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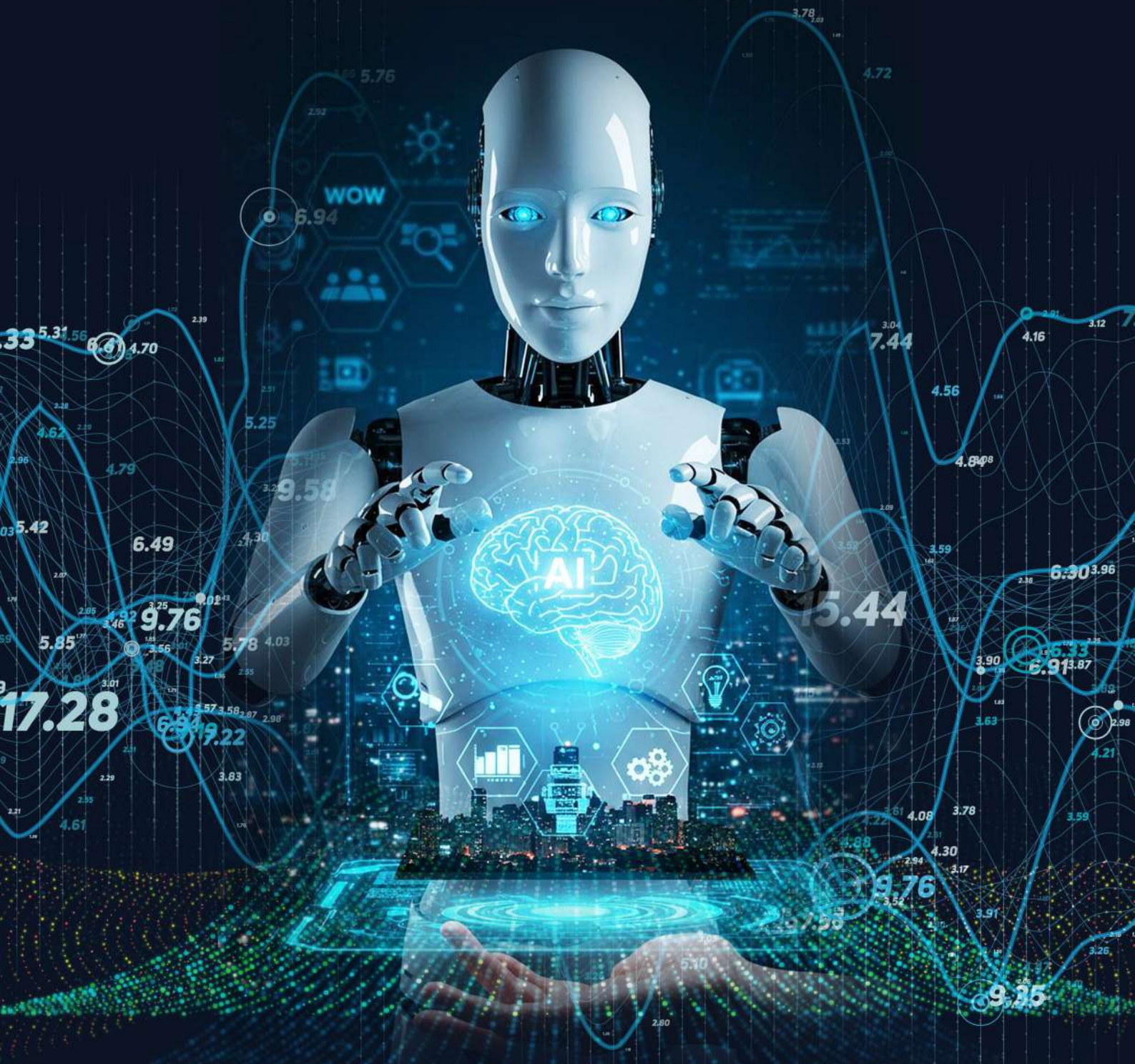
AGENTIC AI

01 Year Diploma



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PNY Trainings is the first choice of students who want to excel in the field of Internet Marketing. PNY Trainings consists of top-level trainers who are adept in the fields of Internet Marketing. We are the pioneer institute that started comprehensive training for the benefit of students. Since our launch, hundreds of students have been trained and secured good jobs in the expanding IT industry, as we all know. Contact us and Secure your seat for upcoming trainings, events, and seminars.

