Ryerson University

Department of Electrical, Computer, & Biomedical Engineering
Faculty of Engineering & Architectural Science

Course Title:	Fundamentals of Data Engineering
Course Number:	COE 848
Semester/Year (e.g.F2016)	W2024

Instructor:	Dr. Faezeh Ensan

Assignment/Lab Number:	Lab 6
Assignment/Lab Title:	Semi-Structured Data in XML/XSLT

Submission Date:	April 4, 2024
Due Date:	April 4, 2024

Student LAST Name	Student FIRST Name	Student Number	Section	Signature*
Saini	Harsanjam	501055402	04	Harsanjam

5 Query Result using XSLT and XML

Query 1: Retrieve the names of players who are under 30 years old
SELECT PlayerID, Name, Age, BirthDate
FROM Players
WHERE Age < 30;

XSLT Code:

```
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform">

 <!-- Copy everything from the input XML that is not matched by any template -->
 <xsl:template match="@*|node()">
  <xsl:copy>
   <xsl:apply-templates select="@*|node()"/>
  </xsl:copy>
 </xsl:template>

 <!-- Match the root element and transform the result -->
 <xsl:template match="/">
  <html>
   <head>
    <style>
     table {
      font-family: Arial, sans-serif;
      border-collapse: collapse;
      width: 100%;
     }
     th, td {
      border: 1px solid #dddddd;
      text-align: left;
      padding: 8px;
     }
     th {
      background-color: #f2f2f2;
     }
    </style>
   </head>
   <body>
    <h2>Players Under 30 Years Old</h2>
    <table>
     <tr>
       <th>Player ID</th>
      <th>Name</th>
       <th>Age</th>
       <th>BirthDate</th>
```

```
        </tr>
        <!-- Apply templates to the result -->
        <xsl:apply-templates select="//row"/>
      </table>
    </body>
  </html>
</xsl:template>

<!-- Match the row element and display the player's name -->
<xsl:template match="row">
  <xsl:if test="Age &lt; 30">
    <tr>
      <td><xsl:value-of select="PlayerID"/></td>
      <td><xsl:value-of select="Name"/></td>
      <td><xsl:value-of select="Age"/></td>
      <td><xsl:value-of select="BirthDate"/></td>

    </tr>
  </xsl:if>
</xsl:template>
</xsl:stylesheet>
```

Output Result:

Players Under 30 Years Old

Player ID	Name	Age	BirthDate
5	Giannis Antetokounmpo	27	1994-12-06
7	Anthony Davis	29	1993-03-11
8	Luka Doncic	23	1999-02-28
10	Devin Booker	25	1996-10-30
11	Joel Embiid	28	1993-03-16
13	Donovan Mitchell	26	1996-09-07
15	Karl-Anthony Towns	27	1995-11-15
16	Devin Vassell	22	2000-08-23
17	Tyrese Haliburton	22	2000-02-29
18	Jalen Suggs	20	2001-06-03
19	Dejounte Murray	25	1996-09-19
20	Cole Anthony	21	2000-05-15
21	Cade Cunningham	20	2001-09-25

Query 2: List of Teams founded before 1970
SELECT TeamID, TeamName, Founded, Sponsor, Record
FROM Teams
WHERE Founded < 1970
ORDER BY Founded ASC;

XSLT Code:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform">

 <!-- Copy everything from the input XML that is not matched by any template -->
 <xsl:template match="@*|node()">
  <xsl:copy>
   <xsl:apply-templates select="@*|node()"/>
  </xsl:copy>
 </xsl:template>

 <!-- Match the root element and transform the result -->
 <xsl:template match="/">
  <html>
   <head>
    <style>
     table {
       font-family: Arial, sans-serif;
       border-collapse: collapse;
       width: 100%;
     }
     th, td {
       border: 1px solid #dddddd;
       text-align: left;
       padding: 8px;
     }
     th {
       background-color: #f2f2f2;
     }
    </style>
   </head>
   <body>
    <h2>Teams Founded Before 1970</h2>
    <table>
     <tr>
      <th>TeamID</th>
      <th>TeamName</th>
      <th>Founded</th>
```

```
        <th>Sponsor</th>
        <th>Record</th>
      </tr>
      <!-- Apply templates to the result -->
      <xsl:apply-templates select="//row[Founded &lt; 1970]">
        <xsl:sort select="Founded" data-type="number" order="ascending"/>
      </xsl:apply-templates>
    </table>
   </body>
  </html>
 </xsl:template>

