ADMINISTRATIVE MANAGEMENT COLLEGE
18th KM, Bannerghatta Road, Bangalore - 560083

Perl / CGI Programming

Course Description

Perl is a powerful and flexible scripting language. Perl is an interpreted language and this makes Perl highly suitable for CGI scripting. CGI stands for Common Gateway Interface. It allows a program, written in any language interact with users via the World Wide Web. Because of Perl's amazingly powerful text processing features and because it is so easy to write Perl programs, Perl has become the clear language of choice for writing CGI scripts.

This Perl/CGI course bridges the gap between using HTML to create static Web pages and using Perl CGI scripts to create dynamic Web pages. The course emphasizes using the Perl 5 CGI library routines to process HTML forms by providing extensive working examples and intensive practical sessions.

Course Requirements

- Familiarity with HTML forms.
- Basic UNIX skills and the ability to use VI or a basic text editor

Course Duration

Lecture Hours: 14
Practical Hours: 20
Total Hours: 34

Course Contents:

The Internet and the Web

- TCP/IP and Ports
- DNS vs. Hosts Files
- Servers and Clients
- Client/Server Protocols

Browsers and Servers

- URLs
- WEB Browsers and Servers
- The Hypertext Transfer Protocol
- HTTP Requests and Responses
- HTTP Headers
- HTTP Requests

Introduction to CGI

- HTML Tag Structure
- HTML Document Structure
- URLs and CGI
- CGI Programs
- Running and Debugging from the Command Line
- Running and Debugging from a Browser
- Handling an HTML Form with CGI
- Generating HTML

CGI and Perl

- Perl Programs
- Why Use CGI.pm (and Where is It?)
- Running and Debugging from the Command Line
- Generating HTML with CGI.pm
- Running and Debugging from a Browser
- Command Line Debugging

Generating HTML

- Introduction to CGI.pm
- How to use CGI.pm's Online Documentation
- CGI.pm's Rules for General HTML Tags
- CGI.pm's Rules for HTML Form Tags
- Named vs. Positional Parameters in CGI.pm

Generating Forms

- General Structure of HTML Forms
- Form Element Tags
- Pushbuttons
- Radiobuttons
- Checkboxes
- Popups and Listboxes

- Textfields, Passwords, and Textareas

CGI Data Flow Architecture

- URL Encoding and Decoding
- Data Flow between Browsers and Servers
- GET vs. POST
- CGI Environment Variables
- Accessing CGI's Environment Variables

Processing Form Data

- Static Forms
- Dynamic Forms
- Controlling Flow with User Input
- Accessing Form Data Using CGI.pm
- The param Method of CGI.pm
- Sticky Widgets
- Validating Input from the Browser
- Lists
- Scalar and List Contexts
- Hashes
- Hash Functions

Client-side Statefulness

- Stateful vs. Stateless
- Why use Stateful CGI Applications?
- Program to Program Interaction
- Stateful Access with Hidden Fields
- Multiple Forms and Hidden Fields
- Stateful Access with Netscape Cookies
- Using Cookies with CGI.pm
- Cookie Management

Database Access

- Server-side Statefulness
- Flat-file Databases
- Structuring Text Data
- File Permissions and Flat-file Databases
- Perl's DBM Interface
- Perl's DBI/DBD Interface
- Issues with Statefulness

Additional Web Programming Features

- Extra Path Information
- Frames
- Server Side Includes (SSI)
- The exec command
- A Page Hit Counter Using SSI
- Animation Description
- Netscape's Server Push
- Client Pull
- The GD.pm Module

CGI Security Issues

- Browser to Server Security Issues
- CGI Security Issues
- CGI Interaction with the Operating System
- Database/File System Overflow
- CGI and User Authentication

Course Materials

1. CGI Reference Guide, by David Alpert, published by FAS Computer Services.
2. Programming Perl, 2nd ed. (Camel), by Larry Wall, Tom Christiansen, and Randal L. Schwartz, published by O'Reilly and Associates, Inc.
3. Learning Perl, 2nd ed. (Llama), by Randal L. Schwartz and Tom Christiansen, published by O'Reilly and Associates, Inc.
4. The Perl Cookbook, by Tom Christiansen and Nathan Torkington, published by O'Reilly and Associates, Inc.

Grading Policy

At the end of course, the student has to implement a project review exam will be conducted. Students will successfully complete this course by mastering all learning outcomes with 70% or higher overall grade.

COURSE OUTCOME:

On successful completion of the course the student will be able to:

- Generate simple web pages using Perl
- Process data from HTML forms using the CGI module
- Use the CGI module for applications such as data validation, simple "wizard" interfaces, and file uploads.