

# XSD Schema

## Defining a Simple Element

```
<lastname>Refsnes</lastname>
```

```
<age>36</age>
```

```
<dateborn>1970-03-27</dateborn>
```

```
<xs:element name="lastname" type="xs:string"/>
```

```
<xs:element name="color" type="xs:string" default="red"/>
```

```
<xs:element name="color" type="xs:string" fixed="red"/>
```

## How to Define an Attribute?

```
<lastname lang="EN">Smith</lastname>
```

```
<xs:attribute name="lang" type="xs:string"/>
```

```
<xs:attribute name="lang" type="xs:string" default="EN"/>
```

```
<xs:attribute name="lang" type="xs:string" fixed="EN"/>
```

```
<xs:attribute name="lang" type="xs:string" use="required"/>
```

## Restrictions on Values

```
<xs:element name="age">
```

```
  <xs:simpleType>
```

```
    <xs:restriction base="xs:integer">
```

```
      <xs:minInclusive value="0"/>
```

```
      <xs:maxInclusive value="120"/>
```

```
    </xs:restriction>
```

```
  </xs:simpleType>
```

```
</xs:element>
```

```
<xs:element name="car">
```

```
  <xs:simpleType>
```

```
    <xs:restriction base="xs:string">
```

```
      <xs:enumeration value="Audi"/>
```

```
      <xs:enumeration value="Golf"/>
```

```
      <xs:enumeration value="BMW"/>
```

```
    </xs:restriction>
```

```
  </xs:simpleType>
```

```
</xs:element>
```

```
<xs:element name="car" type="carType"/>
```

```
<xs:simpleType name="carType">  
  <xs:restriction base="xs:string">  
    <xs:enumeration value="Audi"/>  
    <xs:enumeration value="Golf"/>  
    <xs:enumeration value="BMW"/>  
  </xs:restriction>  
</xs:simpleType>
```

## Examples of Complex Elements

```
<employee>  
  <firstname>John</firstname>  
  <lastname>Smith</lastname>  
</employee>
```

```
<xs:element name="employee">  
  <xs:complexType>  
    <xs:sequence>  
      <xs:element name="firstname" type="xs:string"/>  
      <xs:element name="lastname" type="xs:string"/>  
    </xs:sequence>  
  </xs:complexType>  
</xs:element>
```

```
<xs:element name="employee" type="personinfo"/>  
<xs:element name="student" type="personinfo"/>  
<xs:element name="member" type="personinfo"/>
```

```
<xs:complexType name="personinfo">  
  <xs:sequence>  
    <xs:element name="firstname" type="xs:string"/>  
    <xs:element name="lastname" type="xs:string"/>  
  </xs:sequence>  
</xs:complexType>
```

```
<xs:element name="employee" type="fullpersoninfo"/>
```

```
<xs:complexType name="personinfo">  
  <xs:sequence>  
    <xs:element name="firstname" type="xs:string"/>
```

```

        <xs:element name="lastname" type="xs:string"/>
    </xs:sequence>
</xs:complexType>

<xs:complexType name="fullpersoninfo">
    <xs:complexContent>
        <xs:extension base="personinfo">
            <xs:sequence>
                <xs:element name="address" type="xs:string"/>
                <xs:element name="city" type="xs:string"/>
                <xs:element name="country" type="xs:string"/>
            </xs:sequence>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>

<product prodid="1345" />

<xs:element name="product">
    <xs:complexType>
        <xs:complexContent>
            <xs:restriction base="xs:integer">
                <xs:attribute name="prodid" type="xs:positiveInteger"/>
            </xs:restriction>
        </xs:complexContent>
    </xs:complexType>
</xs:element>

<xs:element name="product">
    <xs:complexType>
        <xs:attribute name="prodid" type="xs:positiveInteger"/>
    </xs:complexType>
</xs:element>

<xs:element name="product" type="prodtype"/>

<xs:complexType name="prodtype">
    <xs:attribute name="prodid" type="xs:positiveInteger"/>
</xs:complexType>

<shoesize country="france">35</shoesize>

