

# **K.R. Mangalam University, Gurugram**

*School of Engineering and Technology (SOET)*



**Session 2025-26**

## **Computer Science Fundamentals and Career Pathways**

**Assignment: 5**

***Career planning, Certifications And Industry Readiness***

**Submitted By:**

Name: Kaushal

Roll No.: 2501730085

Course: B. Tech (CSE with ai and ml)

Semester: 1

Section: B

**Submitted To:**

Mr. Aryan Sharma

**Date of Submission: 28 Nov 2025**

# Computational Thinking in Action

## Problem Definition

A Job Application Tracker is needed to help job seekers stay organized while applying to multiple companies. Since applicants often struggle to remember where they applied, the current status of each application, interview schedules, and follow-up dates, the process becomes confusing and unmanageable. To overcome this, a simple system is required that can record job details, update progress, and display all applications in one place, ensuring that users do not miss important opportunities or deadlines.

### **The system should:**

- Allow users to add new job applications with details like company name, role, and date applied.
- Provide an option to update the application status (Applied, Shortlisted, Interview Scheduled, Selected, Rejected).
- Display all saved applications in a clear list format.
- Help users stay organized and avoid missing follow-ups.
- Make the job search process easier, faster, and more systematic

## Algorithm (Pseudocode)

START

Create an empty list JOB\_LIST

REPEAT

Display Menu:

1. Add New Job Application
2. Update Application Status
3. View All Applications
4. Exit

INPUT choice

IF choice = 1 THEN

INPUT Company\_Name

INPUT Job\_Title

INPUT Date\_Applied

SET Status = "Applied"

Create JOB entry {Company, Title, Date, Status}

Add JOB to JOB\_LIST

Display "Job Added Successfully"

ELSE IF choice = 2 THEN

IF JOB\_LIST is empty THEN

Display "No applications found"

ELSE

Display all jobs with index numbers

```
    INPUT job_index

    INPUT new_status

    Update JOB_LIST [job_index].Status = new_status

    Display "Status Updated"

ENDIF

ELSE IF choice = 3 THEN

    IF JOB_LIST is empty THEN

        Display "No applications to show"

    ELSE

        For each job in JOB_LIST

            Display Company, Title, Date, Status

        EndFor

    ENDIF

ELSE IF choice = 4 THEN

    Display "Exiting System"

    EXIT LOOP

ELSE

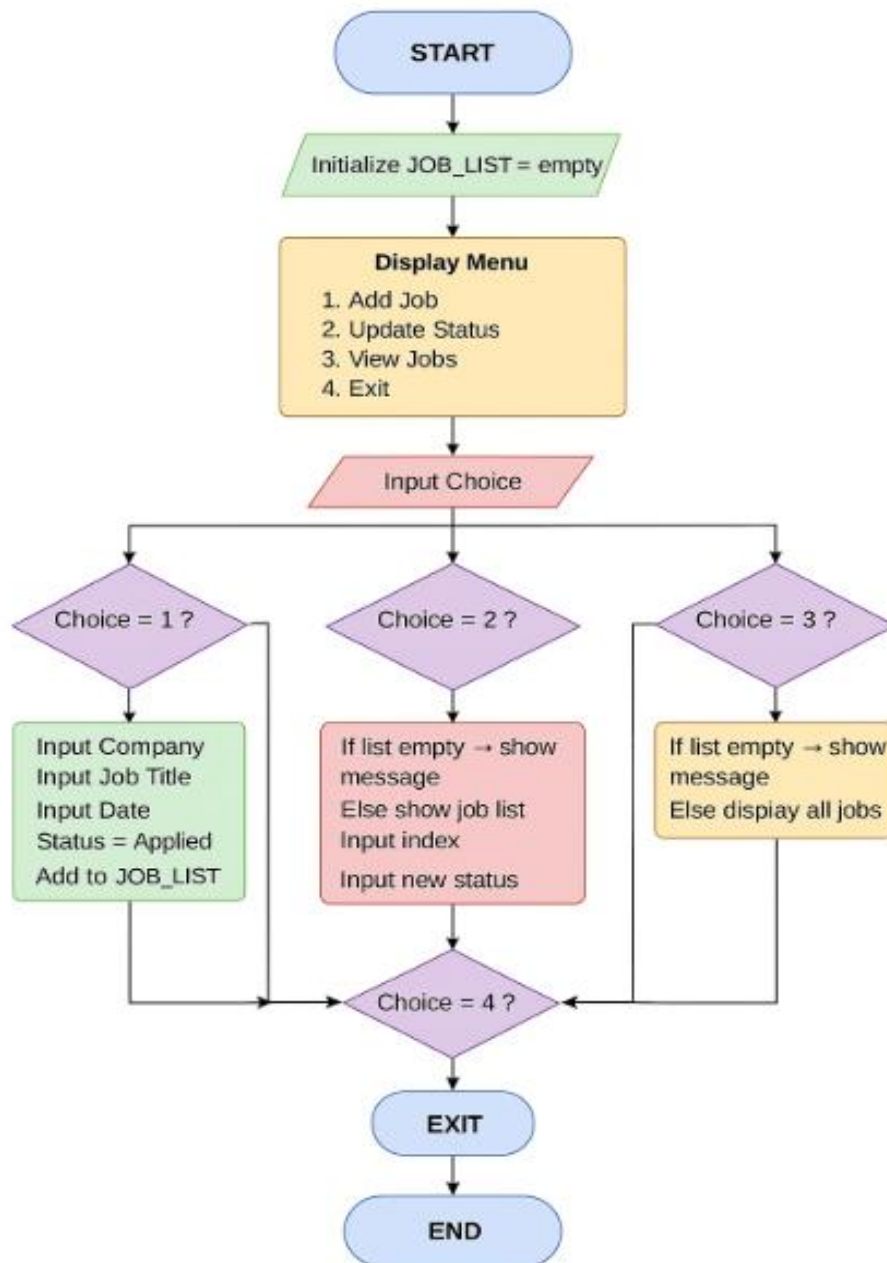
    Display "Invalid Choice"

ENDIF

UNTIL choice = 4

END
```