 <!-- Match the row element and display the team's information -->
 <xsl:template match="row">
    <tr>
      <td><xsl:value-of select="TeamID"/></td>
      <td><xsl:value-of select="TeamName"/></td>
      <td><xsl:value-of select="Founded"/></td>
      <td><xsl:value-of select="Sponsor"/></td>
      <td><xsl:value-of select="Record"/></td>
    </tr>
 </xsl:template>
</xsl:stylesheet>
```

Output Result:

Teams Founded Before 1970

TeamID	TeamName	Founded	Sponsor	Record
13	Detroit Pistons	1941	Rocket Mortgage	10-19
2	Golden State Warriors	1946	Under Armour	22-3
6	Philadelphia 76ers	1946	StubHub	24-11
1	Los Angeles Lakers	1947	Nike	20-15
14	Washington Wizards	1961	Capital One	11-18
10	Chicago Bulls	1966	United Airlines	19-16
3	Brooklyn Nets	1967	Adidas	18-17
11	San Antonio Spurs	1967	Frost Bank	15-20
4	Milwaukee Bucks	1968	Puma	23-12
5	Phoenix Suns	1968	State Farm	21-14

Query 3: Retrieve the list of teams that won more than 20 matches

```
SELECT TeamID, TeamName, Wins, Losses, Draws, Sponsor
FROM Teams
WHERE Wins > 20;
```

XSLT Code:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform">

 <!-- Copy everything from the input XML that is not matched by any template -->
 <xsl:template match="@*|node()">
  <xsl:copy>
   <xsl:apply-templates select="@*|node()"/>
  </xsl:copy>
 </xsl:template>

 <!-- Match the root element and transform the result -->
 <xsl:template match="/">
  <html>
   <head>
    <style>
     table {
       font-family: Arial, sans-serif;
       border-collapse: collapse;
       width: 100%;
     }
     th, td {
       border: 1px solid #dddddd;
       text-align: left;
       padding: 8px;
     }
     th {
       background-color: #f2f2f2;
     }
    </style>
   </head>
   <body>
    <h2>Teams with More Than 20 Wins</h2>
    <table>
     <tr>
       <th>TeamID</th>
       <th>Team Name</th>
       <th>Wins</th>
          <th>Losses</th>
```

```
                    <th>Draws(Tie)</th>
    <th>Sponsor</th>
        </tr>
        <!-- Apply templates to the result -->
        <xsl:apply-templates select="//row"/>
      </table>
    </body>
  </html>
</xsl:template>

<!-- Match the row element and display team names with more than 20 wins -->
<xsl:template match="row">
  <xsl:if test="Wins &gt; 20">
    <tr>
      <td><xsl:value-of select="TeamID"/></td>
      <td><xsl:value-of select="TeamName"/></td>
      <td><xsl:value-of select="Wins"/></td>
      <td><xsl:value-of select="Losses"/></td>
      <td><xsl:value-of select="Draws"/></td>
      <td><xsl:value-of select="Sponsor"/></td>

    </tr>
  </xsl:if>
</xsl:template>

</xsl:stylesheet>
```

Output Result:

Teams with More Than 20 Wins

TeamID	Team Name	Wins	Losses	Draws(Tie)	Sponsor
2	Golden State Warriors	22	3	0	Under Armour
4	Milwaukee Bucks	23	12	0	Puma
5	Phoenix Suns	21	14	0	State Farm
6	Philadelphia 76ers	24	11	0	StubHub
7	Utah Jazz	25	10	0	Qualtrics

Query 4: List of players position = "Point Guard" and their Statistics

SELECT PlayerID, Name, Position, FieldGoalPercentage, FreeThrowPercentage, ThreePointPercentage,
NumberOfPenalties, PointsPerGame, AssistsPerGame, ReboundsPerGame
FROM Players
WHERE Position = 'Point Guard';

XSLT Code:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
 <!-- Copy everything from the input XML that is not matched by any template -->
 <xsl:template match="@*|node()">
  <xsl:copy>
   <xsl:apply-templates select="@*|node()"/>
  </xsl:copy>
 </xsl:template>
 <!-- Match the root element and transform the result -->
 <xsl:template match="/">
  <html>
   <head>
    <style>
     table {
       font-family: Arial, sans-serif;
       border-collapse: collapse;
       width: 100%;
     }
     th, td {
       border: 1px solid #dddddd;
       text-align: left;
       padding: 8px;
     }
     th {
       background-color: #f2f2f2;
     }
    </style>
   </head>
   <body>
    <h2>List of Players' Positions - Point Guard</h2>
    <table>
     <tr>
      <th>Player ID</th>
      <th>Name</th>
      <th>Position</th>
      <th>Field Goal Percentage</th>
      <th>Free Throw Percentage</th>
      <th>Three Point Percentage</th>
      <th>Number of Penalties</th>
      <th>Points Per Game</th>
```

