Velammal
College of Engineering and Technology
(Autonomous)
Viraganoor, Madurai-625 009

Department of Computer Science and Engineering

Academic Year: 2022-23 (Even Semester)

Lab Manual

Course Code/Name: 21CS212-Internet Programming Laboratory

Prepared by,

Course in charge

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Vision and Mission of the Department and Institute

Institute Vision and Mission

Vision

To emerge and sustain as a Center of Excellence for Technical and Managerial Education upholding social values

Mission

Our aspirants are

- Imparted with comprehensive, innovative and value-based education.
- Exposed to technical, managerial and soft skill resources with emphasis on research, and professionalism.
- Inculcated with the need for a disciplined, happy, married and peaceful life.

Department Vision and Mission

Vision

To become a Center of Excellence in the field of Computer Science and Engineering upholding social values.

Mission

- Heightening the knowledge of the faculty in recent trends through continuous development programmes.
- Transforming the students into globally competent and technically well-equipped Computer Professionals with strong theoretical and practical knowledge.
- Cultivating the spirit of social and ethical values for the cause of development of our Nation.

Program Educational Outcome

Program Educational Objectives (PEOs): (Regulation 2017 – Prescribed by Anna University)

PEO 1	To enable graduates to pursue higher education and research, or have a successful career in industries associated with Computer Science and Engineering, or as entrepreneurs.
PEO 2	To ensure that graduates will have the ability and attitude to adapt to emerging technological changes.

Program Specific Outcomes

PSOs for (Regulation 2017 – Prescribed by Anna University)

PSO1. To analyze, design and develop computing solutions by applying foundational concepts of Computer Science and Engineering.

PSO2. To apply software engineering principles and practices for developing quality software for scientific and business applications.

PSO3. To adapt to emerging Information and Communication Technologies (ICT) to innovate ideas and solutions to existing/novel problems.

Program Outcomes for both R2013 and R2017

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling to complex engineering activities, with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with t h e society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Table of Contents

VELAMMAL COLLEGE OF ENGINEERING AND TECHNOLOGY
Department Of Computer Science and Engineering
Dos and Don'ts

1. Wearing T-shirts and in formals are strictly prohibited.
2. Keep all the belongings, such as bags, lunch box and food materials outside the lab.
3. On any circumstances private Laptop, Pen drive, CD, Notebooks are not allowed inside the lab without prior permission of HoD-CSE.
4. Wearing ID Cards is compulsory. Entry will not be permitted, in case of not having the ID cards.
5. On any account usage of a single PC by two or more students is prohibited.
6. Maintain a high degree of discipline inside the lab, by not roaming and making unwanted noises.
7. In case of any difficulty in using the systems, contact only the Lab Instructor.
8. Chatting and viewing any video content pages are strictly prohibited. In case of violation, serious action will be taken.
9. Remove the footwear and keep it outside only on shoe-rack.
10. Register the usage timing along with signature in the Login Register.
11. Conversation between boys and girls should be strictly avoided. Students violating will be punished seriously.
12. Co-operate with the lab instructor in maintaining the rules and regulations, and pave the way for effective utilization of lab.

Motivation of the course

The purpose of this lab aims at providing students the knowledge about the Internet Programming Tools, and to give the information about the importance of internet technologies, to make them understand the basic HTML tags, to give ability to design web pages, also to give them ability to use the programming language in order to create dynamic web pages, and associating it with the database for publishing the websites and giving the ability to gain knowledge about the Internet skills.

Objective of the course

The student should be made to:
CO1: Construct Web pages using HTML/XML and style sheets (K3).
CO2: Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms (K3).
CO3: Prepare dynamic web pages using server side scripting (K3).
CO4: Make use of PHP programming to develop web applications (K3).
CO5: Develop web applications using AJAX and web services (K3).

Outcome of the course

Upon successful completion of this course, students will

CO1: Construct Web pages using HTML/XML and style sheets.
CO2: Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms.
CO3: Develop dynamic web pages using server side scripting.
CO4: Use PHP programming to develop web applications.
CO5: Construct web applications using AJAX and web services.

Pre-requisite of the course

- Basic knowledge in networking concepts.
- Experience with Core Java programming.