## Flow chart



# Linux and Automation Practice

## File and Directory Management

### 1. mkdir

- **Syntax:** `mkdir [options] directory_name`
  - **Description:** Creates a new directory.
  - **Example:** `mkdir Projects`
  - **Sample Output:**  
*(No output if successful)*
  - **Explanation:** Used to organize files into directories.
- 

### 2. touch

- **Syntax:** `touch filename`
  - **Description:** Creates an empty file or updates file timestamp.
  - **Example:** `touch file2.txt`
  - **Sample Output:**  
*(No output; file created in current directory)*
  - **Explanation:** Quick way to create files for editing or scripts.
- 

### 3. cp

- **Syntax:** `cp [source] [destination]`
  - **Description:** Copies files or directories.
  - **Example:** `cp file1.txt file1_copy.txt`
  - **Sample Output:**  
*(No output; file copied)*
  - **Explanation:** Used to duplicate files or backup important data.
- 

### 4. mv

- **Syntax:** `mv [source] [destination]`
  - **Description:** Moves or renames files/directories.
  - **Example:** `mv file1_copy.txt Archive/`
  - **Sample Output:**  
*(No output; file moved)*
  - **Explanation:** Useful for organizing files or renaming them.
-

## 5.rm

- **Syntax:** `rm [options] filename`
  - **Description:** Removes/deletes files or directories.
  - **Example:** `rm file2.txt`
  - **Sample Output:**  
*(No output; file deleted)*
  - **Explanation:** Used to clean up unnecessary files. Use `rm -r` for directories.
- 

## 6.cat

- **Syntax:** i. `cat > [file.txt]`  
ii. `cat file1.txt file2.txt > newfile.txt`  
iii. `cat file.txt`
- **Description:** Create files.
- **Example:** i. `cat file1.txt`  
ii. `cat file1.txt file2.txt > newfile.txt`  
iii. `cat newfile.txt`
- **Sample Output:**

```
taruna-tewatia@taruna-tewatia-VMware20-1:~$ cat > file1.txt
This is yhe content of file 1.
taruna-tewatia@taruna-tewatia-VMware20-1:~$ cat > file2.txt
This is the content of file 2.
taruna-tewatia@taruna-tewatia-VMware20-1:~$ cat file1.txt file2.txt > newfile.txt
taruna-tewatia@taruna-tewatia-VMware20-1:~$ cat newfile.txt
This is yhe content of file 1.
This is the content of file 2.
```