Our Strength:

- *International Collaborations*
- *Awarded by USA Education 2.0*
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Company: (SEO Marketer in NGO)

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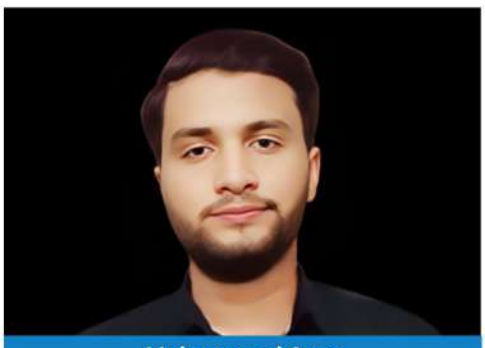

Muhammad Anas
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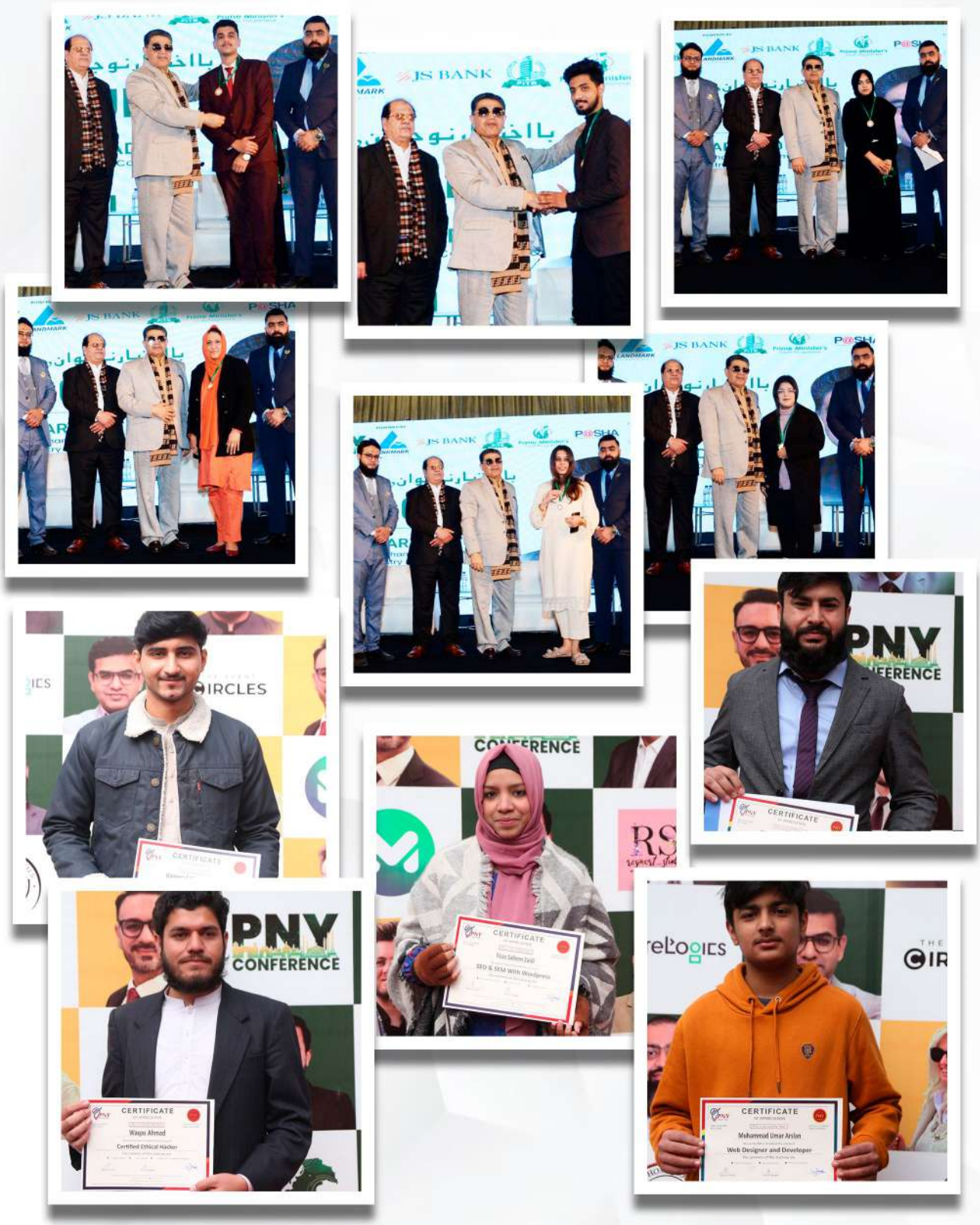

