

Indian Institute of Technology, Madras
Chennai



CS6852 : Assignment 1 - Ontology Design

Group - 13

Domain - Hospital management
DTD and XML DATA

Submitted To :

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Problem Statement

Pick a domain of their choice and model the information in the domain using a DTD. Also, populate with data on an appropriate platform. Write a brief description of the design of the DTD.

XML DTD

```
<!DOCTYPE hospital
[<!ELEMENT hospital (staff*)>
<!ELEMENT staff (doctor | nurse | receptionist | security )*>
<!ELEMENT doctor (name, gender, specialization,phoneNumber, education,schedule,
designation?, department?, patient*)>
<!ELEMENT nurse (name, gender, qualification, designation?, department?, patient*)>
<!ELEMENT receptionist (name, gender, designation?, department?)>
<!ELEMENT security (name, gender, designation?, department?)>
<!ELEMENT name (#PCDATA)>
<!ELEMENT gender (#PCDATA)>
<!ELEMENT specialization (#PCDATA)>
<!ELEMENT education (#PCDATA)>
<!ELEMENT qualification (#PCDATA)>
<!ELEMENT designation (#PCDATA)>
<!ELEMENT department (#PCDATA)>
<!ELEMENT phoneNumber (#PCDATA)>
<!ELEMENT schedule (Day*)>
<!ELEMENT Day (StartTime, EndTime)>
<!ELEMENT StartTime (#PCDATA)>
<!ELEMENT EndTime (#PCDATA)>
<!ELEMENT patient (name, gender, age, diagnosis, admission_date,Address,
discharge_date?, billing)>
<!ELEMENT age (#PCDATA)>
<!ELEMENT diagnosis (#PCDATA)>
<!ELEMENT admission_date (#PCDATA)>
<!ELEMENT discharge_date (#PCDATA)>
<!ELEMENT billing (bill+)>
<!ELEMENT bill (item+, total_amount)>
<!ELEMENT item (name, quantity, unit_price, total_price)>
<!ELEMENT quantity (#PCDATA)>
```

```
<!ELEMENT unit_price (#PCDATA)>
<!ELEMENT total_price (#PCDATA)>
<!ELEMENT total_amount (#PCDATA)>
<!ATTLIST patient id CDATA #REQUIRED>
<!ATTLIST patient status (admitted | discharged) #REQUIRED>
<!ATTLIST bill id CDATA #REQUIRED>
<!ATTLIST bill date CDATA #REQUIRED>
<!ATTLIST item id CDATA #REQUIRED>
<!ELEMENT Address ( Street, City, State, ZIP)>
<!ELEMENT Street (#PCDATA)>
<!ELEMENT City (#PCDATA)>
<!ELEMENT State (#PCDATA)>
<!ELEMENT ZIP (#PCDATA)>
]>
```

XML DATA :

```
<hospital>
  <staff>
    <nurse>
      <name>Watson</name>
      <gender>Female</gender>
      <qualification>Bachelor of Science in Nursing</qualification>
      <designation>Head Nurse</designation>
      <department>Emergency Room</department>
      <patient id= P001 status= admitted >
        <name>Smith</name>
        <gender>Male</gender>
        <age>45</age>
        <diagnosis>Broken Arm</diagnosis>
        <admission_date>2023-02-28</admission_date>

      <Address>
        <Street>Brodipet</Street>
        <City>Guntur</City>
        <State>AP</State>
        <ZIP>12345</ZIP>
```

</Address>

<billing >

<bill id= B001 date= 2023-02-28 >

<item id= I001 >

<name>Hospital Room</name>

<quantity>1</quantity>

<unit_price>250</unit_price>

<total_price>250</total_price>

</item>

<item id= I002 >

<name>Medication</name>

<quantity>10</quantity>

<unit_price>15</unit_price>

<total_price>150</total_price>

</item>

<total_amount>400</total_amount>

</bill>

</billing>

</patient>

</nurse>

</staff>

<staff>

<doctor>

<name>Johnson</name>

<gender>Male</gender>

<specialization>Anesthesiology</specialization>

<phoneNumber>+91 1234567890</phoneNumber>

<education>Doctor of Medicine</education>

<schedule>

<Day>

<StartTime>08:00</StartTime>

<EndTime>12:00</EndTime>

</Day>

<Day>

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<EndTime>17:00</EndTime>
</Day>
</schedule>
<designation>anesthesia</designation>
<department>Anesthesiology</department>
<patient id= P002 status= discharged >
  <name>Alice Johnson</name>
  <gender>Female</gender>
  <age>60</age>
  <diagnosis>peripheral arterial disease</diagnosis>
  <admission_date>2023-01-28</admission_date>
  <Address>
    <Street>Kothapet</Street>
    <City>Guntur</City>
    <State>AP</State>
    <ZIP>12345</ZIP>
  </Address>
  <billing >
    <bill id= B002 date= 2022-02-23 >
      <item id= I003 >
        <name>Hospital Room</name>
        <quantity>10</quantity>
        <unit_price>200</unit_price>
        <total_price>2000</total_price>
      </item>
      <item id= I004 >
        <name>Angiogram</name>
        <quantity>1</quantity>
        <unit_price>1500</unit_price>
        <total_price>1500</total_price>
      </item>
      <total_amount>3500</total_amount>
    </bill>
  </billing>
</patient>
</doctor>
</staff>
```