- **Explanation:** Used to open files, create files and catenate(combine) files.
- 

## 7.head

- **Syntax:** `head -n [filename]`
- **Description:** Displays first n lines of the mentioned file.
- **Example:** `head -n file1.txt`
- **Sample Output:**

```
taruna-tewatia@taruna-tewatia-VMware20-1:~$ head -10 states.txt
Haryana
Punjab
Uttarpradesh
Himachal pradesh
Uttarakhand
Gujrat
Rajasthan
West Bengal
Assam
Manipur
taruna-tewatia@taruna-tewatia-VMware20-1:~$
```

- **Explanation:** Useful for getting large files introduction with the help of starting lines without opening the whole file.

## 8. tail

- **Syntax:** `tail -n [filename]`
- **Description:** Displays large n lines of the mentioned file.
- **Example:** `rm file2.txt`
- **Sample Output:**

```
taruna-tewatia@taruna-tewatia-VMware20-1:~$ tail -10 states.txt
Telangana
Karnataka
Kerala
Tamil nadu
Goa
Meghalaya
Tripura
Bihar
Mizoram
Nagaland
taruna-tewatia@taruna-tewatia-VMware20-1:~$
```

- **Explanation:** Used to get last lines of a file without opening the whole file.
- 

## Permissions Management

### 9. chmod

- **Syntax:** `chmod [options] mode filename`
  - **Description:** Changes file or directory permissions.
  - **Example:** `chmod 755 script.sh`
  - **Sample Output:**  
*(No output; permissions updated)*
  - **Explanation:** Important for controlling who can read, write, or execute files.
- 

### 10. chown

- **Syntax:** `chown [owner][:group] filename`
  - **Description:** Changes file or directory owner and group.
  - **Example:** `chown user:user file1.txt`
  - **Sample Output:**  
*(No output; ownership changed)*
  - **Explanation:** Useful when managing multi-user environments.
-



# Script

Screenshot of create\_Career\_structure.sh file:

```
$ create_career_structure.sh
1  #Name: Kaushal
2  #Roll no: 2501730085
3  #Course: B.Tech CSE (AI & ML)
4  #Section: B
5
6
7  #!/bin/bash
8
9  # Script to automatically create a career or project folder structure
10
11  echo "Enter your project or career folder name:"
12  read folder
13
14  # Create main folder
15  mkdir -p "$folder"
16
17  # Subfolders
18  mkdir -p "$folder/Documents"
19  mkdir -p "$folder/Notes"
20  mkdir -p "$folder/Resources"
21  mkdir -p "$folder/Tasks"
22  mkdir -p "$folder/Screenshots"
23
24  # Starter files
25  echo "# $folder Project" > "$folder/README.md"
26  echo "Notes for $folder" > "$folder/Notes/notes.txt"
27  touch "$folder/Tasks/todo.txt"
28
29  # Display structure
30  echo
31  echo "Folder structure created successfully:"
32  tree "$folder" 2>/dev/null || ls -R "$folder"
```

## Screenshot of SCRIPT EXECUTION:

```
kaush@Kaushal MINGW64 ~/.vscode/Create_Career_Structure
$ nano create_career_structure.sh

kaush@Kaushal MINGW64 ~/.vscode/Create_Career_Structure
$ chmod +x create_career_structure.sh

kaush@Kaushal MINGW64 ~/.vscode/Create_Career_Structure
$ ./create_career_structure.sh
Enter your project or career folder name:
MyCareerProject

Folder structure created successfully:
MyCareerProject:
Documents  Notes  README.md  Resources  Screenshots  Tasks

MyCareerProject/Documents:

MyCareerProject/Notes:
notes.txt

MyCareerProject/Resources:

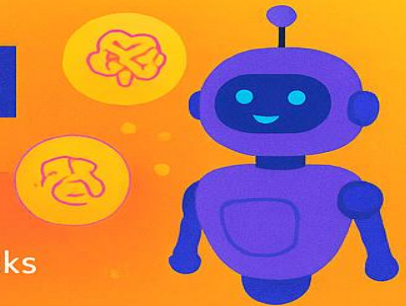
MyCareerProject/Screenshots:

MyCareerProject/Tasks:
todo.txt
```

# Exploring Emerging Technology Domain

## Artificial Intelligence

### AI DOMAIN



#### TECHNOLOGY OVERVIEW

AI is computer systems that perform tasks normally requiring human intelligence.