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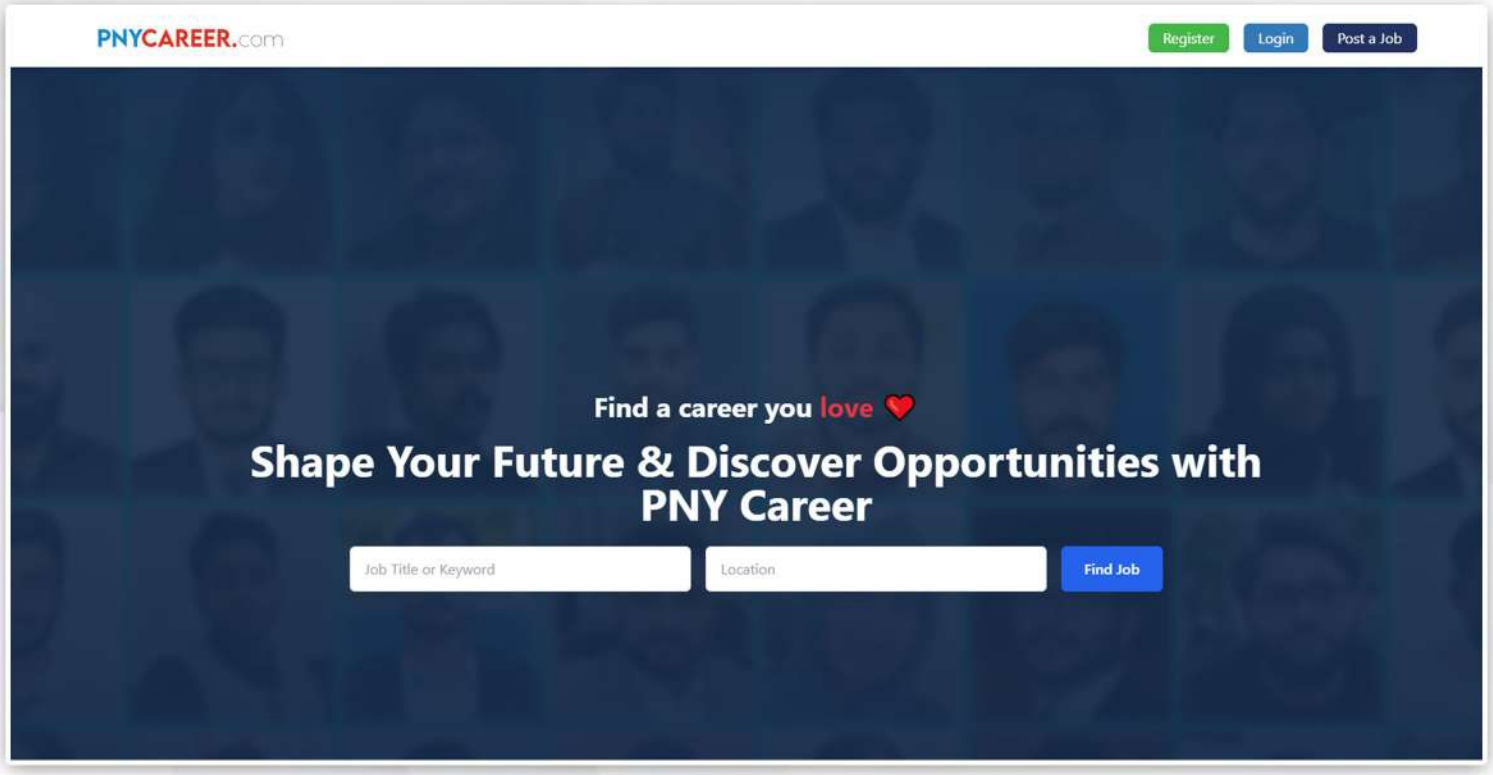