Syllabi of the course

21CS212-Internet Programming Laboratory **L T P C**
0 0 3 2

LIST OF EXPERIMENTS

1. Create a web page with the following using HTML
   i. To embed an image in a web page
   ii. To fix the hot spots in that image
   iii. Show all the related information when the hot spots are clicked.
2. Create a web page with the following
   i. Cascading style sheets.
   ii. Embedded style sheets.
   iii. Inline style sheets..
3. Form validation using JavaScript.
4. Access and Modify web page using JQuery effects.
5. Write programs in Java using Servlets
   i. To invoke servlets from HTML forms
   ii. Session tracking using hidden form fields and cookies
6. Write programs in Java to create three-tier applications using servlets. Assume that the information is available in a database server.
7. Server side programs using JSTL.
8. i. Validate the form using PHP regular expression.
   ii. Creating AJAX application using PHP and MYSQL
9. i. Validating XML using XML Schema
   ii. Transforming XML using XSL and XSLT
10. Creating, publishing and testing web services

TOTAL: 60 PERIODS

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS
Standalone desktops with Netbeans IDE 30 Nos.

Requirements

- Netbeans IDE

Evaluation Procedure

- The lab questions given under each exercise will cover the concepts
- Students have to complete the exercises within the lab hours. In case if the exercises cannot be completed, they can show the output within two days. Marks will be awarded for the output based on the uniqueness. Output will be assessed in person.
- Observation and Record have to be completed and get corrected from the faculty within that week.
- Completed Observation and Record have to be submitted in the next lab session.

Assessment Scheme to be followed in this Lab

Observation Rubrics:

Coding(10)	
Output(5)	
Viva(5)	
Total(20)	
Initial	

Record Rubrics:

Observation(20)	
Record(5)	
Total(25)	
Initial	

Experiments and COs Mapping

S.No	Name of the Experiment	Mapping With CO's
1.	Create a web page with the following using HTML a. To embed a map in a web page b. To fix the hot spots in that map c. Show all the related information when the hot spots are clicked.	CO1
2.	Create a web page with the following a. Cascading Style sheets b. Embedded style sheets c. Inline style sheets. Use our college information for the web pages.	CO1
3.	Form validation using JavaScript.	CO2
4.	Access and Modify web page using JQuery effects.	CO2
5.	Write programs in java using servlets: a. To invoke servlets from HTML forms. b. Session tracking using hidden form fields and cookies	CO3
6.	Write programs in Java to create three-tier applications using servlets. Assume that the information is available in a database server.	CO3
7.	Server side programs using JSTL.	CO3
8.	i. Validate the form using PHP regular expression. ii. Creating AJAX application using PHP and MYSQL	CO4
9.	i. Validating XML using XML Schema ii. Transforming XML using XSL and XSLT	CO5
10.	Creating, publishing and testing web services	CO5

Experiment 1

Aim:

To write a map and fix the hotspots to show the information of it in a web page.

Procedure:

1. Start the program.
2. Get the india map image and link it to the package.
3. Fix the hotspots in that image.
4. Map the reference of the hotspots in the image.
5. Mention the derived link.
6. Click the link to get the desired image.
7. Stop the program.

Requirements:

- Standalone desktops

Concepts Involved:

An *image map* is an image that has been divided into regions called *hotspots*; when a user clicks a hotspot, an action occurs (for example, a new file opens).

Client-side image maps store the hypertext link information in the HTML document—not in a separate map file as server-side image maps do. When a site visitor clicks a hotspot in the image, the associated URL is sent directly to the server. This makes client-side image maps faster than server-side image maps, because the server does not need to interpret where the visitor clicked.

Viva-Voce Questions

1. **What is hotspot in HTML?**
2. **What is an image map hotspot?**
3. **Which tags are used in client side image maps?**

Experiment 2 STYLE SHEET

Aim:
To write a webpage that displays college information using various style sheet.

Procedure:
1. Start the program.
2. Create a web page with framesets consisting two frames.
3. In the first frame include the links.
4. In the second frameset display the webpage of the link.
5. Create a external style sheets.
6. Create a inline and internal style and make a link to the external style sheet.
7. Stop the program..