#### KEY CAPABILITIES

-  Machine Learning
-  Deep Learning
-  Natural Language Processing (NLP)
-  Computer Vision
-  Robotics
-  Expert Systems

#### APPLICATIONS

-  Google AI Fundamentals
-  IBM Applied AI Professional Certificate
-  Microsoft AI Fundamentals (AI-900)

#### CERTIFICATIONS RELATED TO AI

-  **Beginner**
  - Google AI Fundamentals
  - IBM Applied AI Professional Certificate
  - Microsoft AI Fundamentals

#### JOB ROLES & SALARY TRENDS (INDIA)

##### Entry-Level Roles (0-2 years)

- AI/ML Engineer ₹ 5-10 LPA
- Data Scientist ₹ 6-12 LPA
- Data Analyst ₹ 4-6 LPA
- NLP Engineer ₹ 6-12 LPA

##### Mid-Level Roles (3-6 years)

- Senior ML Engineer ₹ 12-22 LPA
- Computer Vision Engineer ₹ 10-20 LPA
- AI Research Engineer ₹ 12-25 LPA

##### Advanced/Leadership Roles

- AI Specialist / Lead AI Engineer ₹ 26-40+ LPA
- AI Architect ₹ 40-60+ LPA
- Head of AI / AI Director ₹ 60 LPA – ₹ 1 Cr+

#### ONE INDIAN STARTUP

##### Haptik (Mumbai)

**What they do:** One of India's leading Conversational AI platforms that builds AI chatbots for companies like Jio, Tata, and Ola