```
<staff>
  <doctor >
    <name>Sumail</name>
    <gender>Male</gender>
    <specialization>Dermatology</specialization>
    <phoneNumber>1234567890</phoneNumber>
    <education>MBBS, MD</education>
    <schedule>
      <Day>
        <StartTime>10:00 AM</StartTime>
        <EndTime>4:00 PM</EndTime>
      </Day>
      <Day>
        <StartTime>6:00 PM</StartTime>
        <EndTime>9:00 PM</EndTime>
      </Day>
    </schedule>
    <department>Dermatology</department>
    <patient id= P003  status= admitted >
      <name>Notail</name>
      <gender>Male</gender>
      <age>55</age>
      <diagnosis>Heart Attack</diagnosis>
      <admission_date>2022-02-25</admission_date>
      <Address>
        <Street>Nehru Nagar</Street>
        <City>Guntur</City>
        <State>AP</State>
        <ZIP>12345</ZIP>
      </Address>
      <billing>
        <bill id= B003  date= 2022-03-01 >
          <item id= T005 >
            <name>Room Charges</name>
            <quantity>5</quantity>
            <unit_price>200</unit_price>
            <total_price>1000</total_price>
          </item>
          <item id= T006 >
```

```
<name>Medicine</name>
<quantity>10</quantity>
<unit_price>50</unit_price>
<total_price>500</total_price>
</item>
<total_amount>1500</total_amount>
</bill>
</billing>
</patient>
</doctor>
<nurse>
<name>Topson</name>
<gender>Female</gender>
<qualification>BSc Nursing</qualification>
<department>Dermatology</department>
<patient id= P005 status= admitted >
  <name>David Wilson</name>
  <gender>Male</gender>
  <age>40</age>
  <diagnosis>Coronary Artery Disease</diagnosis>
  <admission_date>2022-02-28</admission_date>
  <Address>
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    <City>Guntur</City>
    <State>AP</State>
    <ZIP>12345</ZIP>
  </Address>
  <billing>
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      <item id= I007 >
        <name>Room Charges</name>
        <quantity>3</quantity>
        <unit_price>200</unit_price>
        <total_price>600</total_price>
      </item>
      <item id= I008 >
        <name>Medicine</name>
        <quantity>5</quantity>
        <unit_price>50</unit_price>
```

```
        <total_price>250</total_price>
    </item>
    <total_amount>850</total_amount>
</bill>
</billing>
</patient>
</nurse>
</staff>