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SALIENT FEATURES

PNY Trainings

Practical learning

Learning Management System

Follow-Up Sessions

Internships/Jobs Opportunities

Expert Mentorship

What will You Learn?

In the Agentic AI course, you will explore how intelligent agents think, reason, and act to perform real-world tasks. From mastering prompt engineering and memory handling to integrating APIs and external tools, you will learn to design AI systems that work like digital co-workers. The course covers autonomous workflows, multi-agent collaboration, and real-world applications such as business automation, data analysis, and customer support. With a strong focus on ethics and safety, you'll be equipped to build, deploy, and manage reliable AI agents that bring efficiency, innovation, and smart decision-making to any industry.

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Course Outline

MONTHS 1-2: PYTHON PROGRAMMING & OOP (WEEKS 1-8)

MODULE 1: PYTHON BASICS (WEEKS 1-4)

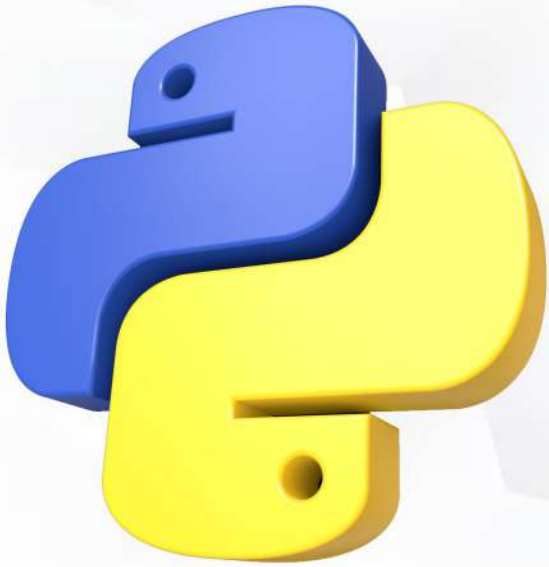
Week 1:

Class 1: Python Setup & Syntax

> Installing Python 3.10+ and VS Code
> Writing first program: print(), comments
> Python syntax rules and indentation

Class 2: Variables & Data Types

> Variables naming conventions
> Data types: int, float, string, bool
> Type conversion, input() function



Week 2:

o Class 1: Operators

> Arithmetic (+, -, *, /, //, %, **)
> Comparison (==, !=, >, <, >=, <=)
> Logical (and, or, not)

o Class 2: Strings

> String methods: upper(), lower(), strip(), replace()
> String formatting with f-strings
> String slicing and indexing

Week 3:

o Class 1: Conditional Statements

> if, elif, else statements
> Nested conditions
> Multiple conditions with logical operators

o Class 2: For Loops

> for loop with range()
> Iterating through strings and lists
> break and continue statements

Week 4:

o Class 1: While Loops

> while loop syntax
> Loop control statements
> Avoiding infinite loops

o Class 2: Lists Part 1

> List creation and indexing
> List methods: append(), insert(), remove(), pop()
> List slicing

Mini Project 1: Simple To-Do List Application

MODULE 2: DATA STRUCTURES & FUNCTIONS (WEEKS 5-6)