# Career Planning & Professional Readiness

## SMART Goals

### Short-term Goal (1–3 months):

**Goal:** Complete a Python Fundamentals course on Coursera and achieve at least 90% in all assessments by January 2026.

**Specific:** Learn Python basics including loops, functions, and data structures.

**Measurable:** Score  $\geq 90\%$  in quizzes and assignments.

**Achievable:** Allocate 1–2 hours daily to the course.

**Relevant:** Python is essential for data analysis and project development.

**Time-bound:** Complete within 3 months (by January 2026).

---

### Medium-term Goal (6–12 months) – ALREADY ACHIEVED

**Goal:** Build and deploy a personal portfolio website showcasing at least 3 projects by July 2026.

**Specific:** Use HTML, CSS, JavaScript, and GitHub Pages.

**Measurable:** Portfolio live online with 3 projects documented.

**Achievable:** Dedicate weekends to development and testing.

**Relevant:** A portfolio will strengthen my professional profile and LinkedIn visibility.

**Time-bound:** Launch the website within 6–12 months.

---

### Long-term Goal (1–3 years)

**Goal:** Secure an internship in a data analytics or software development company by 2027.

**Specific:** Apply to at least 30 internship opportunities and prepare with relevant projects and certifications.

**Measurable:** Get at least one internship offer.

**Achievable:** Leverage portfolio, certifications, and skills acquired from short/medium-term goals.

**Relevant:** Internship experience is crucial for career readiness and skill development.

**Time-bound:** Achieve by 2027.

## Certification Research

### Certification 1: AWS Cloud Practitioner

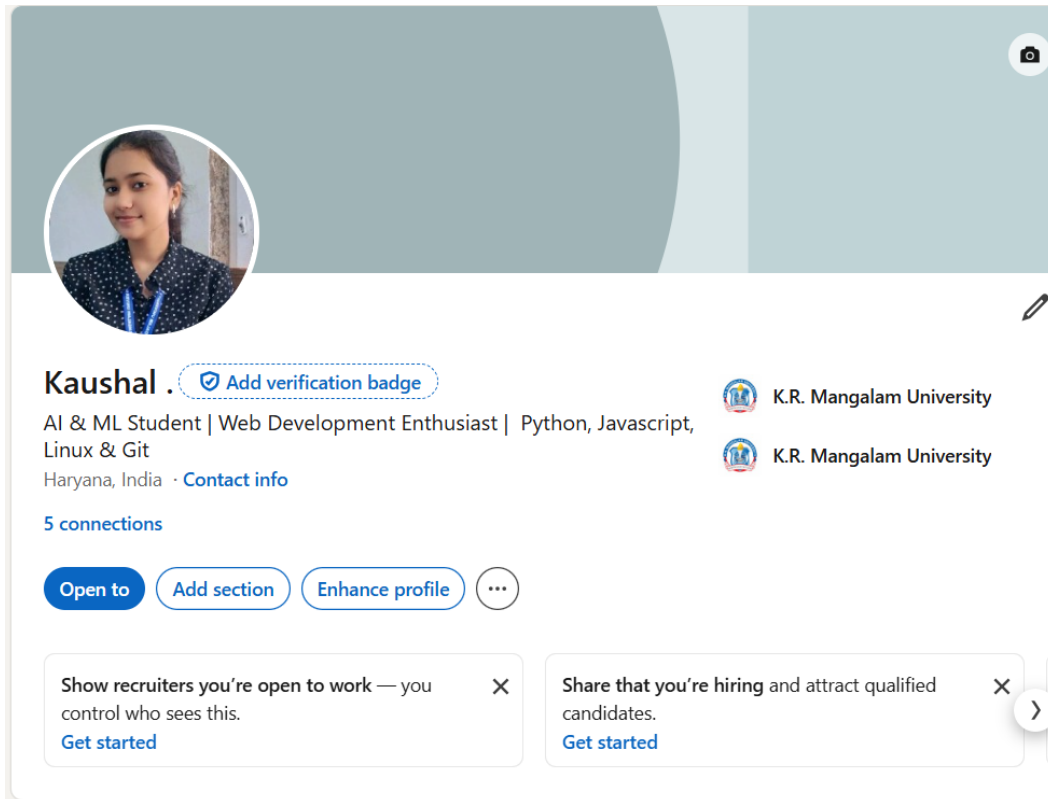
- **Provider:** Amazon Web Services (AWS)
  - **Duration & Cost:** Approx. 3 months, \$100 for exam
  - **Skills Covered:**
    - Cloud fundamentals
    - AWS services overview (EC2, S3, Lambda)
    - Basic cloud security and architecture
  - **Alignment with SMART Goals:**
    - Helps achieve my **long-term goal** of securing an internship in data analytics/software development by understanding cloud platforms used in real-world projects.
    - Enhances portfolio projects with cloud deployment skills.
-

## **Certification2: Google Data Analytics Professional Certificate**

- ***Provider:*** Coursera (Google)
- ***Duration & Cost:*** Approx. 6 months, \$39/month subscription
- ***Skills Covered:***
  - Data cleaning and visualization
  - SQL, spreadsheets, and R programming basics
  - Data-driven decision-making
- ***Alignment with SMART Goals:***
  - Supports **medium-term and long-term goals** by adding data analytics skills to my portfolio projects.
  - Makes me more competitive for internships in analytics or software development.

# LinkedIn Update

## Profile Picture & Headline



The image shows a LinkedIn profile header for a user named Kaushal. It includes a circular profile picture of a woman, a blue verification badge, and a headline. The background is a light blue gradient with a camera icon in the top right corner. Below the profile picture, there are buttons for 'Open to', 'Add section', 'Enhance profile', and a menu icon. There are also two cards for 'Show recruiters you're open to work' and 'Share that you're hiring'.

**Kaushal** [Add verification badge](#)

AI & ML Student | Web Development Enthusiast | Python, Javascript, Linux & Git  
Haryana, India · [Contact info](#)