```

```

<xs:element name="shoesize">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="xs:integer">
        <xs:attribute name="country" type="xs:string" />
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>

<letter>
  Dear Mr. <name>John Smith</name>.
  Your order <orderid>1032</orderid>
  will be shipped on <shipdate>2001-07-13</shipdate>.
</letter>

<xs:element name="letter" type="lettertype"/>

<xs:complexType name="lettertype" mixed="true">
  <xs:sequence>
    <xs:element name="name" type="xs:string"/>
    <xs:element name="orderid" type="xs:positiveInteger"/>
    <xs:element name="shipdate" type="xs:date"/>
  </xs:sequence>
</xs:complexType>

```

## Indicators

Order indicators:

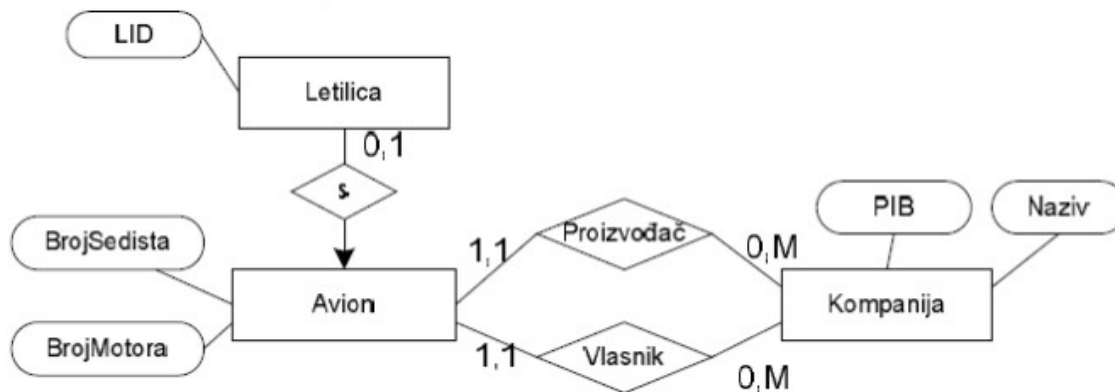
- All
- Choice
- Sequence

Occurrence indicators:

- maxOccurs
- minOccurs

# ZADACI

1. Za dati model objekti-veze:



- Napisati XML model zapisan pomoću XML sheme, kojim se najbolje oslikava dati model.
- Napisati primer validnog XML dokumenta koji sadrži sve elemente date u XML shemi.
- Napisati Xpath ili Xquery kojim se prikazuju svi avioni koji su u vlasništvu kompanije koja ih je proizvela.

a.

```

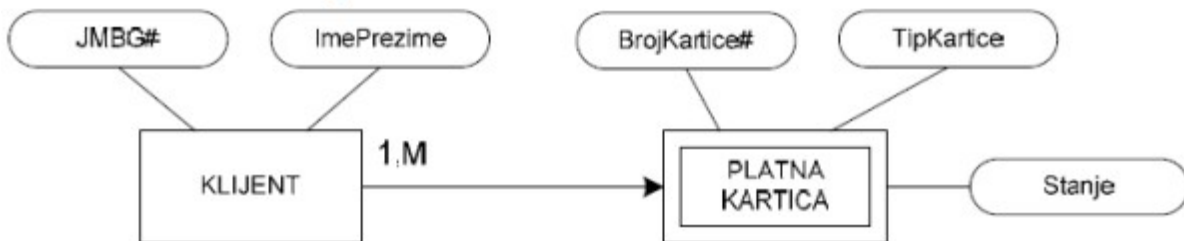
<?xml version="1.0" encoding="UTF-8"?>
- <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  - <xs:element name="model">
    - <xs:complexType>
      - <xs:sequence>
        <xs:element name="Kompanija" maxOccurs="unbounded" minOccurs="0" type="KompanijaTip"/>
        <xs:element name="Avion" maxOccurs="unbounded" minOccurs="0" type="AvionTip"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  - <xs:complexType name="LetelicaTip">
    <xs:attribute name="LID" type="xs:ID" use="required"/>
  </xs:complexType>
  - <xs:complexType name="AvionTip">
    - <xs:complexContent>
      - <xs:extension base="LetelicaTip">
        <xs:attribute name="brojSedista" type="xs:int"/>
        <xs:attribute name="brojMotora" type="xs:int"/>
        <xs:attribute name="IDproizvodjac" type="xs:IDref" use="required"/>
        <xs:attribute name="IDvlasnik" type="xs:IDref" use="required"/>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>
  - <xs:complexType name="KompanijaTip">
    <xs:attribute name="PIB" type="xs:ID" use="required"/>
    <xs:attribute name="Naziv" type="xs:string"/>
  </xs:complexType>
</xs:schema>
  