<staff>
    <doctor >
        <name>Jerax</name>
        <gender>female</gender>
        <specialization>Neurology</specialization>
        <phoneNumber>1234567890</phoneNumber>
        <education>MBBS, MD</education>
        <schedule>
            <Day>
                <StartTime>9:00am</StartTime>
                <EndTime>5:00pm</EndTime>
            </Day>
            <Day>
                <StartTime>10:00am</StartTime>
                <EndTime>6:00pm</EndTime>
            </Day>
            <Day>
                <StartTime>12:00pm</StartTime>
                <EndTime>8:00pm</EndTime>
            </Day>
        </schedule>
        <designation>Senior Consultant</designation>
        <department>Neurology</department>
        <patient id= P006  status= discharged >
            <name>Ana</name>
            <gender>male</gender>
            <age>55</age>
            <diagnosis>Myocardial infarction</diagnosis>
            <admission_date>2022-10-10</admission_date>
            <Address>
```


<Street>Navabharat Nagar</Street>
<City>Guntur</City>
<State>AP</State>
<ZIP>12345</ZIP>
</Address>

<discharge_date>2022-10-20</discharge_date>
<billing>
 <bill id= B008 date= 2022-10-25 >
 <item id= I031 >
 <name>Medication</name>
 <quantity>30</quantity>
 <unit_price>5.00</unit_price>
 <total_price>150.00</total_price>
 </item>
 <item id= I032 >
 <name>Tests</name>
 <quantity>2</quantity>
 <unit_price>200.00</unit_price>
 <total_price>400.00</total_price>
 </item>
 <total_amount>550.00</total_amount>
 </bill>
</billing>
</patient>
</doctor>
</staff>

<staff>
 <doctor>
 <name>Fly</name>
 <gender>Male</gender>
 <specialization>Hematology</specialization>
 <phoneNumber>1234567890</phoneNumber>
 <education>MD, PhD</education>
 <schedule>
 <Day>
 <StartTime>9:00AM</StartTime>
 <EndTime>5:00PM</EndTime>

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</Day>
<Day>
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  <EndTime>1:00PM</EndTime>
</Day>
</schedule>
<department>Hematology</department>
<patient id= P030 status= admitted >
  <name>Marci</name>
  <gender>Female</gender>
  <age>55</age>
  <diagnosis>Cardiovascular Disease</diagnosis>
  <admission_date>2023-02-28</admission_date>
  <Address>
    <Street>Navabharat Nagar</Street>
    <City>Chennai</City>
    <State>Tamil Nadu</State>
    <ZIP>12345</ZIP>
  </Address>
  <billing>
    <bill id= B018 date= 2023-03-01 >
      <item id= I039 >
        <name>Room Charge</name>
        <quantity>3</quantity>
        <unit_price>500</unit_price>
        <total_price>1500</total_price>
      </item>
      <item id= I040 >
        <name>Medication</name>
        <quantity>1</quantity>
        <unit_price>100</unit_price>
        <total_price>100</total_price>
      </item>
      <total_amount>1600</total_amount>
    </bill>
  </billing>
</patient>
</doctor>
</staff>
```

```
<staff>
  <doctor>
    <name>John Smith</name>
    <gender>Male</gender>
    <specialization>Cardiology</specialization>
    <phoneNumber>555-1234</phoneNumber>
    <education>MD</education>
    <schedule>
      <Day>
        <StartTime>9:00 AM</StartTime>
        <EndTime>4:00 PM</EndTime>
      </Day>
      <Day>
        <StartTime>10:00 AM</StartTime>
        <EndTime>5:00 PM</EndTime>
      </Day>
    </schedule>
    <designation>Consultant</designation>
    <department>Cardiology</department>
    <patient id= P033 status= admitted >
      <name>Hari</name>
      <gender>Female</gender>
      <age>45</age>
      <diagnosis>Intestines infarction</diagnosis>
      <admission_date>2022-02-15</admission_date>
      <Address>
        <Street>Lakshmi Puram </Street>
        <City>Hyderabad</City>
        <State>Telangana</State>
        <ZIP>600028</ZIP>
      </Address>
      <billing >
        <bill id= B020 date= 2022-02-28 >
          <item id= I050 >
            <name>Room charge</name>
            <quantity>3</quantity>
            <unit_price>150</unit_price>
            <total_price>450</total_price>
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```
</item>
<item id= I045 >
  <name>Medication</name>
  <quantity>5</quantity>
  <unit_price>50</unit_price>
  <total_price>250</total_price>
</item>
<total_amount>700</total_amount>
</bill>
</billing>
</patient>
</doctor>
</staff>

<staff>
  <doctor>
    <name>Saravanan</name>
    <gender>Male</gender>
    <specialization>Endocrinology</specialization>
    <phoneNumber>+91 9876543210</phoneNumber>
    <education>MBBS, MD</education>
    <schedule>
      <Day>
        <StartTime>09:00 AM</StartTime>
        <EndTime>02:00 PM</EndTime>
      </Day>
      <Day>
        <StartTime>03:00 PM</StartTime>
        <EndTime>06:00 PM</EndTime>
      </Day>
    </schedule>
    <department>Endocrinologists</department>
    <patient id= P037  status= admitted >
      <name>Vidya</name>
      <gender>Female</gender>
      <age>45</age>
      <diagnosis>Liver infarction</diagnosis>
      <admission_date>2023-02-25</admission_date>
      <Address>
```

```
<Street>Lakshmi Puram </Street>
<City>Chennai</City>
<State>Tamil Nadu</State>
<ZIP>600028</ZIP>
</Address>
<billing >
  <bill id= B025  date= 2023-03-01 >
    <item id= I057 >
      <name>Angiogram</name>
      <quantity>1</quantity>
      <unit_price>15000</unit_price>
      <total_price>15000</total_price>
    </item>
    <item id= I053 >
      <name>Cardiac MRI</name>
      <quantity>1</quantity>
      <unit_price>25000</unit_price>
      <total_price>25000</total_price>
    </item>
    <total_amount>40000</total_amount>
  </bill>
</billing>
</patient>
</doctor>
</staff>

<staff>
  <nurse>
    <name>Emily</name>
    <gender>Female</gender>
    <qualification>Registered Nurse</qualification>
    <department>ICU</department>
    <patient id= P070  status= discharged >
      <name>Bob</name>
      <gender>Male</gender>
      <age>60</age>
      <diagnosis>Pneumonia</diagnosis>
      <admission_date>2022-01-01</admission_date>
      <Address>
```

```
<Street>Navabharat Nagar</Street>
<City>Chennai</City>
<State>Tamil Nadu</State>
<ZIP>12345</ZIP>
</Address>
<discharge_date>2022-01-15</discharge_date>
<billing >
  <bill id= B028  date= 2022-01-16 >
    <item id= I059 >
      <name>Room charge</name>
      <quantity>15</quantity>
      <unit_price>200</unit_price>
      <total_price>3000</total_price>
    </item>
    <item id= I060 >
      <name>Medication</name>
      <quantity>10</quantity>
      <unit_price>100</unit_price>
      <total_price>1000</total_price>