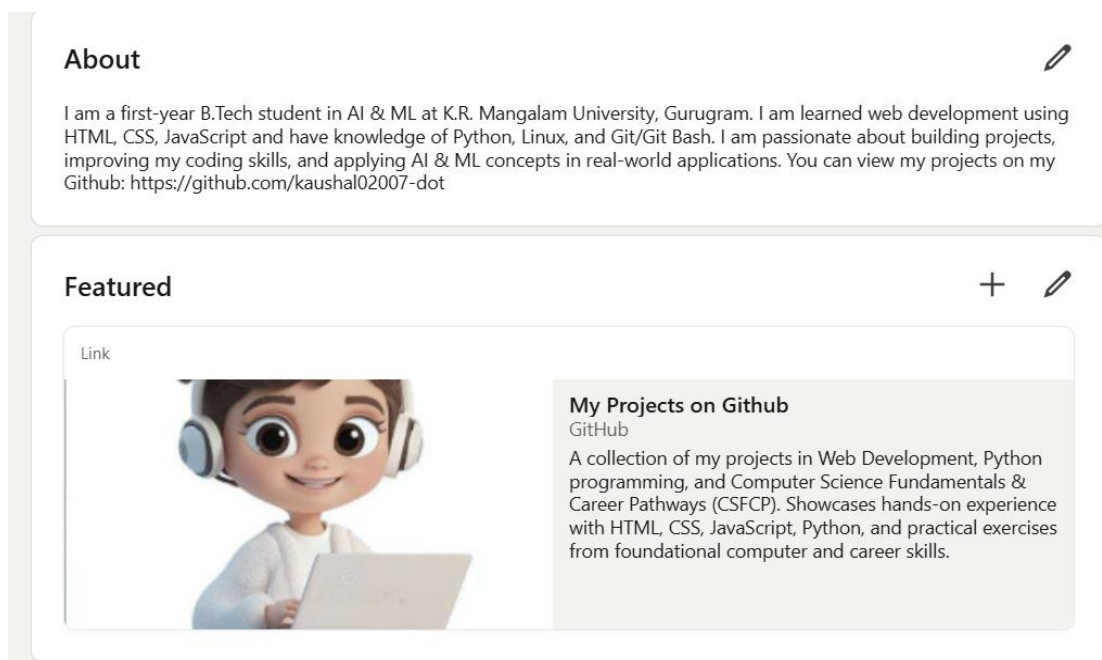
5 connections

[Open to](#) [Add section](#) [Enhance profile](#) [...](#)

Show recruiters you're open to work — you control who sees this. [Get started](#)

Share that you're hiring and attract qualified candidates. [Get started](#)

## Summary & About Section



The image shows the 'About' and 'Featured' sections of a LinkedIn profile. The 'About' section has a title 'About' and a paragraph of text. The 'Featured' section has a title 'Featured' and a card titled 'My Projects on Github' with a link to a GitHub repository. The card includes a cartoon image of a person wearing headphones and a laptop.

**About**

I am a first-year B.Tech student in AI & ML at K.R. Mangalam University, Gurugram. I am learned web development using HTML, CSS, JavaScript and have knowledge of Python, Linux, and Git/Git Bash. I am passionate about building projects, improving my coding skills, and applying AI & ML concepts in real-world applications. You can view my projects on my Github: <https://github.com/kaushal02007-dot>

**Featured**

Link

**My Projects on Github**  
GitHub

A collection of my projects in Web Development, Python programming, and Computer Science Fundamentals & Career Pathways (CSFCP). Showcases hands-on experience with HTML, CSS, JavaScript, Python, and practical exercises from foundational computer and career skills.

## Skills


← Skills


... +

All


Tools & Technologies


HTML5

 K.R. Mangalam University





Cascading Style Sheets (CSS)

 K.R. Mangalam University





JavaScript

 K.R. Mangalam University





Python (Programming Language)

 K.R. Mangalam University





Linux

 K.R. Mangalam University




Git/Git Bash


 K.R. Mangalam University




## Education



Experience

+ 

 **Student**  
K.R. Mangalam University

Education

+ 

 **K.R. Mangalam University**  
Bachelor's degree, Artificial Intelligence & Machine Learning  
Sep 2025 – Dec 2029  
  
Pursuing B.Tech in Artificial Intelligence & Machine Learning. Currently building strong foundations in web development (HTML, CSS, JavaScript), Python, Linux, and Git/Git Bash. Interested in AI, ML, and real-world project development.  
 **HTML5, Cascading Style Sheets (CSS) and +4 skills**

## LinkedIn Profile Link:

<https://www.linkedin.com/in/kaushal-71813b376/>



## Hackathon / Contest / Open Source Plan

**Event/Project Name:** CodeFest 2026 (Hackathon)

**Date:** January 15–17, 2026

**Platform/Organizer:** Hosted online by CodeFest Organization

### *Preparation Steps:*

1. Review and practice HTML, CSS, JavaScript for frontend tasks.
2. Brush up on Python for backend or logic challenges.
3. Learn basic Linux commands and Git/Git Bash for version control and collaboration.
4. Explore sample hackathon challenges and previous projects to understand expected outcomes.
5. Form a team or join online collaboration groups for project work.