- **Week 5:**

o Class 1: Lists Part 2

> sort(), reverse(), copy() methods
> List comprehensions
> len(), min(), max(), sum() functions

o Class 2: Tuples & Sets

> Tuple creation and usage
> Sets: unique collections, set operations
> When to use each data structure

Week 6:

o Class 1: Dictionaries Part 1

> Key-value pairs, accessing items
> Dictionary methods: keys(), values(), items()

o Class 2: Dictionaries Part 2

> Nested dictionaries
> Dictionary comprehensions
> Iterating through dictionaries

Mini Project 2: Contact Management System

MODULE 3: FUNCTIONS & OOP (WEEKS 7-8)

- **Week 7:**

o Class 1: Functions Part 1

> Defining and calling functions
> Parameters and return values
> Function scope

o Class 2: Functions Part 2

> Default parameters
> *args and **kwargs
> Lambda functions

Week 8:

- **Class 1: OOP Introduction**
  - > Classes and objects
  - > init method, self parameter
  - > Instance variables and methods
- **Class 2: OOP Concepts**
  - > Inheritance basics
  - > Method overriding
  - > Encapsulation and str method

Mini Project 3: Library Management System (OOP-based)

MONTH 3: HTML & CSS (WEEKS 9-12)

MODULE 4: HTML FUNDAMENTALS (WEEKS 9-10)

Week 9:

- **Class 1: HTML Basics Part 1**
  - > HTML document structure
  - > Headings, paragraphs, text formatting
  - > Lists: ordered and unordered
- **Class 2: HTML Basics Part 2**
  - > Links and navigation
  - > Images and attributes
  - > Tables creation

Week 10:

- **Class 1: HTML Forms**
  - > Form elements: input, textarea, select, button
  - > Input types: text, email, password, number, date
  - > Form attributes: action, method
- **Class 2: Semantic HTML**
  - > Semantic tags: header, nav, section, article, footer
  - > Div and span elements
  - > HTML5 best practices

Mini Project 4: Multi-page HTML Website

MODULE 5: CSS STYLING (WEEKS 11-12)

Week 11:

- **Class 1: CSS Basics**
  - > CSS syntax and selectors
  - > Colors, fonts, text styling
  - > Background properties

o Class 2: CSS Box Model & Layout
> Box model: margin, padding, border
> Display property
> Width and height properties

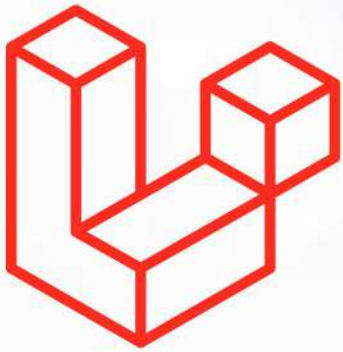
Week 12:
o Class 1: CSS Flexbox
> Flexbox container properties
> justify-content, align-items
> flex-direction, flex-wrap
o Class 2: Responsive Design
> Media queries
> Mobile-first approach
> Responsive units: %, vh, vw

Mini Project 5: Responsive Portfolio Website

MONTHS 4-5: TAILWIND CSS, JAVASCRIPT & API INTEGRATION (WEEKS 13-20)

MODULE 6: TAILWIND CSS (WEEKS 13-14)

Week 13:
o Class 1: Tailwind Introduction
> Utility-first framework concept
> Setting up Tailwind with CDN
> Basic utilities: text, colors, spacing
o Class 2: Tailwind Layout & Components
> Flexbox utilities
> Grid utilities
> Spacing system: p-, m-, gap-



Week 14:
o Class 1: Tailwind Responsive Design
> Responsive prefixes: sm:, md:, lg:, xl:
> Mobile-first workflow
> Responsive navigation
o Class 2: Tailwind Advanced Features
> Hover, focus, active states
> Transitions and animations
> Custom configurations

Mini Project 6: Modern Landing Page with Tailwind

MODULE 7: JAVASCRIPT FOR BACKEND INTEGRATION (WEEKS 15-16)