```

b.

```
<?xml version="1.0" encoding="UTF-8"?>
- <model xmlns:xsi="http://www.w3.org/2009/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="D:\NASTAVA\pbb\pbbXMLbaze">
  <Kompanija PIB="K11" Naziv="Boeing"/>
  <Kompanija PIB="K22" Naziv="JAT"/>
  <Avion brojSedista="225" brojMotora="Motor11" LID="A01" IDproizvodjac="K11" IDvlasnik="K22"/>
  <Avion brojSedista="225" brojMotora="Motor12" LID="A02" IDproizvodjac="K11" IDvlasnik="K11"/>
</model>
```

c. //Avion[@IDvlasnik=@IDproizvodjac]

2. Za dati model objekti-veze:



- Napisati XML model zapisan pomoću XML sheme, kojim se najbolje oslikava dati model.
- Napisati primer validnog XML dokumenta koji sadrži sve elemente date u XML shemi.
- Definisati XML schema ograničenje jedinstvenosti za atribut ImePrezime

REŠENJE:

a.

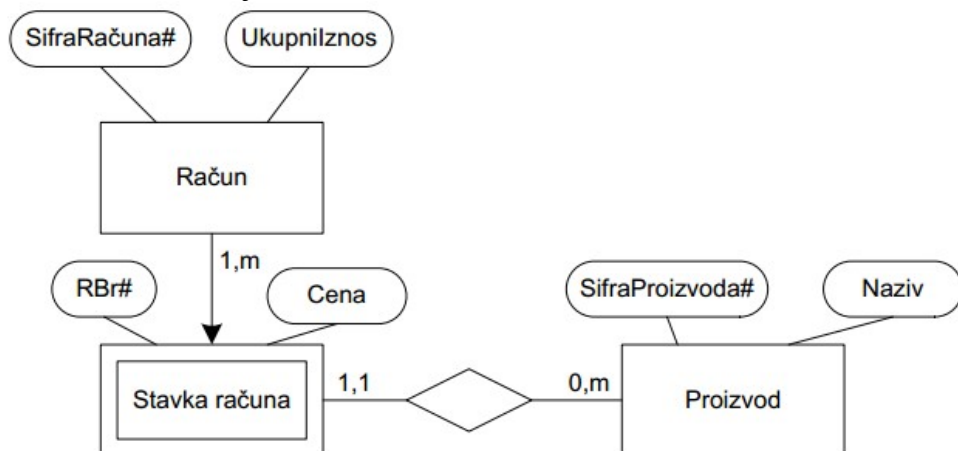
```
<?xml version="1.0" encoding="UTF-8"?>
- <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  - <xs:element name="Klijenti">
    - <xs:complexType>
      - <xs:sequence>
        - <xs:element name="Klijent">
          - <xs:complexType>
            - <xs:sequence>
              <xs:element name="JMBG" type="xs:ID"/>
              <xs:element name="ImePrezime" type="xs:string"/>
              - <xs:element name="PlatnaKartica" maxOccurs="unbounded">
                - <xs:complexType>
                  - <xs:sequence>
                    <xs:element name="BrojKartice" type="xs:ID"/>
                    <xs:element name="TipKartice" type="xs:string"/>
                    <xs:element name="Stanje" type="xs:float"/>
                  </xs:sequence>
                </xs:complexType>
              </xs:element>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

b.