### *Alignment with Goals:*

- Participating in hackathons will help achieve short-term and medium-term SMART goals by applying web development and programming skills in real-world problem-solving.
- It also strengthens your portfolio and resume, supporting your long-term goal of securing an internship in AI/ML or software development.

# Career Roadmap

As a first-year B.Tech student in Artificial Intelligence and Machine Learning at K.R. Mangalam University, Gurugram, I am focused on building a strong foundation in AI, ML, and web development. My career roadmap outlines a structured plan for skill development, certifications, projects, and internships over the next three years to achieve professional readiness.

## ***Year 1: Building Foundations***

The first year is dedicated to establishing technical skills. I have learned web development using HTML, CSS, and JavaScript and gained knowledge of Python, Linux, and Git/Git Bash. These skills provide a foundation for building projects and understanding AI/ML basics.

### **Key milestones:**

- Build and host small web development projects on GitHub.
- Learn introductory AI and ML concepts such as data handling, algorithms, and basic model building.
- Update LinkedIn with a professional summary, skills, education, and GitHub portfolio.
- Participate in beginner-level coding contests or hackathons for practical exposure.

By the end of Year 1, I aim to have a portfolio of projects and a clear understanding of foundational AI and web development concepts.

---

## ***Year 2: Skill Enhancement and Certifications***

The second year will focus on strengthening technical expertise and gaining certifications. I plan to pursue **AWS Cloud Practitioner** and **Google Data Analytics Professional Certificate** to enhance knowledge of cloud computing, data analysis, and workflow management.

### **Key milestones:**

- Develop intermediate projects integrating Python, web development, and data analysis.
- Gain experience in Git/Git Bash for version control and collaborative coding.
- Contribute to open-source projects on GitHub.
- Participate in national-level hackathons or coding competitions.
- Apply for online internships or small projects in AI, ML, or web development.

By the end of Year 2, I aim to have a strong portfolio, hands-on experience, and certification credentials to showcase practical skills.

---

### ***Year 3: Professional Exposure and Specialization***

The third year focuses on advanced learning and professional exposure. I plan to work on larger AI/ML projects, participate in hackathons, and secure internships to gain industry-level experience.

#### **Key milestones:**

- Build advanced projects integrating AI/ML models with web applications.
- Contribute to and potentially lead open-source projects.
- Attend workshops or online courses on advanced AI/ML topics like neural networks, NLP, or computer vision.
- Apply for internships in AI/ML, data analytics, or web development roles.

By the end of Year 3, I aim to be professionally prepared with a strong portfolio, certifications, and practical experience.

---

### ***Long-Term Vision***

Beyond Year 3, my goal is to pursue a career as an AI/ML engineer, contributing to real-world AI applications and web-based solutions. Continuous learning, open-source contributions, and advanced certifications will ensure I stay updated with emerging technologies and industry standards.

## Reflection

Completing this assignment was a valuable learning experience that allowed me to integrate technical skills, professional development, and career planning. One of the main challenges I faced was designing and implementing the Bash script to automate a career-related task. Ensuring correct file permissions, understanding Linux commands, and executing the script successfully required attention to detail and patience. Creating an algorithm and flowchart for a career-related system also demanded careful thinking to translate logical steps into a visual representation.

Updating my LinkedIn profile and researching relevant certifications were other challenging yet rewarding tasks. Crafting a concise summary, highlighting skills, and organizing my projects on GitHub helped me understand the importance of a professional online presence. Planning for a hackathon and drafting a career roadmap required strategic thinking to align my short-term and long-term goals with industry requirements.

Through this assignment, I improved my *technical skills* in Linux, Bash scripting, Git, and project organization. I also enhanced my *professional skills*, including career planning, certification research, and portfolio management. Additionally, I developed critical *problem-solving and planning abilities* by designing algorithms, flowcharts, and roadmaps.

This experience will help me academically by providing a structured approach to learning and project execution, and professionally by preparing me to present my skills effectively, participate in technical events, and pursue a clear path toward a career in AI, ML, and web development.

## Github Assignment 5 Link:

<https://github.com/kaushal02007-dot/KRMU-CSFCP-Assignments/tree/1eed97ffd40b3a00df8814338b957939e7631a8/Assignment%205>