları |
| 5 | 29.03.2022 | Kalıtım, Metotların Yeniden Tanımlanması ve Çoklu Metot Tanımlamadan Farkı |
| 6 | 05.04.2022 | NYP'da Özel Konular: Abstract Classes, Interfaces, Enum Sınıfları |
| 7 | 12.04.2022 | Exception Handling, Unit Test |
| 8 | 19.04.2022 | 1. Ara Sınav |
| 9 | 26.04.2022 | Temel Veri Yollarının Jenerik Sınıflar Eşliğinde Kullanımı (Liste ve Eşleme Yapıları). |
| 10 | 03.05.2022 | Ramazan Bayramı |
| 11 | 10.05.2022 | Dosyalar ve Akışlar ile Çalışmak (Serileştirme ve Ters İşlemi) |
| 12 | 17.05.2022 | Tip dönüşüm, Enum Sınıfları, İç Sınıflar |
| 13 | 24.05.2022 | 2. Ara Sınav |
| 14 | 31.05.2022 | Paralel Programlamaya Giriş |

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Multiple Inheritance

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Nesneye
Yönelik
Programlama
Hafta 6



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Abstract Classes

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Yönelik
Programlama
Hafta 6

- An abstract class is such a class that it is used as a base class and it represents a template for its regular sub classes.
 - If a class is abstract, we identify it with the keyword abstract.
- It is forbidden to create instances of an abstract class.
- Abstract classes can have member fields, just like the concrete classes.
- Abstract classes can have both concrete and abstract member methods.
 - An abstract method has only definition together with the keyword abstract, it does not have a body.

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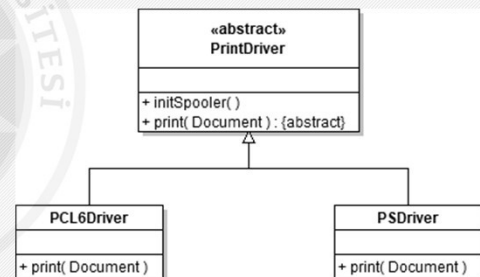
Abstract Classes (Con't)

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Yönelik
Programlama
Hafta 6

- When do we need abstract classes?
- You can mark the abstract classes in UML class schemas in italics or by adding the <<Abstract>> stereotype.

- <<...>>: This is called a stereotype.

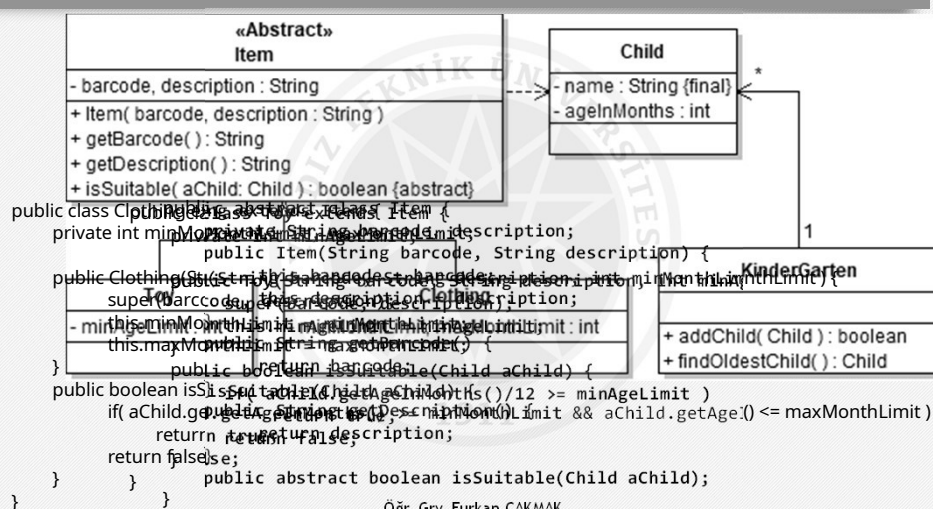
```
public abstract class PrintDriver {
    public void initSpooler() {
        /* necessary codes*/
    }
    public abstract void print( Document doc );
}
public class PCL6Driver extends PrintDriver {
    public void print(Document doc) {
        //necessary code is inserted here
    }
}
```



