K.R. MANGALAM UNIVERSITY **School of Engineering & Technology**

Department: SOET

Programme: B.Tech CSE (Specialization in AI & Machine Learning)

Course Code: ETCCCP105

Course Name: Computer Science Fundamentals & Career Pathways

Assignment Number 05: Career Planning, Certifications & Industry Readiness
Assignment Title: Design Your Career Roadmap with SMART Goals

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1. Problem Definition

Topic: Resume Keyword Analyzer

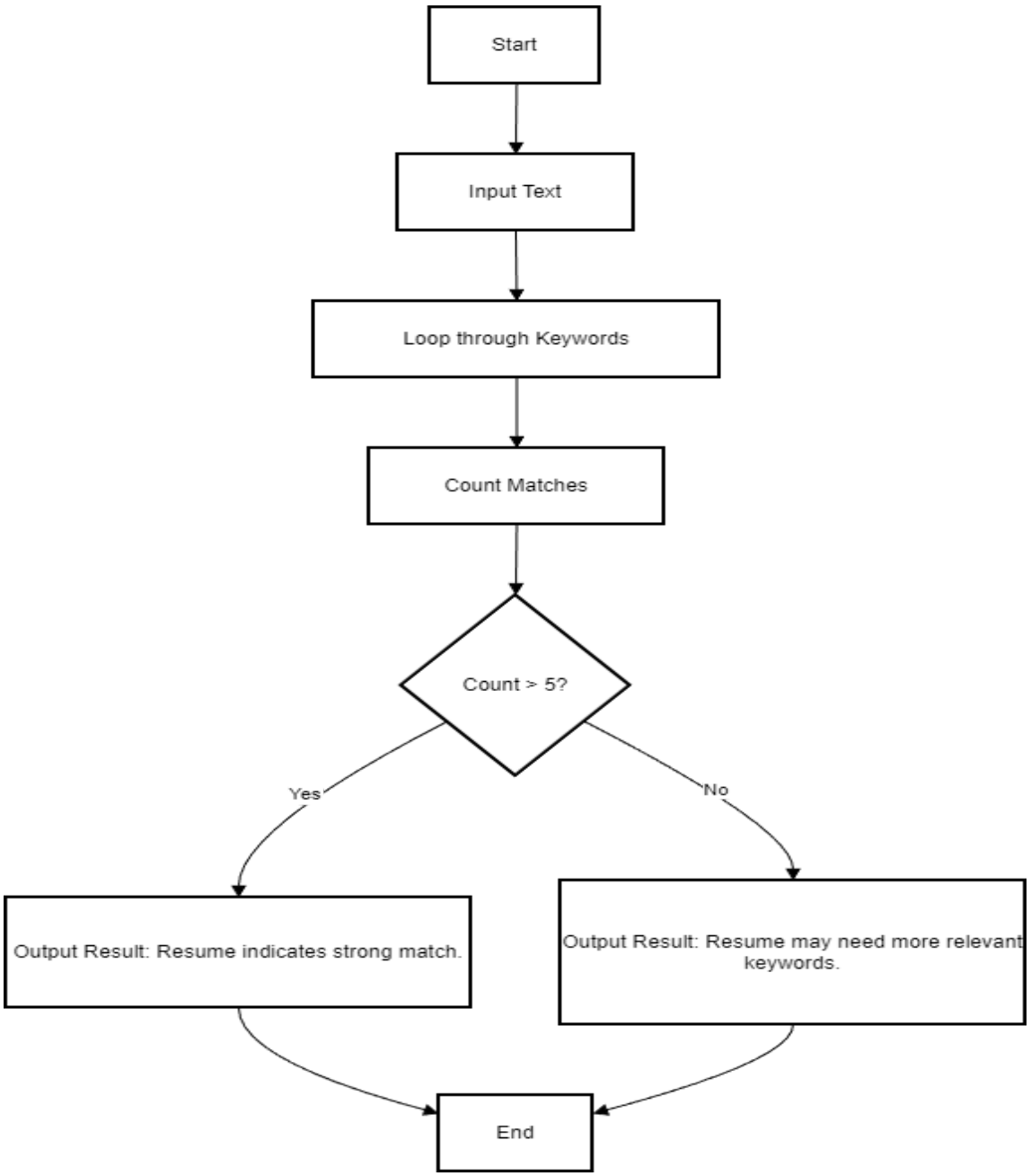
Objective: To automate the process of screening resumes by counting specific industry-relevant keywords (e.g., "Python", "Machine Learning", "C++"). This tool helps in identifying how well a resume aligns with a specific job description.