    </item>
    <total_amount>4000</total_amount>
  </bill>
</billing>
</patient>
</nurse>
</staff>
```

```
<staff>
<nurse>
  <name>Lakshmi</name>
  <gender>Female</gender>
  <qualification>B.Sc Nursing</qualification>
  <designation>Head Nurse</designation>
  <department>ICU</department>
  <patient id= P089  status= discharged >
    <name>Ramesh</name>
    <gender>Male</gender>
    <age>56</age>
    <diagnosis>Heart Attack</diagnosis>
```

```
<admission_date>2023-03-03</admission_date>
<Address>
  <Street>Indira Nagar</Street>
  <City>Bangalore</City>
  <State>Karnataka</State>
  <ZIP>560038</ZIP>
</Address>
<billing >
  <bill id= B030  date= 2022-01-16 >
    <item id= I067 >
      <name>Medicine</name>
      <quantity>1</quantity>
      <unit_price>500</unit_price>
      <total_price>500</total_price>
    </item>
    <total_amount>500</total_amount>
  </bill>
</billing>
</patient>
</nurse>
</staff>
```

```
<staff>
  <doctor>
    <name>Arjun</name>
    <gender>Male</gender>
    <specialization>Cardiology</specialization>
    <phoneNumber>9876543210</phoneNumber>
    <education>MBBS, MD</education>
    <schedule>
      <Day>
        <StartTime>10:00</StartTime>
        <EndTime>12:00</EndTime>
      </Day>
      <Day>
        <StartTime>16:00</StartTime>
        <EndTime>18:00</EndTime>
      </Day>
    </schedule>
```

```
<department>Cardiology</department>
<patient id= P090  status= discharged >
  <name>Sujatha</name>
  <gender>Female</gender>
  <age>43</age>
  <diagnosis>Spinal Cord Disease</diagnosis>
  <admission_date>2023-02-28</admission_date>
  <Address>
    <Street>Gandhi Nagar</Street>
    <City>Chennai</City>
    <State>Tamil Nadu</State>
    <ZIP>600020</ZIP>
  </Address>
  <billing >
    <bill id= B034  date= 2022-01-16 >
      <item id= I078 >
        <name>Angioplasty</name>
        <quantity>1</quantity>
        <unit_price>30000</unit_price>
        <total_price>30000</total_price>
      </item>
      <total_amount>30000</total_amount>
    </bill>
  </billing>
</patient>
</doctor>
</staff>
```

```
<staff>
  <doctor>
    <name>Rajesh kangaroo</name>
    <gender>Male</gender>
    <specialization>Neurology</specialization>
    <phoneNumber>9876543210</phoneNumber>
    <education>MBBS, DM</education>
    <schedule>
      <Day>
        <StartTime>10:00</StartTime>
        <EndTime>13:00</EndTime>
```



```
</Day>
<Day>
  <StartTime>15:00</StartTime>
  <EndTime>18:00</EndTime>
</Day>
</schedule>
<department>Neurology</department>
<patient id= P301  status= admitted >
  <name>Kavya</name>
  <gender>Female</gender>
  <age>23</age>
  <diagnosis>Migraine</diagnosis>
  <admission_date>2023-03-01</admission_date>
  <Address>
    <Street>789 Pine Street</Street>
    <City>Bangalore</City>
    <State>Karnataka</State>
    <ZIP>560001</ZIP>
  </Address>
  <billing>
    <bill id= B301  date= 2023-03-02 >
      <item id= I301 >
        <name>Medication</name>
        <quantity>3</quantity>
        <unit_price>600</unit_price>
        <total_price>1800</total_price>
      </item>
      <item id= I305 >
        <name>Tests</name>
        <quantity>2</quantity>
        <unit_price>2000</unit_price>
        <total_price>4000</total_price>
      </item>
      <total_amount>5800</total_amount>
    </bill>
  </billing>
</patient>
</doctor>
<nurse>
```

```
<name>Divya</name>
<gender>Female</gender>
<qualification>BSc Nursing</qualification>
<department>Neurology</department>
<patient id= P302  status= discharged >
  <name>Ram</name>
  <gender>Male</gender>
  <age>55</age>
  <diagnosis>Stroke</diagnosis>
  <admission_date>2022-12-15</admission_date>
  <Address>
    <Street>345 Oak Street</Street>
    <City>Chennai</City>
    <State>Tamil Nadu</State>
    <ZIP>600001</ZIP>
  </Address>
  <discharge_date>2022-12-23</discharge_date>
  <billing>
    <bill id= B302  date= 2022-12-23 >
      <item id= I006 >
        <name>Room Charges</name>
        <quantity>8</quantity>
        <unit_price>750</unit_price>
        <total_price>6000</total_price>
      </item>
      <total_amount>6000</total_amount>
    </bill>
  </billing>
</patient>
</nurse>
</staff>
```

```
<staff>
  <doctor>
    <name>Shreya</name>
    <gender>Female</gender>
    <specialization>Oncology</specialization>
    <phoneNumber>8463926543</phoneNumber>
    <education>MBBS, MD</education>
```

```
<schedule>
  <Day>
    <StartTime>09:00</StartTime>
    <EndTime>12:00</EndTime>
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  <Day>
    <StartTime>14:00</StartTime>
    <EndTime>17:00</EndTime>
  </Day>
</schedule>
<department>Oncology</department>
<patient id= P303 status= admitted >
  <name>Ankit Reddy</name>
  <gender>Male</gender>
  <age>42</age>
  <diagnosis>Adrenal Cancer</diagnosis>
  <admission_date>2023-02-28</admission_date>
  <Address>
    <Street>123 Main Street</Street>
    <City>Mumbai</City>
    <State>Maharashtra</State>
    <ZIP>400001</ZIP>
  </Address>
  <billing>
    <bill id= B302 date= 2023-03-03 >
      <item id= I307 >
        <name>Medication</name>
        <quantity>4</quantity>
        <unit_price>700</unit_price>
        <total_price>2800</total_price>
      </item>
      <item id= I308 >
        <name>Tests</name>
        <quantity>3</quantity>
        <unit_price>2500</unit_price>
        <total_price>7500</total_price>
      </item>
      <total_amount>10300</total_amount>
    </bill>
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```
</billing>
</patient>
</doctor>
<nurse>
  <name>Manish Pandey</name>
  <gender>Male</gender>
  <qualification>BSc Nursing</qualification>
  <department>Oncology</department>
  <patient id= P304  status= discharged >
    <name>Neha</name>
    <gender>Female</gender>
    <age>31</age>
    <diagnosis>Chest Pain</diagnosis>
    <admission_date>2022-11-05</admission_date>
    <Address>
      <Street>456 Park Avenue</Street>
      <City>Delhi</City>
      <State>Delhi</State>
      <ZIP>110001</ZIP>
    </Address>
    <discharge_date>2022-11-08</discharge_date>
  <billing>
    <bill id= B304  date= 2022-11-08 >
      <item id= I309 >
        <name>Room Charges</name>
        <quantity>3</quantity>
        <unit_price>800</unit_price>
        <total_price>2400</total_price>
      </item>
      <item id= I310 >
        <name>Consultation Fees</name>
        <quantity>1</quantity>
        <unit_price>1200</unit_price>
        <total_price>1200</total_price>
      </item>
      <total_amount>3600</total_amount>
    </bill>
  </billing>
</patient>
```