Week 15:

o Class 1: JS Basics & DOM Manipulation

> JavaScript syntax, variables, data types
> Selecting elements: getElementById, querySelector
> Event handling: onclick, onsubmit

o Class 2: Async JavaScript & APIs

> What are APIs? HTTP methods (GET, POST)
> Introduction to fetch() and Promises
> Consuming public APIs (JSONPlaceholder)

Week 16:

o Class 1: Building Dynamic Frontend

> Getting data from API and displaying on webpage
> Handling user input and sending data
> Error handling in API calls

o Class 2: Integration Project

> Connecting multiple APIs
> Creating interactive UI

Mini Project 7: Dynamic Web Application with API Integration

MODULE 8: API DEVELOPMENT WITH FASTAPI (WEEKS 17-20)

Week 17:

o Class 1: FastAPI Basics

> Installing FastAPI and Uvicorn
> Creating first API endpoint
> Path parameters and query parameters

o Class 2: FastAPI CRUD Operations

> Building CRUD API for resources
> HTTP status codes
> Error handling

Week 18:

o Class 1: FastAPI Basics

> Installing FastAPI and Uvicorn
> Creating first API endpoint
> Path parameters and query parameters

o Class 2: FastAPI CRUD Operations

> Building CRUD API for resources
> HTTP status codes
> Error handling

Week 19: Review & Advanced Backend Concepts
> Class 1: Request Body with Pydantic
> Class 2: Response Models and Validation
Week 20: Capstone for Months 4-5
> Class 1: Project Planning & Setup
> Class 2: Project Implementation & Review

Mini Project 8: Full-Stack Blog Application

MONTHS 6-12: AI & AGENTIC AI SYSTEMS (WEEKS 21-48)

MODULE 9: AI & LLM FUNDAMENTALS (WEEKS 21-24)

Week 21:
o Class 1: Introduction to AI
> What is Artificial Intelligence?
> Machine Learning overview
> AI applications in real world
o Class 2: Large Language Models (LLMs)
> What are LLMs: GPT, Claude, Gemini
> How LLMs work (simplified)
> Tokens and context windows

Week 22:
o Class 1: Prompt Engineering Part 1
> Writing effective prompts
> Clear instructions and context
> Few-shot learning with examples
o Class 2: Prompt Engineering Part 2
> Chain of thought prompting
> Role-based prompts
> System vs user messages

Week 23:
o Class 1: Working with OpenAI API
> Getting OpenAI API key
> Installing openai library
> Making first API call
o Class 2: API Security & Best Practices
> Environment variables with python-dotenv
> Securing API keys
> Rate limits and cost management

Week 24:

- **Class 1: Building AI Applications**
  - > Streaming responses
  - > Error handling for AI APIs
  - > Token counting and optimization
- **Class 2: AI Integration Project**
  - > Creating AI-powered features
  - > Integrating AI with existing applications

Mini Project 9: AI-Powered Content Generator

MODULE 10: INTRODUCTION TO AGENTS (WEEKS 25-28)

Week 25:

- **Class 1: What are AI Agents?**
  - > Agent definition and characteristics
  - > Agents vs traditional programs
  - > Agent components: Perception, Reasoning, Action
- **Class 2: Agent Types**
  - > Simple reflex agents
  - > Goal-based agents
  - > Learning agents

Week 26:

- **Class 1: LangChain Introduction**
  - > What is LangChain
  - > Installing and setup
  - > Chains concept and prompt templates
- **Class 2: LangChain Components**
  - > LLMChain basics
  - > Sequential chains
  - > Memory buffers

Week 27:

- **Class 1: Building Simple Agents**
  - > Rule-based agent structure
  - > State management
  - > Decision-making logic
- **Class 2: Agent Tools and Actions**
  - > What are tools in agents
  - > Function calling basics
  - > Tool integration patterns

Week 28:

- **Class 1: LangChain Agents**
  - > Agent executors
  - > ReAct pattern
  - > Building complete agent systems
- **Class 2: Review & Practice**
  - > Agent concepts review
  - > Building personal assistant agent