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Abstract Classes: Example

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Programlama
Hafta 6

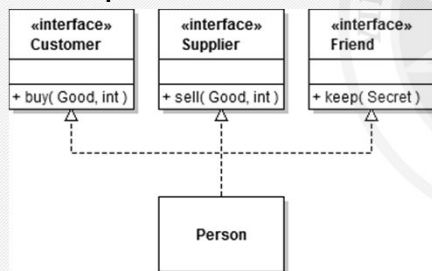


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Interfaces

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Yönelik
Programlama
Hafta 6

- Interfaces can be thought as abstract classes **without** members.
 - If you wish, you may add "public final static" member fields only.
- An interface is a named collection of methods.
- UML representation and source code of an example:



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```

public interface Customer {
    public void buy( Good aGood, int quantity );
}
public interface Supplier {
    public void sell( Good aGood, int quantity );
}
public interface Friend {
    public void keep( Secret aSecret );
}
public class Person implements Customer,
    Supplier, Friend {
    public void buy( Good aGood, int quantity ) {
        //related code
    }
    public void sell (Good aGood, int quantity ) {
        // related code
    }
    public void keep( Secret aSecret ) {
        // related code
    }
}
  
```

Interfaces (Con't)

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Nesneye
Yönelik
Programlama
Hafta 6

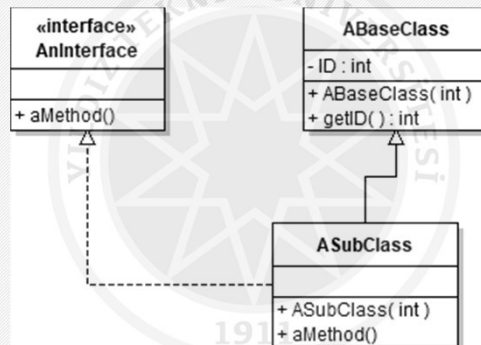
- We use interfaces ..
 - in order to group responsibilities of entities,
 - in order to give objects multiple views,
 - instead of inheritance,
 - Because inheritance is a "heavy weight" relation that should be used only when it is absolutely necessary.
 - instead of multiple inheritance.
- Rules related to interfaces:
 - A class should code the bodies of all the methods of the implemented interfaces.
 - Regular member fields cannot be defined in interfaces. Interfaces can only have "public final static" member fields.
 - Only public methods can be defined in interfaces.
 - Interfaces cannot have constructors.
 - A class can implement multiple interfaces.
 - Suggestion: Begin naming interfaces with I (capital i).

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Yönelik
Programlama
Hafta 6

- Interface implementation and inheritance can be used together when needed:



```

public class ASubCbClass extends ABaseClass implements AnInterface {
    // it should be easy to code the rest for you
}
  
```

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DESIGNING AND CODING INTERFACES

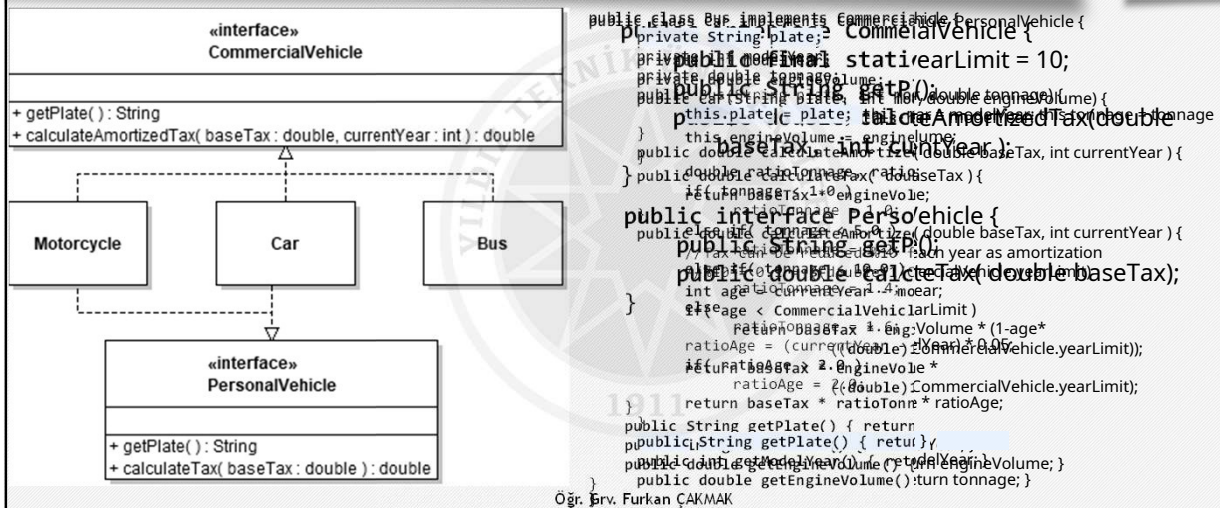
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Yönelik
Programlama
Hafta 6

- Consider the following requirement about calculating the taxes of vehicles:
 - Taxation of commercial and personal vehicles is different.
 - Motorcycles, cars and buses can be registered as commercial vehicles.
 - Only motorcycles and cars can be registered as personal vehicles.
 - Only taxes of commercial vehicles can be amortized.
 - Commercial or not, calculation of the tax of different vehicles (car, bus, etc.) are very different.
- How can we model this requirement?
- Hint: If the tax calculation for different vehicles were similar (i.e. parametrized), using one abstract base class instead of interfaces would be a better choice.
- PS: We will code a year limit for maximum amortization in the CommercialVehicle interface but VioletUML doesn't let us draw this in here.

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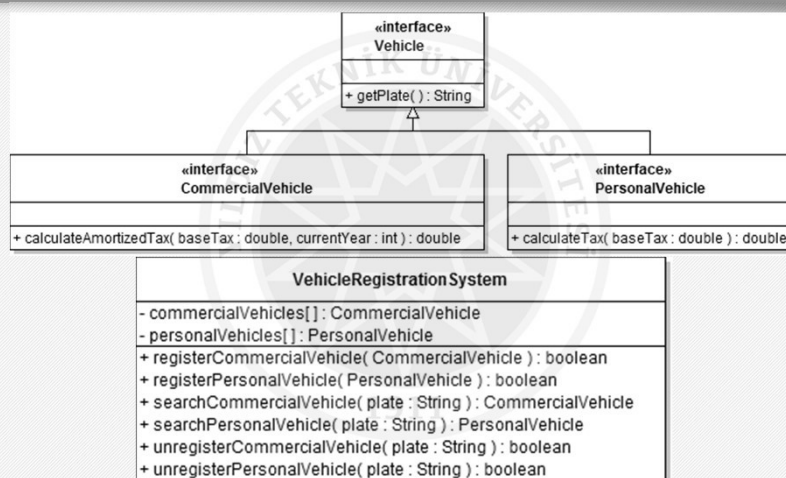
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Nesneye
Yönelik
Programlama
Hafta 6



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Nesneye
Yönelik
Programlama
Hafta 6



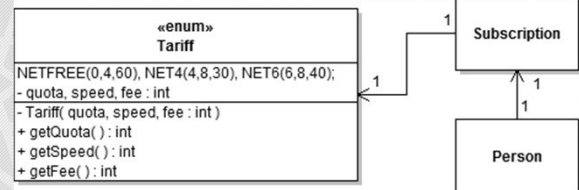
PRIMITIVE ENUMERATIONS and ENUM CLASSES

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Yönelik
Programlama
Hafta 6

```
public enum Tariff {
    NETFREE(0,4,60), NET4(4,8,30), NET6(6,8,40);
    private int quota, speed, fee;
    public Tariff(int quota, int speed, int fee) {
        this.quota = quota; this.speed = speed; this.fee = fee;
    }
    public int getQuota() { return quota; }
    public int getSpeed() { return speed; }
    public int getFee() { return fee; }
}

Size s = Size.MEDIUM;

public class Test {
    public static void main(String[] args) {
        Tariff tariff4 = Tariff.NET4;
        Person yunus = new Person("Yunus Emre");
        yunus.subscribeTo(tariff4);
        Person berkin = new Person("Berkin Gülay");
        berkin.subscribeTo(Tariff.NETFREE);
        System.out.println(yunus);
        System.out.println(berkin);
    }
}
```



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Sabırla Dinlediğiniz İçin Teşekkürler

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Programlama
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