Requirements:
- Standalone desktops

Concepts Involved:
- Cascading Style Sheet(CSS) is used to set the style in web pages which contain HTML elements. It sets the background color, font-size, font-family, color, … etc property of elements in a web pages.
  There are three types of CSS which are given below:
- Inline CSS
- Internal or Embedded CSS
- External CSS

Inline CSS: Inline CSS contains the CSS property in the body section attached with element is known as inline CSS.
Internal or Embedded CSS: This can be used when a single HTML document must be styled uniquely.
External CSS: External CSS contains separate CSS file which contains only style property with the help of tag attributes (For example class, id, heading, … etc). CSS property written in a separate file with .css extension and should be linked to the HTML document using **link** tag.

Viva-Voce Questions
1. What is CSS?
2. What are the different variations of CSS?
3. How can you integrate CSS on a web page?
4. What is Embedded Style Sheet?
5. In how many ways can a css be integrated as a web page?

Experiment 3 FORM VALIDATION

Aim:

To write a Javascript code for creating the web page for validating the web form.

Procedure:

1. The form will include one text field called "Your Name", and a submit button.
2. Validation script will ensure that the user enters their name before the form is sent to the server
3. Open this page to see it in action.
4. Try pressing the Send Details button without filling anything in the "Your Name" field.
5. You might like to open the source code for this form in a separate window
6. The page consists of a JavaScript function called validate_form() that performs the form validation, followed by the form itself.

Requirements:

- Standalone desktops

Concepts Involved:

We will create JavaScript functions (one for each input field whose value is to validate) which check whether a value submitted by user passes the validation. All those functions are called from another function. It sets the focus to the input field until the user supplies a valid value. When the user does so, they may proceed and can supply value to the next available field. The later JavaScript function created is called on the on submit event of the form.

Viva-Voce Questions

1. Is JavaScript is scripting language?
2. What is object oriented language?
3. What is form validation?

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Experiment 4 JQuery

Aim:

jQuery is a lightweight, "write less, do more", JavaScript library.
The purpose of jQuery is to make it much easier to use JavaScript on your website.
jQuery takes a lot of common tasks that require many lines of JavaScript code to accomplish, and wraps them into methods that you can call with a single line of code.
jQuery also simplifies a lot of the complicated things from JavaScript, like AJAX calls and DOM manipulation.

Procedure:

The jQuery syntax is tailor-made for **selecting** HTML elements and performing some **action** on the element(s).
Basic syntax is: **$(*selector*).*action*()**

- A $ sign to define/access jQuery
- A (*selector*) to "query (or find)" HTML elements
- A jQuery *action*() to be performed on the element(s)

The Document Ready Event
You might have noticed that all jQuery methods in our examples, are inside a document ready event:

```
$(document).ready(function(){

  // jQuery methods go here...

});
```

This is to prevent any jQuery code from running before the document is finished loading (is ready).
It is good practice to wait for the document to be fully loaded and ready before working with it. This also allows you to have your JavaScript code before the body of your document, in the head section.
Here are some examples of actions that can fail if methods are run before the document is fully loaded:

- Trying to hide an element that is not created yet
- Trying to get the size of an image that is not loaded yet

Concepts Involved:

GET vs. POST
The two most common "methods" for sending a request to a server are GET and POST. It's important to understand the proper application of each.
The GET method should be used for non-destructive operations — that is, operations where you are only "getting" data from the server, not changing data on the server. For example, a query to a search service might be a GET request. GET requests may be cached by the browser, which can lead to unpredictable behavior if you are not expecting it. GET requests generally send all of their data in a query string.
The POST method should be used for destructive operations — that is, operations where you are changing data on the server. For example, a user saving a blog post should be a POST request. POST requests are generally not cached by the browser; a query string can be part of the URL, but the data tends to be sent separately as post data.
link**Data Types**
jQuery generally requires some instruction as to the type of data you expect to get back from an Ajax request; in some cases the data type is specified by the method name, and in other cases it is provided as part of a configuration object. There are several options:
link**text**
For transporting simple strings.

