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Department of Computer Technology

Vision of the Department

To be a well-known centre for pursuing computer education through innovative pedagogy, value-based education and industry collaboration.

Mission of the Department

To establish learning ambience for ushering in computer engineering professionals in core and multidisciplinary area by developing Problem-solving skills through emerging technologies.

Session 2025-2026

Vision: Dream of where you want.	**Mission:** Means to achieve Vision

Program Educational Objectives of the program (PEO): (broad statements that describe the professional and career accomplishments)

PEO1	**Preparation**	**P: Preparation**	**Pep-CL abbreviation pronounce as Pep-si-lL easy to recall**
PEO2	**Core Competence**	**E: Environment (Learning Environment)**	
PEO3	**Breadth**	**P: Professionalism**	
PEO4	**Professionalism**	**C: Core Competence**	
PEO5	**Learning Environment**	**L: Breadth (Learning in diverse areas)**	

Program Outcomes (PO): (statements that describe what a student should be able to do and know by the end of a program)

Keywords of POs:

Engineering knowledge, Problem analysis, Design/development of solutions, Conduct Investigations of Complex Problems, Engineering Tool Usage, The Engineer and The World, Ethics, Individual and Collaborative Team work, Communication, Project Management and Finance, Life-Long Learning

PSO Keywords: Cutting edge technologies, Research

"I am an engineer, and I know how to apply engineering knowledge to investigate, analyse and design solutions to complex problems using tools for entire world following all ethics in a collaborative way with proper management skills throughout my life." *to contribute to the development of cutting-edge technologies and Research*.

Integrity: I will adhere to the Laboratory Code of Conduct and ethics in its entirety.

Name and Signature of Student and Date

(Signature and Date in Handwritten)

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Session	2024-25 (ODD)	Course Name	Web Technology Lab
Semester	3	Course Code	23CT1301
Roll No	67	Name of Student	*Rushikesh Prashant Bhondekar*

Practical Number	Practical No: 05
Course Outcome	1. Understand various internet technologies. 2. Design the web pages using HTML and CSS. 3. Implement the XML technology to store the data. 4. Develop the interactive web pages using JavaScript.
Aim	[A] Introduction to XML. Program to demonstrate the use of External and Internal DTD.(Write an XML file which will display the employee information which includes the following: 1) Employee ID 2) Name of Employee 3) Department of Employee 4) Designation of Employee 5) Email of Employee 6) Salary of Employee [B] Create XML for student information and access second student's data using DOM.

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Problem Definition	**[A] Introduction to XML with External and Internal DTD:** This program demonstrates how XML can be validated using DTD (Document Type Definition). An XML file is created to store employee information, including ID, name, department, designation, email, and salary. Internal DTD is written inside the XML file itself, while external DTD is defined in a separate .dtd file and linked using <!DOCTYPE> declaration. The program ensures that the XML structure follows the defined rules, maintaining data consistency and correctness. It helps in understanding how DTD enforces the structure and constraints of XML documents.

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	[B] XML for Student Information Using DOM: This program creates an XML file to store multiple students' details such as ID, name, class, and marks. Using JavaScript and the DOM parser, it reads the XML data and extracts the information of the second student. The program demonstrates how DOM methods like getElementsByTagName() and textContent can be used to access and manipulate XML elements dynamically in a web page. It provides a practical example of retrieving structured data from XML for display or processing in HTML applications.

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Theory (100 words)	**[A] Introduction to XML with External and Internal DTD:** XML (eXtensible Markup Language) is a flexible language used to store and transport structured data. DTD (Document Type Definition) is used to define the structure and rules of an XML document, ensuring data consistency. Internal DTD is written directly inside the XML file, while external DTD is saved separately and linked using the <!DOCTYPE> declaration. By using DTD, we can define required elements, their order, and data types. In this program, employee information such as ID, name, department, designation, email, and salary is stored in XML and validated against the DTD. This ensures that the XML document follows a correct and predictable structure. **[B] XML for Student Information Using DOM:** DOM (Document Object Model) allows programs to access and manipulate XML documents as a tree structure. Using DOM methods like getElementsByTagName(), specific elements can be retrieved dynamically. In this example, student information is stored in XML, and the second student's data is accessed using JavaScript. This demonstrates how XML and DOM can be used together to efficiently handle structured data in web applications.