A) Algorithm (Pseudocode)

```
START
  DEFINE list of target_keywords = ["Python", "C++", "AI", "Machine Learning", "React"]
  INITIALIZE keyword_counts as an empty dictionary (or map)

  INPUT resume_text (string)
  CONVERT resume_text to lowercase to ensure case-insensitivity

  FOR EACH keyword in target_keywords:
    SET current_count = 0
    SEARCH for keyword in resume_text
    COUNT occurrences of keyword
    STORE count in keyword_counts
  END FOR
```

```
  DISPLAY "Keyword Analysis Report:"
  FOR EACH item in keyword_counts:
    PRINT item key AND item value

 IF total_matches > 5 THEN
    PRINT "Resume indicates strong match."
  ELSE
    PRINT "Resume may need more relevant keywords."
  END IF
STOP
```

B) Design (Flowchart)



2. Bash Script for Automation Purpose: Automating the creation of a standard folder structure for new AI/ML projects.

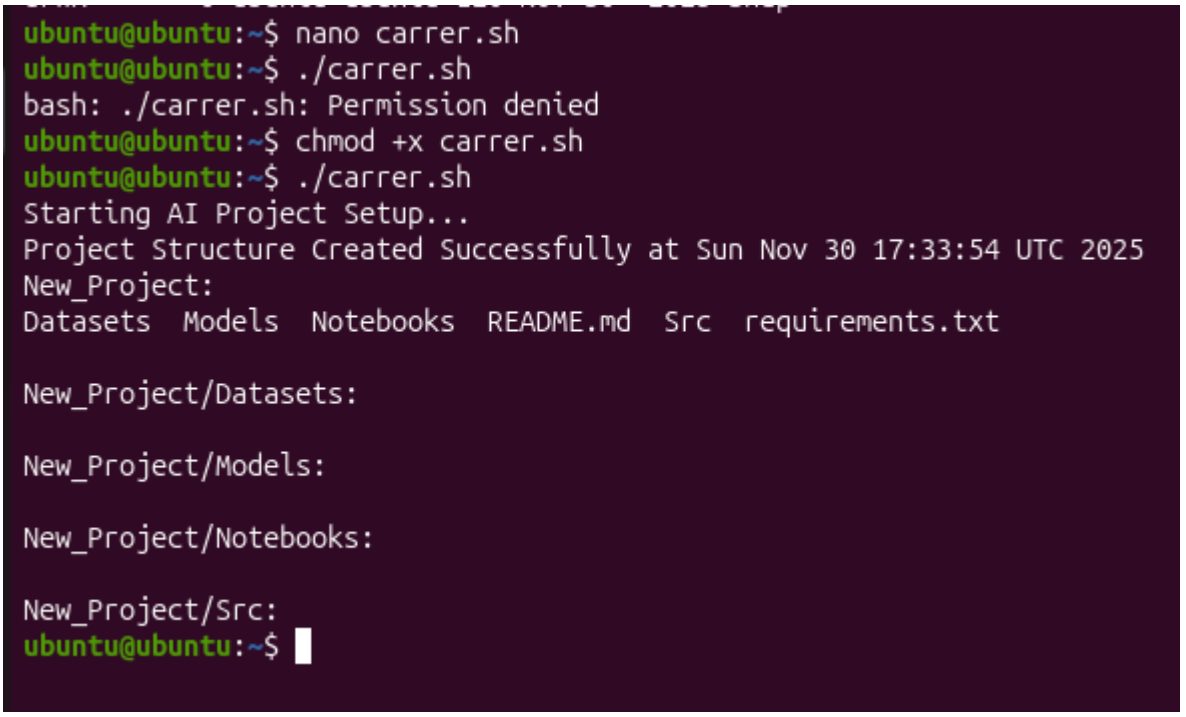
1. Key Linux Commands (File Management)

1. `mkdir Career_Assignment` (Creates directory)
2. `cd Career_Assignment` (Changes directory)
3. `touch resume_draft.txt` (Creates file)
4. `ls -l` (Lists files with permissions)
5. `cp resume_draft.txt backup_resume.txt` (Copies file)
6. `mv backup_resume.txt old_resume.txt` (Renames/Moves file)
7. `echo "Pulkit Pradhan" > header.txt` (Writes to file)
8. `cat header.txt` (Displays file content)
9. `chmod 755 script.sh` (Changes permissions)
10. `rm old_resume.txt` (Deletes file)

```
ubuntu@ubuntu:~$ mkdir Career_Assignment
ubuntu@ubuntu:~$ ls
Career_Assignment  Documents  Music        Pictures  Templates  snap
Desktop            Downloads  New_Project  Public    Videos
ubuntu@ubuntu:~$ cd Career_Assignment
ubuntu@ubuntu:~/Career_Assignment$ touch resume_draft.txt
ubuntu@ubuntu:~/Career_Assignment$ ls -l
total 0
-rw-rw-r-- 1 ubuntu ubuntu 0 Nov 30 17:28 resume_draft.txt
ubuntu@ubuntu:~/Career_Assignment$ cp resume_draft.txt backup_resume.txt
ubuntu@ubuntu:~/Career_Assignment$ mv backup_resume.txt old_resume.txt
ubuntu@ubuntu:~/Career_Assignment$ echo "Pulkit Pradhan" > header.txt
ubuntu@ubuntu:~/Career_Assignment$ cat header.txt
Pulkit Pradhan
ubuntu@ubuntu:~/Career_Assignment$ chmod 755 script.sh
chmod: cannot access 'script.sh': No such file or directory
ubuntu@ubuntu:~/Career_Assignment$ rm old_resume.txt
ubuntu@ubuntu:~/Career_Assignment$ cd ..
ubuntu@ubuntu:~$ chmod 755 script.sh
chmod: cannot access 'script.sh': No such file or directory
ubuntu@ubuntu:~$
```

