Exam – SEMI-STRUCTURED DATA_CORROIGE TYPE

23rd May, 2022

01:00 Hour

Exercise 01 (8pts)

Convert the following DTD into an XML schema.

قم بتحويل الـ DTD التالي إلى XML schema.

```
<!ELEMENT Car (Brand, power, Color)>
 <!ELEMENT Brand (Pegeot | Renault | BMW | Hyundai)>
 <!ELEMENT power (07 | 08 | 09 | 10 | 11)>
 <!ELEMENT Color (Red | Green | Blue) "Blue">
 <!ATTLIST Car Matricule CDATA #REQUIRED; >
```

Exercise 02 (12pts)

We would like to describe the students of El Oued University (an arbitrary number of students), using an XML document. Each student is identified by its registration number (**RegistrationNumber**) and should be specified with the following data:

- **FirstName**: text value (required).
- **FamilyName**: text value (required).
- **Age**: an integer value between 1 and 150 (required).
- **Address**: described below (not mandatory)
- **Level**: one of the following values: 1L, 2L, 3L, 1M, 2M (required)
- **speciality**: one of the following values: ComputerScience, Physics, Chemistry, Mathematics (required).
- **Average**: a Real value between 0.00 and 20.00, its default value is 0.00 (required).

An **address** is composed of four sub elements:

- **Number**: an integer value.
- **City**: text value.
- **PostalCode**: five digits from the list {0,1,2,3,4,5,6,7,8,9}.

The registration numbers of students must be presented as attributes in the XML documents.

- **Give the XML schema of El Oued University student documents.**

Exo01

```
<?xml version="1.0" encoding="Windows-1252"?>
<xs:schema xmlns="http://tempuri.org/TP20"
           elementFormDefault="qualified"
```

```
         targetNamespace="http://tempuri.org/TP20"
         xmlns:xs="http://www.w3.org/2001/XMLSchema">
<xs:element name="Car">
  <xs:complexType>
    <xs:sequence>

      <xs:element name="Brand">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="Peugeot"/>
          <xs:enumeration value="Renault"/>
          <xs:enumeration value="BMW"/>
          <xs:enumeration value="Hyundai"/>
        </xs:restriction>
      </xs:simpleType>
      </xs:element>


      <xs:element name="power">
      <xs:simpleType>
        <xs:restriction base="xs:integer">
          <xs:minInclusive value="07"/>
          <xs:maxInclusive value="11"/>
        </xs:restriction>
      </xs:simpleType>
      </xs:element>

        <xs:element name="Color">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:enumeration value="Red"/>
            <xs:enumeration value="Green"/>
            <xs:enumeration value="Blue"/>
            <xs:enumeration value="Hyundai"/>
          </xs:restriction>
        </xs:simpleType>
        </xs:element>

     </xs:sequence>

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

   </xs:complexType>
  </xs:element>

</xs:schema>
```

Exo02:

```
<?xml version="1.0" encoding="UTF-8" ?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
        <xs:element name="students">
                <xs:complexType>
                        <xs:sequence>
                                <xs:element name="student"
                                        maxOccurs="unbounded">
                                        <xs:complexType>
                                                <xs:attribute name="RegistrationNumber"
                                                        type="xs:string"
                                                        use="required"/>
                                                <xs:sequence>
                                                        <xs:element name="Firstname"
                                                                type="xs:string"/>
                                                        <xs:element name="Familyname"
                                                                type="xs:string"/>
                                                        <xs:element name="Age">
                                                                <xs:simpleType>
                                                                        <xs:restriction base="xs:integer">
                                                                                <xs:minInclusive value="01"/>
                                                                                <xs:maxInclusive value="150"/>
                                                                        </xs:restriction>
                                                                </xs:simpleType>
                                                        </xs:element>
                                                        <xs:element name="Adress"
                                                                minOccurs="0">
                                                                <xs:complexType>
                                                                        <xs:sequence>
                                                                                <xs:element name="Number"
                                                                                        type="xs:positiveIneger"/>
                                                                                <xs:element name="City"
                                                                                        type="xs:string"/>
                                                                                <xs:element name="Postalcode">
                                                                                        <xs:simpleType>
                                                                                                <xs:restriction base="xs:string">
                                                                                                        <xs:pattern value="[0-9]{5}"/>
                                                                                                </xs:restriction>
                                                                                        </xs:simpleType>
                                                                                </xs:element>
                                                                        </xs:sequence>
                                                                </xs:complexType>
                                                        </xs:element>
                                                        <xs:element name="Level">
```

```
                <xs:simpleType>
                    <xs:restriction base="xs:string">
                        <xs:enumeration value="1L"/>
                        <xs:enumeration value="2L"/>
                        <xs:enumeration value="3L"/>
                        <xs:enumeration value="1M"/>
                        <xs:enumeration value="2M"/>
                    </xs:restriction>
                </xs:simpleType>
            </xs:element>
            <xs:element name="Spetiality">
                <xs:simpleType>
                    <xs:restriction base="xs:string">
                        <xs:enumeration value="Computer_Science"/>
                        <xs:enumeration value="physics"/>
                        <xs:enumeration value="Chemistry"/>
                        <xs:enumeration value="Mathematics"/>
                    </xs:restriction>
                </xs:simpleType>
            </xs:element>
            <xs:element name="Average"
                 default="0.00">
                <xs:simpleType>
                    <xs:restriction base="xs:decimal">
                        <xs:minInclusive value="0.00"/>
                        <xs:maxInclusive value="20.00"/>
                    </xs:restriction>
                </xs:simpleType>
            </xs:element>
        </xs:sequence>
    </xs:complexType>
</xs:element>
</xs:schema>
```