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Procedure and Execution (100 Words)	**[A] Employee Information with Internal and External DTD:**
	1. **Define DTD:** First, create rules for employee elements (ID, name, department, designation, email, salary). Internal DTD is written inside the XML file; external DTD is saved in a separate .dtd file.
	2. **Create XML File:** Write the XML document containing employee data. Link external DTD using <!DOCTYPE> if required.
	3. **Validate XML:** Ensure the XML conforms to the DTD rules. The parser checks element order, presence, and structure.
	4. **Execution:** Open the XML in a parser or editor. Validation confirms correctness, ensuring structured and consistent data.
	[B] Student Information Using DOM:
	1. **Create XML File:** Store student data with multiple elements.
	2. **Load XML in HTML:** Use JavaScript DOM methods like DOMParser() to parse XML.
	3. **Access Data:** Use getElementsByTagName() and textContent to retrieve the second student's details.
	4. **Display Output:** Dynamically show the information on the web page.

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Code:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/css" href="employee.css"?>
<!DOCTYPE employees [
  <!ELEMENT employees (employee+)>
  <!ELEMENT employee (id, name, department, designation, email, salary)>
  <!ELEMENT id (#PCDATA)>
  <!ELEMENT name (#PCDATA)>
  <!ELEMENT department (#PCDATA)>
  <!ELEMENT designation (#PCDATA)>
  <!ELEMENT email (#PCDATA)>
  <!ELEMENT salary (#PCDATA)>
]>
<employees>
  <employee>
    <h1>EMPLOYEE 1 INFORMATION</h1>
    <id>101</id>
    <name>Rahul Sharma</name>
    <department>IT</department>
    <designation>Software Engineer</designation>
    <email>rahul.sharma@example.com</email>
    <salary>55000</salary>
  </employee>
```

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```xml
      <employee>
         <h1>EMPLOYEE 2 INFORMATION</h1>
         <id>102</id>
         <name>Neha Verma</name>
         <department>HR</department>
         <designation>HR Manager</designation>
         <email>neha.verma@example.com</email>
         <salary>60000</salary>
      </employee>
</employees>

<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/css" href="employee.css"?>
<!DOCTYPE employees SYSTEM "employee.dtd">
<employees>
   <employee>
      <h1>EMPLOYEE 3 INFORMATION</h1>
      <id>103</id>
      <name>Amit Kumar</name>
      <department>Finance</department>
      <designation>Accountant</designation>
      <email>amit.kumar@example.com</email>
      <salary>45000</salary>
   </employee>
   <employee>
      <h1>EMPLOYEE 4 INFORMATION</h1>
      <id>104</id>
      <name>Pooja Singh</name>
      <department>Marketing</department>
      <designation>Marketing Head</designation>
      <email>pooja.singh@example.com</email>
      <salary>70000</salary>
   </employee>
</employees>

<!ELEMENT employees (employee+)>
<!ELEMENT employee (id, name, department, designation, email, salary)>
<!ELEMENT id (#PCDATA)>
<!ELEMENT name (#PCDATA)>
<!ELEMENT department (#PCDATA)>
```

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	<!ELEMENT designation (#PCDATA)> <!ELEMENT email (#PCDATA)> <!ELEMENT salary (#PCDATA)>

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```css
/* Page base */ employees {   display:
block;   font-family: system-ui, Arial,
sans-serif;   margin: 15px;   line-height:
1.35;   background-color: deeppink;
  text-align: center;
}