</nurse>
</staff>

<staff>
 <doctor>
 <name>Akash</name>
 <gender>Male</gender>
 <specialization>Neurology</specialization>
 <phoneNumber>8452174602</phoneNumber>
 <education>MBBS, MD, DM</education>
 <schedule>
 <Day>
 <StartTime>08:00</StartTime>
 <EndTime>13:00</EndTime>
 </Day>
 <Day>
 <StartTime>15:00</StartTime>
 <EndTime>18:00</EndTime>
 </Day>
 </schedule>
 <department>Neurology</department>
 <patient id= P305 status= admitted >
 <name>Karishma</name>
 <gender>Female</gender>
 <age>28</age>
 <diagnosis>Epilepsy</diagnosis>
 <admission_date>2023-03-01</admission_date>
 <Address>
 <Street>789 North Avenue</Street>
 <City>Bangalore</City>
 <State>Karnataka</State>
 <ZIP>560001</ZIP>
 </Address>
 <billing>
 <bill id= B307 date= 2023-03-03 >
 <item id= I311 >
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  <age>32</age>
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    <gender>Female</gender>
    <age>27</age>
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    <gender>Male</gender>
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    <department>Cardiology</department><patient id= P101  status= admitted >
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      <age>50</age>
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  <qualification>B.Sc Nursing</qualification>
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  <patient id= P141  status= admitted >
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    <age>35</age>
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  <gender>Female</gender>
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  <designation>security Officer</designation>
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  <gender>Female</gender>
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  <designation>Registered Nurse</designation>
  <department>Cardiology</department>
  <patient id= P102  status= admitted >
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    <gender>Female</gender>
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        <department>Pediatrics</department>
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  <gender>Female</gender>
  <qualification>Bachelor of Science in Nursing</qualification>
  <department>Pediatrics</department>
  <patient id= P154  status= admitted >
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    <gender>Female</gender>
    <age>4</age>
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  <gender>Male</gender>
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  <name>Sara Patel</name>
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<designation>Head Nurse</designation>
<department>Emergency Department</department>
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  <designation>security Guard</designation>
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  <patient id= P134 status= admitted >
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    <gender>Female</gender>
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  <admission_date>2023-02-28</admission_date>
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  <gender>Male</gender>
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  <patient id= P216 status= discharged >
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    <gender>Female</gender>
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  <gender>Male</gender>
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  <name>Arpita Dasgupta</name>
  <gender>Female</gender>
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  <diagnosis>Coronary Artery Disease</diagnosis>
  <admission_date>2022-02-18</admission_date>
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  <name>Indrani Das</name>
  <gender>Female</gender>
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<patient id= P220 status= discharged >
  <name>Rajesh Roy</name>
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  <gender>Male</gender>
  <age>19</age>
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  <gender>Female</gender>
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    <phoneNumber>1234567890</phoneNumber>
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    <age>35</age>
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  <patient id= P204 status= discharged >
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    <gender>Male</gender>
    <age>45</age>
    <diagnosis>Migraine</diagnosis>
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  <gender>Male</gender>
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    <gender>Female</gender>
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  <name>Anupama</name>
  <gender>Female</gender>
  <qualification>BSc Nursing</qualification>
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  <patient id= P402 status= discharged >
    <name>Ravi Teja</name>
    <gender>Male</gender>
    <age>45</age>
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  <gender>Female</gender>
  <designation>Front desk executive</designation>
  <department>Administration</department>
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<security>
  <name>Ram Charan</name>
  <gender>Male</gender>
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    <gender>Male</gender>
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  <gender>Male</gender>
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    <City>Bangalore</City>
    <State>Karnataka</State>
    <ZIP>560001</ZIP>
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  <name>Geetha</name>
  <gender>Female</gender>
  <qualification>B.Sc Nursing</qualification>
  <department>ICU</department>
  <patient id= P404 status= admitted >
    <name>Rama Devi</name>
    <gender>Female</gender>
    <age>30</age>
    <diagnosis>Acute Respiratory Distress Syndrome</diagnosis>
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  <name>Raju</name>
  <gender>Male</gender>
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    <patient id= P405 status= admitted >
      <name>Ravi</name>
      <gender>Male</gender>
      <age>45</age>
      <diagnosis>Malaria</diagnosis>
      <admission_date>2022-08-15</admission_date>
      <Address>
        <Street>NTR Road</Street>
        <City>Visakhapatnam</City>
        <State>Andhra Pradesh</State>
        <ZIP>530001</ZIP>
      </Address>
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    <item id= I461 >
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      <total_price>1000.00</total_price>
    </item>
    <item id= I462 >
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    </item>
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</doctor>
<nurse>
  <name>Manjula</name>
  <gender>Female</gender>
  <qualification>B.Sc Nursing</qualification>
  <department>Cardiology</department>
  <patient id= P406  status= discharged >
    <name>Lakshmi</name>
    <gender>Female</gender>
    <age>60</age>
    <diagnosis>Heart Failure</diagnosis>
    <admission_date>2022-08-18</admission_date>
    <Address>
      <Street>Near Mirchi Yard</Street>
      <City>Guntur</City>
      <State>Andhra Pradesh</State>
      <ZIP>522001</ZIP>
    </Address>
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</item>
<item id= I465 >
  <name>Consultation Fees</name>
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  <unit_price>500.00</unit_price>
  <total_price>500.00</total_price>
</item>
<total_amount>14500.00</total_amount>
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</nurse>
<receptionist>
  <name>Nikitha</name>
  <gender>Female</gender>
  <department>Front Desk</department>
</receptionist>
<security>
  <name>Somu</name>
  <gender>Male</gender>
  <department>security</department>
</security>
</staff>