link**html**
For transporting blocks of HTML to be placed on the page.
link**script**
For adding a new script to the page.
link**json**
For transporting JSON-formatted data, which can include strings, arrays, and objects.
Note: As of jQuery 1.4, if the JSON data sent by your server isn't properly formatted, the request may fail silently. See http://json.org for details on properly formatting JSON, but as a general rule, use built-in language methods for generating JSON on the server to avoid syntax issues.
link**jsonp**
For transporting JSON data from another domain.
link**xml**
For transporting data in a custom XML schema.
Consider using the JSON format in most cases, as it provides the most flexibility. It is especially useful for sending both HTML and data at the same time.
A is for Asynchronous
The a synchronicity of Ajax catches many new jQuery users off guard. Because Ajax calls are asynchronous by default, the response is not immediately available. Responses can only be handled using a callback. So, for example, the following code will not work:

```
1  varresponse;
2
3  $.get( "foo.php", function( r ) {
4     response = r;
5  });
6
7  console.log( response ); // undefined
```

Viva-Voce Questions

1. What is JQuery?
2. List Some advantages of JQuery.
3. How is JQuery different from other Javascript frameworks?
4. What is the $() function in the jQuery library?
5. What is the exact difference between the methods onload() and document.ready()?

Experiment 5A INVOKING SERVLET FROM HTML FORMS

Aim:

- To write a java program for invoking servlet from HTML form.

Procedure:

1. Start the program.
2. Create the form as ResponseDemoServlet with textfield,submit Button and reset button.
3. The class ResponseDemoServlet implements the interface servlet.
4. Create the out object for the PrintWriter class and call the method Getwriter as response.getwriter.
5. Display the server port, server name, protocol, character encoding, content length.
6. Create the class as enumeration with parameters as object.
7. Stop the program

Requirements:

- Standalone desktops

Concepts Involved:

Servlet is an interface that must be implemented for creating any Servlet. Servlet is a class that extends the capabilities of the servers and responds to the incoming requests. It can respond to any requests. Servlet is a web component that is deployed on the server to create a dynamic web page.

Viva-Voce Questions

1. What is servlet?
2. What is different between web server and application server?
3. Which HTTP method is non-idempotent?
4. What is the difference between GET and POST method?
5. What is MIME Type?

Experiment 5B

Aim:

- To write a java servlet program for session tracking using hidden form fields and track the session for a hit count.

Procedure:

Step 1: Import all the necessary packages.
Step 2: Declare a class FirstServlet1 that extends HttpServlet.
step 3: In hidden form field a hidden (invisible) textfield is used for maintaining the state of an user.)
Step 4: We are storing the name of the user in a hidden textfield and getting that value from another servlet.
Step 5: After entering the name from the HTML page, it goes to the first servlet. First Servlet gets the name and sends as an invisible text field to the servlet2.
Step 6: Second servlet accepts the hidden text field and constructs the invisible text.

Hit Count
Procedure

Step 1: Import all the necessary packages.
Step 2: Declare a class PAGEHIT Counter that extends HttpServlet
Step 3: Use init parameter and reset hit count as 0 hitcount=0;
Step 4: Set response content type and this method excutes whenever the servlet is hit, by incrementing a hit count.
Step 5: Stop the program.

Requirements:

- Standalone desktops

Concepts Involved:

Servlet is an interface that must be implemented for creating any Servlet. Servlet is a class that extends the capabilities of the servers and responds to the incoming requests. It can respond to any requests. Servlet is a web component that is deployed on the server to create a dynamic web page.

Viva-Voce Questions

1. What is servlet?
2. What is different between web server and application server?
3. Which HTTP method is non-idempotent?
4. What is the difference between GET and POST method?
5. What is MIME Type?

Experiment 6 **Three-Tier Applications**

Aim:

To write the SERVLET program for online examination

Procedure:

1. Start the program.
2. With the scriplet tag, include information like document Created on and author.
3. Set the content type using page content type=”txt\html”.
4. Include the doctype with transitional flavor.
5. Get the input as regno, name and store in the table.
6. Create the forms as exam and index.
7. Click the submit button, after completing all the questions. If the answers are correct it will display as correct else incorrect.
8. Stop the program

Requirements:

- Standalone desktops

Concepts Involved:

JavaServer Pages often serve the same purpose as programs implemented using the Common Gateway Interface (CGI). But JSP offers several advantages in comparison with the CGI. Performance is significantly better because JSP allows embedding Dynamic Elements in HTML Pages itself instead of having separate CGI files.JSP are always compiled before they are processed by the server unlike CGI/Perl which requires the server to load an interpreter and the target script each time the page is requested. Java Server Pages are built on top of the Java Servlets API, so like Servlets, JSP also has access to all the powerful Enterprise Java APIs, including JDBC, JNDI, EJB, JAXP, etc.JSP pages can be used in combination with servlets that handle the business logic, the model supported by Java servlet template engines. Finally, JSP is an integral part of Java EE, a complete platform for enterprise class applications. This means that JSP can play a part in the simplest applications to the most complex and demanding

Viva-Voce Questions

1. What is SERVLET?
2. Which HTTP method is non-idempotent?
3. What is the difference between GET and POST method?
4. How can we handle the exceptions in SERVLET?
5. How can we forward the request from JSP page to the servlet?

Experiment 7 JSTL

Aim:

Design and develop JSP application to demonstrate 1. JSP Scripting elements 2. JSP Directives 3. JSP Implicit Objects 4. JSP Action tags

Procedure:

1. Develop web pages
2. Create and save data at the server, which contain some users information
3. Install TOMCAT web server
4. Use JSTL tag to implement various operations.

Concepts Involved:

JSP technology is used to create web application just like Servlet technology. It can be thought of as an extension to Servlet because it provides more functionality than servlet such as expression language, JSTL, etc.

A JSP page consists of HTML tags and JSP tags. The JSP pages are easier to maintain than Servlet because we can separate designing and development.

It provides some additional features such as Expression Language, Custom Tags, etc.

Viva-Voce Questions

1. What is JSTL?
2. What are the types of JSTL?
3. How can we handle the exceptions in JSTL
4. ?
5. How can we forward the request from JSP page to the servlet?

Experiment 8 Validate the form using PHP regular expression and PHP stores a form data into database.

Aim:

To Validate the form using PHP regular expression

Procedure:

1. Start the program.
2. A scripting language that is commonly hosted in a browser to add Interactivity to HTML PAGES.
3. Defines the structure of a webpage as a set of programmable objects that can be accessed through javascript.
4. Allows a client-side script to perform and httprequest.
5. AJAX applications use xmlhttprequest object to perform asynchronous requests to the server as opposed to performing a full page refresh.
6. Display the result.
7. Stop the program

Requirements:

- Standalone desktops

Concepts Involved:

Regular expressions simplify identifying patterns in string data by calling a single function. This saves us coding time. When validating user input such as email address, domain names, telephone numbers, IP addresses Highlighting keywords in search results When creating a custom HTML template. Regular expressions can be used to identify the template tags and replace them with actual data.

Viva-Voce Questions

1. What are Java Regex ?
2. What is PHP?
3. How do you execute a PHP script from the command line?
4. How to run the interactive PHP shell from the command line interface?

Experiment 9 XML document

Aim:

To Create and save an XML document at the server, which contains 10 users Information. Write a Program, which takes user Id as an input and returns the User details by taking the user information from the XML document.

Procedure:

1. Develop static pages
2. Create and save an XML document at the server,which contain some users information
3. Install TOMCAT web server
4. Redo the previous task using JSP by converting the static web pages of assignments 2 into dynamic web pages.
5. Implement.

Concepts Involved:

The standard for accessing and processing XML documents is the XML Document Object Model or *DOM*. The DOM represents elements, attributes and text within elements as nodes in a tree. Simplified DOM representation of the XML document. With a DOM API, we can process an XML document by starting at the root element and then descending down the tree from parents to children. Double slashes indicate that an arbitrary number of elements can intervene on a path: `play//scene` selects all scene elements occurring in a play element.

Viva-Voce Questions

1. What is a markup language?
2. What is XML?
3. What are the features of XML?
4. What are the differences between HTML and XML?

Experiment 10 WEB SERVICES

Aim:

To implement a application using the web services.

Procedure:

1. Start the program
2. Create a root process for reservation
3. Create a service with focus on each item
4. Run the program, display the result
5. Stop the program.

Requirements:

- Standalone desktops

Concepts Involved:

'Web services' which actually acts as a means of communication between these multiple web applications developed with different programming languages. We services use a standardized XML messaging system that is easily available over the internet or private networks.

Viva-Voce Questions

1. What is Web services?
2. What are the components of webservice?
3. What do you know about RESTful Web Services?