```
<?xml version="1.0" encoding="UTF-8"?>
- <Klijenti xmlns:xsi="http://www.w3.org/2009/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="D:\NASTAVA\pbbp\pbbpXMLbaze\platnaKartica.xsd">
  - <Klijent>
    <JMBG>1212956121212</JMBG>
    <ImePrezime>Marko Markovic</ImePrezime>
    - <PlatnaKartica>
      <BrojKartice>17</BrojKartice>
      <TipKartice>Kreditna</TipKartice>
      <Stanje>100000.00</Stanje>
    </PlatnaKartica>
    - <PlatnaKartica>
      <BrojKartice>18</BrojKartice>
      <TipKartice>Visa</TipKartice>
      <Stanje>12500.10</Stanje>
    </PlatnaKartica>
  </Klijent>
</Klijenti>
```

c. `<xs:unique name="JedinstvenostZaImePrezime">`  
`<xs:selector xpath="Klijent"/>`  
`<xs:field xpath="ImePrezime"/>`  
`</xs:unique>`

3. Za dati model objekti-veze:



- Napisati XML model zapisan pomoću XML sheme, kojim se najbolje oslikava dati model.
- Napisati primer validnog XML dokumenta koji sadrži sve elemente date u XML shemi.
- Napisati Xquery kojim se prikazuju svi računi koji sadrže proizvod "Coca-cola" i čiji je ukupan iznos veći od 200.

REŠENJE:



```

<?xml version="1.0" encoding="UTF-8"?>
- <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  - <xs:element name="model">
    - <xs:complexType>
      - <xs:sequence maxOccurs="unbounded" minOccurs="0">
        <xs:element name="Proizvod" type="ProizvodTip"/>
        <xs:element name="Racun" type="RacunTip"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  - <xs:complexType name="ProizvodTip">
    <xs:element name="Naziv" type="xs:string"/>
    <xs:attribute name="SifraProizvoda" type="xs:ID" use="required"/>
  </xs:complexType>
  - <xs:complexType name="RacunTip">
    - <xs:sequence>
      - <xs:element name="StavkaRacuna" maxOccurs="unbounded">
        - <xs:complexType>
          <xs:element name="Cena" type="xs:int"/>
          <xs:attribute name="RBr" type="xs:ID" use="required"/>
          <xs:attribute name="IDProizvoda" type="xs:IDref" use="required"/>
        </xs:complexType>
      </xs:element>
      <xs:element name="UkupniIznos" type="xs:float"/>
    </xs:sequence>
    <xs:attribute name="SifraRacuna" type="xs:ID" use="required"/>
  </xs:complexType>
</xs:schema>

```

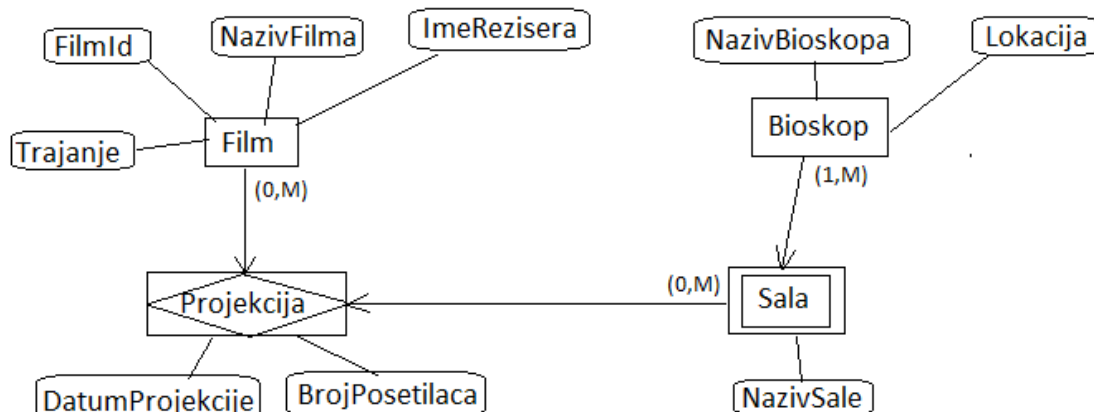
b.

```
<?xml version="1.0" encoding="UTF-8"?>
- <model xmlns:xsi="http://www.w3.org/2009/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="D:\NASTAVA\pbbp\pbbpXMLbaze\racun.xsd">
  - <Proizvod SifraProizvoda="90">
    <Naziv>Smoki</Naziv>
  </Proizvod>
  - <Proizvod SifraProizvoda="7">
    <Naziv>Coca-cola</Naziv>
  </Proizvod>
  - <Proizvod SifraProizvoda="12">
    <Naziv>Mlečna čokolada</Naziv>
  </Proizvod>
  - <Racun SifraRacuna="123">
    - <StavkaRacuna IDProizvoda="90" RBr="1">
      <Cena>65.50</Cena>
    </StavkaRacuna>
    - <StavkaRacuna IDProizvoda="7" RBr="2">
      <Cena>89.90</Cena>
    </StavkaRacuna>
    - <StavkaRacuna IDProizvoda="12" RBr="3">
      <Cena>110.15</Cena>
    </StavkaRacuna>
    <UkupniIznos>265.55</UkupniIznos>
  </Racun>
</model>
```

c.