<staff>
  <doctor>
    <name>Ramana Reddy</name>
    <gender>Male</gender>
    <specialization>Neurology</specialization>
    <phoneNumber>7904781235</phoneNumber>
    <education>MD</education>
    <schedule>
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</Day>
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</Day>
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<patient id= P407 status= admitted >
  <name>Saradha</name>
  <gender>Female</gender>
  <age>45</age>
  <diagnosis>Paralysis</diagnosis>
  <admission_date>2022-02-01</admission_date>
  <Address>
    <Street>ITI street</Street>
    <City>Kadapa</City>
    <State>Andhra Pradesh</State>
    <ZIP>516002</ZIP>
  </Address>
  <billing>
    <bill id= B465 date= 2022-02-10 >
      <item id= I466 >
        <name>Medicine</name>
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      <total_amount>500</total_amount>
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  </billing>
</patient>
</doctor>
<nurse>
  <name>Radha</name>
  <gender>Female</gender>
  <qualification>Registered Nurse</qualification>
  <designation>Nurse Practitioner</designation>
  <department>Cardiology</department>
```

```
<patient id= P408  status= discharged >
  <name>Hari Krishna</name>
  <gender>Male</gender>
  <age>60</age>
  <diagnosis>Heart attack</diagnosis>
  <admission_date>2022-02-15</admission_date>
  <Address>
    <Street>Near Old Busstand</Street>
    <City>Kadapa</City>
    <State>Andhra Pradesh</State>
    <ZIP>516003</ZIP>
  </Address>
  <discharge_date>2022-03-01</discharge_date>
  <billing>
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      <item id= I469 >
        <name>Consultation</name>
        <quantity>1</quantity>
        <unit_price>100</unit_price>
        <total_price>100</total_price>
      </item>
      <item id= I470 >
        <name>Tests</name>
        <quantity>3</quantity>
        <unit_price>50</unit_price>
        <total_price>150</total_price>
      </item>
      <total_amount>250</total_amount>
    </bill>
  </billing>
</patient>
</nurse>
<receptionist>
  <name>Arjun Kumar</name>
  <gender>Male</gender>
  <department>Front Desk</department>
</receptionist>
<security>
  <name>Deepa Nair</name>
```

<gender>Female</gender>
<department>security</department>
</security>
</staff>

<staff>
<doctor>
<name>Sridhar Reddy</name>
<gender>Male</gender>
<specialization>Dermatology</specialization>
<phoneNumber>9876543210</phoneNumber>
<education>MBBS, MD</education>
<schedule>
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<Day>
<StartTime>03:00 PM</StartTime>
<EndTime>06:00 PM</EndTime>
</Day>
</schedule>
<department>Dermatology</department>
<patient id= P409 status= admitted >
<name>Rajesh</name>
<gender>Male</gender>
<age>45</age>
<diagnosis>Psoriasis</diagnosis>
<admission_date>2022-02-28</admission_date>
<Address>
<Street>Main Road</Street>
<City>Chittoor</City>
<State>Andhra Pradesh</State>
<ZIP>517001</ZIP>
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<billing>
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<name>ECG</name>

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<total_price>500</total_price>
</item>
<item id= I474 >
  <name>Blood Test</name>
  <quantity>1</quantity>
  <unit_price>1000</unit_price>
  <total_price>1000</total_price>
</item>
<total_amount>1500</total_amount>
</bill>
</billing>
</patient>
</doctor>
<nurse>
  <name>Leela</name>
  <gender>Female</gender>
  <qualification>ANM</qualification>
  <department>Dermatology</department>
  <patient id= P410 status= admitted >
    <name>Anjali</name>
    <gender>Female</gender>
    <age>30</age>
    <diagnosis>Eczema</diagnosis>
    <admission_date>2022-03-01</admission_date>
    <Address>
      <Street>Gandhi Road</Street>
      <City>Chittoor</City>
      <State>Andhra Pradesh</State>
      <ZIP>517001</ZIP>
    </Address>
  </patient>
  <billing>
    <bill id= B475 date= 2022-03-01 >
      <item id= I476 >
        <name>Medicine</name>
        <quantity>5</quantity>
        <unit_price>100</unit_price>
        <total_price>500</total_price>
```



```
        </item>
        <total_amount>500</total_amount>
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</billing>
</patient>
</nurse>
<receptionist>
    <name>Pradeep</name>
    <gender>Male</gender>
    <department>Reception</department>
</receptionist>
<security>
    <name>Harish</name>
    <gender>Male</gender>
    <department>security</department>
</security>
</staff>

<staff>
    <doctor>
        <name>Aditya</name>
        <gender>Male</gender>
        <specialization>Cardiology</specialization>
        <phoneNumber>9876543210</phoneNumber>
        <education>MBBS, MD</education>
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            </Day>
            <Day>
                <StartTime>2:00 PM</StartTime>
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            </Day>
        </schedule>
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        <patient id= P411 status= admitted >
            <name>Shiva Kumar</name>
            <gender>Male</gender>
```

<age>45</age>
<diagnosis>Coronary artery disease</diagnosis>
<admission_date>2023-02-20</admission_date>
<Address>
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 <City>Vizag</City>
 <State>Andhra Pradesh</State>
 <ZIP>530001</ZIP>
</Address>
<billing>
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 </item>
 <item id= I477 >
 <name>Medicines</name>
 <quantity>1</quantity>
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</billing>
</patient>
</doctor>
<nurse>
 <name>Radha</name>
 <gender>Female</gender>
 <qualification>B.Sc Nursing</qualification>
 <department>Cardiology</department>
 <patient id= P412 status= discharged >
 <name>Krishna Reddy</name>
 <gender>Male</gender>
 <age>60</age>
 <diagnosis>Heart attack</diagnosis>
 <admission_date>2023-02-22</admission_date>

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<Address>
  <Street>Seethampeta</Street>
  <City>Vizag</City>
  <State>Andhra Pradesh</State>
  <ZIP>530016</ZIP>
</Address>
<discharge_date>2023-02-27</discharge_date>
<billing>
  <bill id= B478 date= 2023-02-27 >
    <item id= 1479 >
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      <quantity>5</quantity>
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    </item>
    <total_amount>10000</total_amount>
  </bill>
</billing>
</patient>
</nurse>
<receptionist>
  <name>Prasad</name>
  <gender>Male</gender>
  <designation>Front desk executive</designation>
  <department>Administration</department>
</receptionist>
<security>
  <name>Harish</name>
  <gender>Male</gender>
  <department>security</department>
</security>
</staff>