```
            <th>Assists Per Game</th>
            <th> Rebounds Per Game</th>
          </tr>
          <!-- Apply templates to the result -->
          <xsl:apply-templates select="//row[Position = 'Point Guard']"/>
        </table>
      </body>
    </html>
  </xsl:template>
  <!-- Match the row element with the specified position -->
  <xsl:template match="row[Position = 'Point Guard']">
    <tr>
      <td><xsl:value-of select="PlayerID"/></td>
      <td><xsl:value-of select="Name"/></td>
      <td><xsl:value-of select="Position"/></td>
      <td><xsl:value-of select="FieldGoalPercentage"/></td>
      <td><xsl:value-of select="FreeThrowPercentage"/></td>
      <td><xsl:value-of select="ThreePointPercentage"/></td>
      <td><xsl:value-of select="NumberOfPenalties"/></td>
      <td><xsl:value-of select="PointsPerGame"/></td>
      <td><xsl:value-of select="AssistsPerGame"/></td>
      <td><xsl:value-of select="ReboundsPerGame"/></td>
    </tr>
  </xsl:template>
</xsl:stylesheet>
```

Output Result:

List of Players' Positions - Point Guard

Player ID	Name	Position	Field Goal Percentage	Free Throw Percentage	Three Point Percentage	Number of Penalties	Points Per Game	Assists Per Game	Rebounds Per Game
2	Stephen Curry	Point Guard	48.2	92.1	42.5	3	32.6	9.8	5.2
8	Luka Doncic	Point Guard	48.9	83.2	36.5	3	33.1	10.4	8.9
9	Damian Lillard	Point Guard	45.6	90.1	39.8	3	29.5	7.8	4.3
12	Chris Paul	Point Guard	46.2	88.7	37.5	1	26.7	9.3	5.1
17	Tyrese Haliburton	Point Guard	41.2	85.3	32.6	1	12.9	6.5	3.8
18	Jalen Suggs	Point Guard	45.9	81.6	37.4	2	18.3	5.8	4.2
19	Dejounte Murray	Point Guard	42.6	83.1	33.8	1	17.2	6.3	4.9
20	Cole Anthony	Point Guard	39.8	79.4	30.5	2	14.8	5.9	3.4
21	Cade Cunningham	Point Guard	44.3	87.2	35.6	2	19.5	6.8	5.2

Query 5: List of Players with the Most Points Per Game
SELECT PlayerID, Name, PointsPerGame, Position, Age, Awards
FROM Players
ORDER BY PointsPerGame DESC;

XSLT Code:

```
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform">

 <!-- Copy everything from the input XML that is not matched by any template -->
 <xsl:template match="@*|node()">
  <xsl:copy>
   <xsl:apply-templates select="@*|node()"/>
  </xsl:copy>
 </xsl:template>

 <!-- Match the root element and transform the result -->
 <xsl:template match="/">
  <html>
   <head>
    <style>
     table {
       font-family: Arial, sans-serif;
       border-collapse: collapse;
       width: 100%;
     }
     th, td {
       border: 1px solid #dddddd;
       text-align: left;
       padding: 8px;
     }
     th {
       background-color: #f2f2f2;
     }
    </style>
   </head>
   <body>
    <h2>List of Players with the Most Points Per Game (Highest to Lowest)</h2>
    <table>
     <tr>
```

```
        <th>PlayerID</th>
        <th>Name</th>
        <th>Points Per Game</th>
        <th>Position</th>
        <th>Age</th>
        <th>Awards</th>
      </tr>
      <!-- Apply templates to select players with the most PointsPerGame -->
      <xsl:apply-templates select="//row">
        <xsl:sort select="PointsPerGame" data-type="number" order="descending"/>
      </xsl:apply-templates>
    </table>
   </body>
  </html>
 </xsl:template>

 <!-- Match the row elements and display player name and PointsPerGame -->
 <xsl:template match="row">
  <tr>
    <td><xsl:value-of select="PlayerID"/></td>
    <td><xsl:value-of select="Name"/></td>
    <td><xsl:value-of select="PointsPerGame"/></td>
    <td><xsl:value-of select="Position"/></td>
    <td><xsl:value-of select="Age"/></td>
    <td><xsl:value-of select="Awards"/></td>

  </tr>
 </xsl:template>

</xsl:stylesheet>
```

Output Result:

List of Players with the Most Points Per Game (Highest to Lowest)

PlayerID	Name	Points Per Game	Position	Age	Awards
8	Luka Doncic	33.1	Point Guard	23	15
2	Stephen Curry	32.6	Point Guard	33	20
5	Giannis Antetokounmpo	31.5	Power Forward	27	22
11	Joel Embiid	30.9	Center	28	20
3	Kevin Durant	30.2	Power Forward	33	18
6	James Harden	29.7	Shooting Guard	33	18
15	Karl-Anthony Towns	29.6	Center	27	17
9	Damian Lillard	29.5	Point Guard	32	16
1	LeBron James	28.5	Small Forward	36	15
10	Devin Booker	28.4	Shooting Guard	25	17
13	Donovan Mitchell	27.8	Shooting Guard	26	16
7	Anthony Davis	27.3	Power Forward	29	18
4	Kawhi Leonard	26.8	Small Forward	30	20
12	Chris Paul	26.7	Point Guard	38	18
14	Jimmy Butler	25.3	Small Forward	32	20
21	Cade Cunningham	19.5	Point Guard	20	13
18	Jalen Suggs	18.3	Point Guard	20	12
19	Dejounte Murray	17.2	Point Guard	25	12
16	Devin Vassell	15.7	Small Forward	22	10
20	Cole Anthony	14.8	Point Guard	21	9
17	Tyrese Haliburton	12.9	Point Guard	22	8