/* Employee card */ employee {   display:
block;   border: 1px solid #1900ff;
padding: 16px;   margin: 12px 0;
border-radius: 10px;   box-shadow: 0 1px
4px rgba(0, 0, 0, 0.06);   background-color:
chartreuse;
}

/* Make fields block-level with spacing
*/ employee > * {   display: block;
margin: 6px 0;   text-align: left;
  text-decoration: dotted;
}

/* Headline (name) bigger */
name {
  font-size: 1.1rem;
font-weight: 600;   color:
blue;
}

/* Light label + bold value using generated content */
id::before          { content: "ID: ";          color: #666; font-weight: 500; }
department::before { content: "Department: ";  color: #666; font-weight: 500;
} designation::before{ content: "Designation: "; color: #666; font-weight: 500;
} email::before      { content: "Email: ";      color: #666; font-weight: 500; }
salary::before     { content: "Salary: ₹";     color: #666; font-weight: 500; }
```

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```css
/* Optional: emphasize salary value */
salary {   font-weight: 600;
}

/* Section title using generated content */
employees::before {
content: "Employees";
  display: block;
font-size: 1.4rem;
font-weight: 700;
margin-bottom: 12px;
} h1{    color:rgb(254,
0, 76);
} body{    background-color: rgb(5,
255, 238);
   color: rgb(255, 0, 136);
padding : 20px;    margin:
20px;    text-align:center;
} button{
color:darkred;
   background-color: gold;
}
```

B.

```html
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <title>EMPLOYEE INFORMATION</title>
   <link rel="stylesheet" href="employee.css">
</head>
<body>
   <h1>EMPLOYEE INFORMATION</h1>
        <button onclick="getSecondEmployee()">Get Second Employee's Info</button>

   <h2>Second Employee's Data:</h2>
   <div id="second-employee-info"></div>
```

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```
<script>

    // Function to load XML file using fetch
function loadXML()
    {
       return fetch('employee_internal.xml')
         .then(response => response.text())
         .then(str => {
            const parser = new DOMParser();              return
parser.parseFromString(str, "application/xml");
         });
    }

    // Function to get the second employee's data
function getSecondEmployee()
    {
       loadXML().then(xmlDoc =>
        {
          // Get all employee elements
          const employees = xmlDoc.getElementsByTagName("employee");

            // Check if there are at least two employees            if
(employees.length >= 2) {                    const secondEmployee =
employees[1]; // Index 1 is the second employee

            // Extracting details of the second employee
                                                const id       =
secondEmployee.getElementsByTagName("id")[0].textContent;
                                                const name     =
secondEmployee.getElementsByTagName("name")[0].textContent;
                                                const department =
secondEmployee.getElementsByTagName("department")[0].textContent;
                                                const designation =
secondEmployee.getElementsByTagName("designation")[0].textContent;
                                                const email    =
```

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```
secondEmployee.getElementsByTagName("email")[0].textContent;
                                    const    salary    =
secondEmployee.getElementsByTagName("salary")[0].textContent;

        // Display the second employee's information
        document.getElementById("second-employee-info").innerHTML
= `
```