2. Script Content (`setup_project.sh`):

```
#!/bin/bash
echo "Starting AI Project Setup..."
mkdir -p New_Project/{Datasets,Models,Notebooks,Src}
touch New_Project/README.md
touch New_Project/requirements.txt
echo "Project Structure Created Successfully at $(date)"
ls -R New_Project
```



3 - Emerging Technology Infographic]

Domain: Artificial Intelligence (AI) & Machine Learning

Infographic Content Data:

- **Overview:** AI simulates human intelligence in machines. ML allows systems to learn from data without explicit programming.
- **Key Roles:** Machine Learning Engineer, Data Scientist, AI Research Scientist, Computer Vision Engineer.
- **Salary Trends:** Entry Level: ₹6–10 LPA | Mid-Level: ₹15–25 LPA | Senior: ₹30 LPA+ (Source: Glassdoor/LinkedIn).
- **Certifications:** TensorFlow Developer Certificate, AWS Certified Machine Learning - Specialty.
- **Indian Startup Example: Krutrim** (India's first AI unicorn, focused on building full-stack AI capabilities).

4 - Career Planning & Professional Readiness

1. SMART Goals :-

- **Short-term** (0-6 Months):

1. Goal: Data Structures & Algorithms mastery with Python.
Measurement: Getting over 150 problems solved on LeetCode/HackerRank at the end of Semester
2. Relevance: A big plus on the way to internship interviews.

- **Medium-term** (6-18 Months):

1. Goal: Creating a working gesture-controlled robot with ESP32.
Measurement: The prototype is ready and it is displayed in a college technical festival or hackathon by Year
2. Relevance: My interest in AI , Machine learning and C++ skills will be realized through an applied project.

- **Long-term** (Graduation):

1. Goal: The role of an AI Engineer specialist.
Measurement: A job offer with a package of more than ₹12 LPA in an AI-focused firm (like Google, Microsoft, or AI startups) is yours.
2. Relevance: It coincides with my B.Tech specialization.

2. Certification Research:-

1: TensorFlow Developer Certificate
Provider: Google (via Coursera/Prometric).
Details: Building/training models with TensorFlow is the main focus.
Alignment: A certificate that proves the practical knowledge in Deep Learning, which is indirectly supporting my goal of becoming an AI Engineer.
Certification

2: AWS Certified Machine Learning – Specialty
Provider: Amazon Web Services (AWS).
Details: ML implementation on the cloud is the main focus. The duration for preparation is about 2-3 months.
Alignment: To deploy AI models, cloud computing skills are a necessity for the models I plan to build.

3. LinkedIn Update : -
Headline: B.Tech CSE Student (AI & Machine learing) | Python | C++ | Aspiring AI Engineer

Skills Added: Python, C++, Artificial Intelligence, Data Structures, React.

4. Hackathon/Contest Plan:-

- **Event Name:** Smart India Hackathon (SIH) Internal Round.
- **Date:** Tentatively August-September (Next Cycle).
- **Plan:** I have formed a team of 4. We are brainstorming ideas around "AI for Healthcare." I have registered on the SIH portal and am currently learning OpenCV for the project.

5. Career Roadmap (Year-wise Plan):-

Year 1: Foundation & Exploration My main goal is to get a hold of the programming languages' syntax and logic thoroughly. Right now, I'm in the process of learning Python and C++. So by the end of this year, I want to do the "GradeBook Analyzer" mini-project to gain more confidence in my coding skills. Moreover, I will try to concentrate on high CGPA so as to be eligible for top companies.

Year 2: Core Skills & Projects I will dig even deeper into DSA, as this is the trigger for technical interviews. I will enroll in the certification course Machine Learning (Andrew Ng's) and keep practicing Data Science. Also, in my free time, I will create hardware projects, such as modifying my gesture-controlled bot, in order to blend my programming skills with robotics.

Year 3: Specialization & Internships This is the year for hands-on experience. I would like to receive a certificate as a Data Science or Python Developer intern. My projects will be visible on GitHub, and I'll thus build a portfolio. I also have a plan to pass the TensorFlow certification exam this year.

Year 4: Capstone & Placement I will majorly concentrate on a big Capstone project which would be a tough AI model (possibly a "working model of an artificial mind"). I want to be ready for placement by August, mainly through mock interviews and system design.

Github link:- [PulkitPradhan/CSF-CAPSTONE-UNIT-5-ASSIGNMENT]

Reflection:-

This assignment was a wonderful opportunity to take stock of my performance and gauge where I need to improve. The hardest part for me was to come up with the "SMART" metrics for my goals; it is straightforward to have a general wish, but it is difficult to establish a deadline that can be measured. One area where I made considerable progress and was very pleased with myself was Linux file permissions, which I had earlier found very difficult to understand. The search for certifications also made it clear to me what I should study that is not covered in my college curriculum. I will use the logic of bash scripting to set up my future coding assignments in a way that I will not have to spend time on the setup process.