<staff>
  <doctor>
    <name>Dr. Priya Sharma</name>
    <gender>Female</gender>
    <specialization>Pediatrics</specialization>
    <phoneNumber>9876543210</phoneNumber>
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<education>MBBS, MD (Pediatrics)</education>
<schedule>
 <Day>
 <StartTime>9:00 AM</StartTime>
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 <Day>
 <StartTime>2:00 PM</StartTime>
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</schedule>
<department>Pediatrics</department>
<patient id= P419 status= admitted >
 <name>Shreya Singh</name>
 <gender>Female</gender>
 <age>50</age>
 <diagnosis>Asthma</diagnosis>
 <admission_date>2022-02-15</admission_date>
 <Address>
 <Street>Poolangallu</Street>
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 <State>Andhra Pradesh</State>
 <ZIP>516390</ZIP>
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 <billing >
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 <quantity>5</quantity>
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 <item id= I490 >
 <name>Medicines</name>
 <quantity>3</quantity>
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</bill>
</billing>
</patient>
</doctor>
<nurse>
  <name>Akshara Reddy</name>
  <gender>Female</gender>
  <qualification>B.Sc Nursing</qualification>
  <department>Pediatrics</department>
  <patient id= P420  status= admitted >
    <name>Aryan Gupta</name>
    <gender>Male</gender>
    <age>6</age>
    <diagnosis>Fever</diagnosis>
    <admission_date>2022-02-20</admission_date>
    <Address>
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      <City>Pulivendula</City>
      <State>Andhra Pradesh</State>
      <ZIP>516390</ZIP>
    </Address>
  <billing >
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      </item>
      <item id= I487 >
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        <quantity>2</quantity>
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  </billing>
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```
</nurse>
<receptionist>
  <name>Nikitha</name>
  <gender>Female</gender>
  <department>Administration</department>
</receptionist>
<security>
  <name>Sarath</name>
  <gender>Male</gender>
  <department>security</department>
</security>
</staff>
```

```
<staff>
  <doctor>
    <name>Dr. Anjali Sharma</name>
    <gender>Female</gender>
    <specialization>Anesthesiology</specialization>
    <phoneNumber>9876543210</phoneNumber>
    <education>MBBS, MD (Anesthesiology)</education>
    <schedule>
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        <StartTime>9:00 AM</StartTime>
        <EndTime>1:00 PM</EndTime>
      </Day>
      <Day>
        <StartTime>2:00 PM</StartTime>
        <EndTime>6:00 PM</EndTime>
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    <department>Anesthesiology</department>
    <patient id= P421 status= admitted >
      <name>Rahul Verma</name>
      <gender>Male</gender>
      <age>32</age>
      <diagnosis>Fractured leg</diagnosis>
      <admission_date>2022-12-05</admission_date>
      <Address>
        <Street>Balaji Colony</Street>
```

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<City>Tirupati</City>
<State>Andhra Pradesh</State>
<ZIP>517501</ZIP>
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    <item id= I492 >
      <name>Room Charges</name>
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      <total_price>10000</total_price>
    </item>
    <item id= I493 >
      <name>Doctor Consultation</name>
      <quantity>2</quantity>
      <unit_price>500</unit_price>
      <total_price>1000</total_price>
    </item>
    <total_amount>11000</total_amount>
  </bill>
</billing>
</patient>
</doctor>
<nurse>
  <name>Sneha Patil</name>
  <gender>Female</gender>
  <qualification>Bachelor of Science in Nursing</qualification>
  <department>Anesthesiology</department>
  <patient id= P422  status= discharged >
    <name>Shweta Singh</name>
    <gender>Female</gender>
    <age>25</age>
    <diagnosis>Appendix Removal</diagnosis>
    <admission_date>2022-11-20</admission_date>
  <Address>
    <Street>Bavani Nagar</Street>
    <City>Tirupati</City>
    <State>Andhra Pradesh</State>
    <ZIP>517501</ZIP>
```

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</Address>
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<billing >
  <bill id= B494  date= 2022-11-30 >
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      <total_price>8000</total_price>
    </item>
    <item id= I496 >
      <name>Nursing Care</name>
      <quantity>5</quantity>
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      <total_price>2500</total_price>
    </item>
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</billing>
</patient>
</nurse>
<receptionist>
  <name>Shalini</name>
  <gender>Female</gender>
  <designation>Receptionist</designation>
  <department>Administration</department>
</receptionist>
<security>
  <name>Ramesh</name>
  <gender>Male</gender>
  <designation>security Guard</designation>
  <department>security</department>
</security>
</staff>