Mini Project 10: Personal Assistant Agent

MODULE 11: ADVANCED AGENT CONCEPTS (WEEKS 29-32)

Week 29:

- **Class 1: Agent Memory Systems**
  - > Why agents need memory
  - > Conversation history
  - > Memory types in LangChain
- **Class 2: Memory Optimization**
  - > Token-based memory limits
  - > Summary memory
  - > Memory retrieval strategies

Week 30:

- **Class 1: Vector Databases Introduction**
  - > What are embeddings
  - > Vector similarity search
  - > Why vector databases are important
- **Class 2: ChromaDB Basics**
  - > Installing ChromaDB
  - > Storing documents
  - > Querying vectors

Week 31:

- **Class 1: RAG (Retrieval Augmented Generation) Part 1**
  - > What is RAG and why it's important
  - > RAG architecture
  - > Document processing and chunking
- **Class 2: RAG Part 2**
  - > Building RAG pipeline
  - > Query | Retrieve | Generate flow
  - > RAG with LangChain

Week 32:

- **Class 1: Advanced RAG Techniques**
  - > Improving retrieval quality
  - > Metadata filtering
  - > Re-ranking results
- **Class 2: Agent Planning**
  - > Task decomposition
  - > Multi-step reasoning
  - > Planning strategies

Mini Project 11: Knowledge Base Q&A Agent

MODULE 12: MULTI-AGENT SYSTEMS (WEEKS 33-36)

Week 33:

- **Class 1: Multi-Agent Basics**
  - > Why use multiple agents
  - > Agent communication
  - > Coordination strategies
- **Class 2: Agent Roles & Specialization**
  - > Role assignment
  - > Division of labor
  - > Workflow design

Week 34:

- **Class 1: CrewAI Introduction**
  - > What is CrewAI
  - > Installing CrewAI
  - > Agents and Tasks concepts
- **Class 2: CrewAI Agents Configuration**
  - > Agent attributes: role, goal, backstory
  - > Agent capabilities
  - > Tools for agents

Week 35:

- **Class 1: CrewAI Tasks & Workflows**
  - > Task definition
  - > Task dependencies
  - > Sequential execution
- **Class 2: Crew Communication**
  - > Agent-to-agent messaging
  - > Output sharing
  - > Context passing

Week 36:

o Class 1: Error Handling in Crews

> Managing failures
> Retry mechanisms
> Fallback strategies

o Class 2: Crew Optimization

> Performance tuning
> Monitoring activities
> Best practices

Mini Project 12: Content Creation Team (Writer, Editor, Publisher)

MODULE 13: PRACTICAL APPLICATIONS & CAPSTONE (WEEKS 37-48)

- **Weeks 37-40: Advanced Application Development**

> Customer Support Automation Agents
> Data Analysis and Reporting Agents
> Email Processing and Automation Agents
> Research and Information Gathering Agents

- **Weeks 41-44: Ethics & Portfolio Development**

> AI Ethics and Responsible Development
> Agent Safety and Content Filtering
> Performance Optimization
> Portfolio Building and GitHub Best Practices

- **Weeks 45-48: Capstone Project**

> Project Selection and Planning
> Development Phase 1 & 2
> Testing and Refinement
> Final Presentations and Demo Day

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> Portfolio Building and GitHub Best Practices

- **Weeks 45-48: Capstone Project**

> Project Selection and Planning
> Development Phase 1 & 2
> Testing and Refinement
> Final Presentations and Demo Day

Final Capstone Options:

1. AI Customer Support Platform
2. Content Marketing Automation System
3. Personal Learning Assistant
4. Business Intelligence Agent
5. Research Assistant Platform
6. E-commerce Product Manager

REQUIRED TOOLS & TECHNOLOGIES:

- Python 3.10+ with VS Code

- Frontend: HTML5, CSS3, Tailwind CSS, JavaScript

- Backend: FastAPI, Uvicorn

- AI/ML: OpenAI API, LangChain, CrewAI, ChromaDB

- Other: Git, GitHub, Postman

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