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```
                    <p><strong>ID:</strong> ${id}</p>
                    <p><strong>Name:</strong> ${name}</p>
                    <p><strong>Department:</strong> ${department}</p>
                    <p><strong>Designation:</strong> ${designation}</p>
                    <p><strong>Email:</strong> ${email}</p>
                    <p><strong>Salary:</strong> ${salary}</p>
                `;
            } else {
                alert("There are less than 2 employees in the data.");
            }
        }).catch(err => {
            console.error("Error loading XML file:", err);
        });
    }
  </script>
</body>
</html>
```

Output:

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Employees

EMPLOYEE 1 INFORMATION
ID: 101
Rahul Sharma
Department: IT
Designation: Software Engineer
Email: rahul.sharma@example.com
Salary: ₹55000

EMPLOYEE 2 INFORMATION
ID: 102
Neha Verma
Department: HR
Designation: HR Manager
Email: neha.verma@example.com
Salary: ₹60000

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	Employees EMPLOYEE 3 INFORMATION ID: 103 **Amit Kumar** Department: Finance Designation: Accountant Email: amit.kumar@example.com Salary: ₹45000 EMPLOYEE 4 INFORMATION ID: 104 **Pooja Singh** Department: Marketing Designation: Marketing Head Email: pooja.singh@example.com Salary: ₹70000 **EMPLOYEE INFORMATION** Get Second Employee's Info **Second Employee's Data:** **ID:** 102 **Name:** Neha Verma **Department:** HR **Designation:** HR Manager **Email:** neha.verma@example.com **Salary:** 60000
Output Analysis	**[A] Employee Information with Internal and External DTD:** ● The XML file displays structured employee information. ● Validation using DTD ensures all required elements (ID, name, department, designation, email, salary) are present and follow the correct order. ● If the XML violates the DTD rules, the parser throws errors, preventing invalid data storage.

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	● On successful execution, the output shows the employee data in a well-organized format, confirming that the XML structure is correct and consistent.

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	[B] Student Information Using DOM: ● The HTML page dynamically retrieves and displays the second student's information from the XML file. ● DOM methods like getElementsByTagName() successfully locate elements, and textContent extracts their values. ● The output appears on the web page as readable text (or table if formatted), showing the correct details of the second student. ● This demonstrates that DOM parsing allows easy access to structured XML data for practical applications.
Link of student Github profile where lab assignment has been uploaded	*https://github.com/rushikesh-bhondekar?tab=repositories*

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Conclusion	The exercises demonstrate the practical use of XML for storing and managing structured data. Using **Internal and External DTD**, we ensured that the employee information follows a defined structure, validating the correctness and consistency of data. This highlights the importance of DTD in enforcing rules and preventing errors in XML documents. The second exercise, accessing student information using **DOM**, shows how XML data can be dynamically read and displayed in web applications. By using DOM methods, specific elements like the second student's details can be extracted and presented efficiently. Overall, these programs illustrate that XML, combined with DTD and DOM, provides a robust framework for data storage, validation, and retrieval, making it highly suitable for applications that require structured and organized information.

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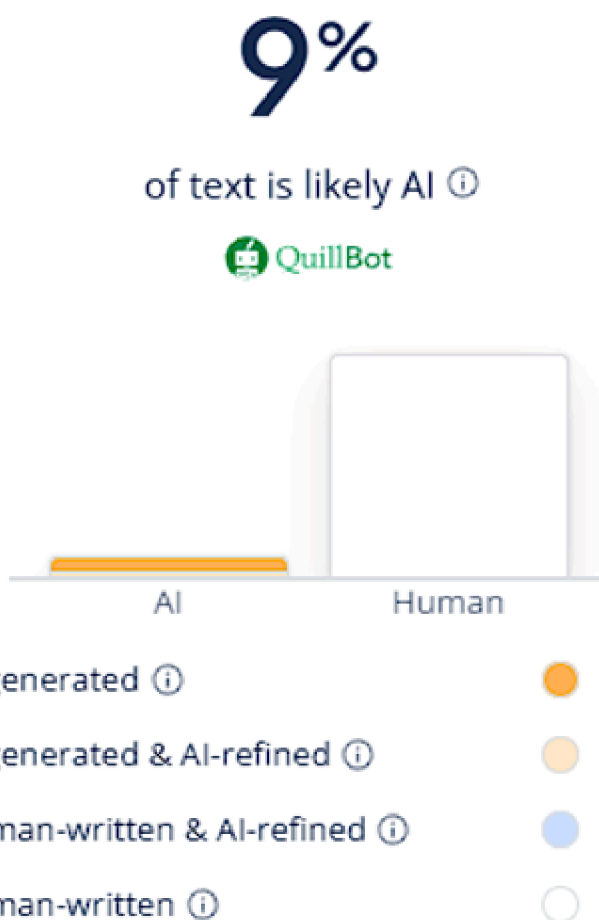
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