```
for $proizvod in //Proizvod[Naziv="Coca-cola"]
let $racun := //Racun[UkupniIznos>200 and StavkaRacuna/@IDProizvoda
= $proizvod/@SifraProizvoda]
return $racun
```

4. Za dati model objekti-veze:



- Napisati XML model zapisan pomoću XML sheme, kojim se najbolje oslikava dati model.
- Napisati primer validnog XML dokumenta koji sadrži sve elemente date u XML shemi.
- Napisati Xquery kojim se prikazuje ukupan broj projekcija u sali "Marilyn Monroe".

a.

```
<?xml version="1.0" encoding="UTF-8"?>
- <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  - <xs:element name="BioskopskiRepertoar">
    - <xs:complexType>
      - <xs:choice maxOccurs="unbounded">
        <xs:element name="Film" type="FilmTip"/>
        <xs:element name="Bioskop" type="BioskopTip"/>
      </xs:choice>
    </xs:complexType>
  - <xs:complexType name="FilmTip">
    - <xs:sequence>
      <xs:element name="NazivFilma" type="xs:string"/>
      <xs:element name="ImeRežisera" maxOccurs="unbounded" type="xs:string"/>
      <xs:element name="Trajanje" type="xs:int" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="FilmId" type="xs:ID" use="required"/>
  </xs:complexType>
  - <xs:complexType name="BioskopTip">
    - <xs:sequence>
      <xs:element name="NazivBioskopa" type="xs:string"/>
      <xs:element name="Lokacija" type="xs:string"/>
      - <xs:element name="Sala" maxOccurs="unbounded">
        - <xs:complexType>
          - <xs:sequence>
            <xs:element name="NazivSale" type="xs:string"/>
            - <xs:element name="Projekcija" maxOccurs="unbounded" minOccurs="0">
              - <xs:complexType>
                - <xs:sequence>
                  <xs:element name="DatumProjekcije" type="xs:date"/>
                  <xs:element name="BrojPosetilaca" type="xs:int"/>
                </xs:sequence>
                  <xs:attribute name="FilmId" type="xs:IDRef" use="required"/>
                </xs:complexType>
              </xs:element>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:sequence>
</xs:complexType>
</xs:element>
</xs:schema>
```

b.

```
<?xml version="1.0" encoding="UTF-8"?>
- <BioskopskiRepertoar xmlns:xsi="http://www.w3.org/2009/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="D:\NASTAVA\pbp\pbpXMLbaze\bioskop.xsd">
  - <Film FilmId="1">
    <NazivFilma>Gangster Squad</NazivFilma>
    <ImeRezisera>Ruben Fleisher</ImeRezisera>
  </Film>
  - <Film FilmId="2">
    <NazivFilma>Mama</NazivFilma>
    <ImeRezisera>Andres Muschietti</ImeRezisera>
    <Trajanje>110</Trajanje>
  </Film>
  - <Bioskop>
    <NazivBioskopa>Tuckwood</NazivBioskopa>
    <Lokacija>Beograd</Lokacija>
    - <Sala>
      <NazivSale>Marilyn Monroe</NazivSale>
      - <Projekcija FilmId="1">
        <DatumProjekcije>"2013-12-01"</DatumProjekcije>
        <BrojPosetilaca>53</BrojPosetilaca>
      </Projekcija>
      - <Projekcija FilmId="2">
        <DatumProjekcije>"2013-12-05"</DatumProjekcije>
        <BrojPosetilaca>33</BrojPosetilaca>
      </Projekcija>
    </Sala>
  </Bioskop>
  - <Film FilmId="3">
    <NazivFilma>A Good Day to Die Hard</NazivFilma>
    <ImeRezisera>John Moore</ImeRezisera>
  </Film>
</BioskopskiRepertoar>
```

c. //Sala[NazivSale="Marilyn Monroe"]/Projekcija[count()]