<staff>
  <doctor>
    <name>Dr.Malla Reddy</name>
    <gender>Male</gender>
```


<specialization>Urologist</specialization>
<phoneNumber>9876543210</phoneNumber>
<education>MBBS, MS, MCh</education>
<schedule>
 <Day>
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 <EndTime>1:00 PM</EndTime>
 </Day>
 <Day>
 <StartTime>2:00 PM</StartTime>
 <EndTime>6:00 PM</EndTime>
 </Day>
</schedule>
<department>Urology</department>
<patient id= P423 status= admitted >
 <name>Amritha Nair</name>
 <gender>Female</gender>
 <age>45</age>
 <diagnosis>Kidney stones</diagnosis>
 <admission_date>2022-02-15</admission_date>
 <Address>
 <Street>Gachibowli</Street>
 <City>Hyderabad</City>
 <State>Telangana</State>
 <ZIP>500002</ZIP>
 </Address>
<billing >
 <bill id= B492 date= 2022-02-15 >
 <item id= I497 >
 <name>Consultation</name>
 <quantity>1</quantity>
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 <total_price>1000</total_price>
 </item>
 <item id= I498 >
 <name>X-ray</name>
 <quantity>2</quantity>
 <unit_price>500</unit_price>
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</item>
  <total_amount>2000</total_amount>
</bill>
</billing>
</patient>
</doctor>
<nurse>
  <name>Keerty Suresh</name>
  <gender>Female</gender>
  <qualification>BSc Nursing</qualification>
  <designation>Head Nurse</designation>
  <department>Urology</department>
  <patient id= P424 status= admitted >
    <name>Rajeshwari</name>
    <gender>Female</gender>
    <age>45</age>
    <diagnosis>Kidney stones</diagnosis>
    <admission_date>2022-02-15</admission_date>
    <Address>
      <Street>Madhapur</Street>
      <City>Hyderabad</City>
      <State>Telangana</State>
      <ZIP>500002</ZIP>
    </Address>
  <billing>
    <bill id= B493 date= 2022-02-15 >
      <item id= I491 >
        <name>Room Charges</name>
        <quantity>1</quantity>
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        <total_price>1000</total_price>
      </item>
      <item id= I499 >
        <name>X-ray</name>
        <quantity>2</quantity>
        <unit_price>500</unit_price>
        <total_price>1000</total_price>
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    <total_amount>2000</total_amount>
```

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    </bill>
  </billing>
</patient>
</nurse>
<receptionist>
  <name>Ramesh</name>
  <gender>Male</gender>
  <designation>Receptionist</designation>
  <department>Administration</department>
</receptionist>
<security>
  <name>Samantha</name>
  <gender>Female</gender>
  <designation>security Guard</designation>
  <department>security</department>
</security>
</staff>
</hospital>
```

Hospital

The DTD defines the structure and rules for an XML document that could be used to represent data related to a hospital system. The document contains information about staff members such as doctors, nurses, receptionists, and security personnel and about patients and billing.

The DTD starts with declaring the root element hospital, which can contain zero or more staff elements. The staff element can contain zero or more doctors, nurses, receptionists, or security elements.

The doctor element must contain a name, gender, specialization, phoneNumber , education, and schedule element and can optionally contain a designation and department element. It can also contain zero or more patient elements.

The nurse element must contain a name, gender, and qualification element, and can optionally contain a designation and department element. It can also contain zero or more patient elements.

The receptionist and security elements must contain a name, gender , and can optionally contain a designation and department element.

The name, gender, specialization, education, qualification, designation, department, phoneNumber, StartTime, EndTime, age, diagnosis, admission_date, and discharge_date, quantity, unit_price, total_price, total_amount, Street, City, State, and ZIP elements are defined as #PCDATA elements, meaning they can contain any text data.

The schedule element must contain one or more Day elements, including a StartTime and EndTime element.

The patient element must contain a name, gender, age, diagnosis, admission_date, Address, and billing element, and must have an id attribute and a status attribute. The discharge_date element is optional.

The billing element must contain one or more bill elements.

The bill element must contain one or more item elements and a total_amount element, with an id attribute and a date attribute.

The item element must contain a name, quantity, unit_price, and total_price element, and must have an id attribute.

Overall, this DTD provides a framework for organizing and structuring data related to a hospital system in an XML document format that can be easily processed and analyzed by software applications.

STRUCTURE

hospital

```
|— staff
|  |— nurse
|  |  |— name: Watson
|  |  |— gender: Female
|  |  |— qualification: Bachelor of Science in Nursing
|  |  |— designation: Head Nurse
|  |  |— department: Emergency Room
|  |  |— patient id="P001" status="admitted"
|  |  |  |— name: Smith
|  |  |  |— gender: Male
|  |  |  |— age: 45
|  |  |  |— diagnosis: Broken Arm
|  |  |  |— admission_date: 2023-02-28
|  |  |  |— Address
|  |  |  |  |— Street: Brodipet
|  |  |  |  |— City: Guntur
|  |  |  |  |— State: AP
|  |  |  |  |— ZIP: 12345
|  |  |— billing
|  |  |  |— bill id="B001" date="2023-02-28"
|  |  |  |— item id="I001"
|  |  |  |  |— name: Hospital Room
|  |  |  |  |— quantity: 1
|  |  |  |  |— unit_price: 250
|  |  |  |  |— total_price: 250
|  |  |  |— item id="I002"
|  |  |  |  |— name: Medication
```

- quantity: 10
 - unit_price: 15
 - total_price: 150
- total_amount: 400
- staff
- doctor
- name: Johnson
- gender: Male
- specialization: Anesthesiology
- phoneNumber: +91 1234567890
- education: Doctor of Medicine
- schedule
- Day
 - StartTime: 08:00
 - EndTime: 12:00
- Day
 - StartTime: 13:00
 - EndTime: 17:00
- designation: anesthesia
- department: Anesthesiology
- patient id="P002" status="discharged"
- name: Alice Johnson
- gender: Female
- age: 60
- diagnosis: peripheral arterial disease
- admission_date: 2023-01-28
- Address
- Street: Kothapet
 - City: Guntur
 - State: AP
 - ZIP: 12345
- billing
- bill id="B002" date="2022-02-23"
- item id="I003"
- name: Hospital Room
 - quantity: 10
 - unit_price: 200
 - total_price: 2000
- item id="I004"

```
| |— name: Angiogram
| |— quantity: 1
| |— unit_price: 1500
| |— total_price: 1500
|— total_amount: 3500
```