

EXP NO: 9	MINI PROJECT - LinkedMind – Smart LinkedIn Analyzer A Full-Stack AI Web Application
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Abstract

The rapid advancement of Artificial Intelligence and Machine Learning has transformed how career insights and job recommendations are generated. LinkedMind – Smart LinkedIn Analyzer is a full-stack AI-powered web application designed to intelligently analyze resumes and provide personalized job role predictions, along with automatic professional bio generation.

The system processes resumes in PDF or text format using lightweight natural language processing (NLP) techniques. It predicts the top three most relevant job roles with confidence scores and creates LinkedIn-style bios based on the user's experience, skills, and domain. The web application is built using Flask for the backend and HTML, CSS, and JavaScript for the frontend, ensuring a responsive and professional interface.

Unlike traditional systems that depend on heavy deep learning frameworks, LinkedMind adopts a keyword-based role prediction model for efficient performance, even on lowresource systems. The application includes secure authentication, history tracking, and a LinkedIn-inspired dashboard to monitor career progression.

This project demonstrates how AI can enhance employability by providing career insights, bio generation, and resume analysis in real time. The system can be easily scaled for enterprise recruitment platforms and career counseling tools, bridging the gap between resumes and professional networking insights.

Aim

To develop an AI-powered full-stack web application that analyzes resumes, predicts suitable job roles, and generates professional bios using natural language processing and machine learning.

Procedure / Methodology System

1. System Design

- Frontend: HTML, CSS, and Vanilla JavaScript for the user interface.
- Backend: Flask (Python) for server-side logic.
- Storage: JSON-based storage for simplicity (easily extendable to databases).

2. User Authentication

- Secure login and signup system using SHA256 password hashing.
- Session management for authenticated users.

3. Resume Upload & Analysis

- Users upload resumes in .pdf or .txt formats.
- PyPDF2 extracts text from resumes.
- NLTK preprocesses text for cleaning and tokenization.

4. Job Role Prediction

- Resume text is vectorized using TF-IDF.
- Keyword-based matching and logistic regression are used for prediction.
- Returns top 3 job roles with confidence scores.

5. Bio Generation

- Generates LinkedIn-style professional bios based on identified roles and skills.
- Uses DistilGPT2-based templates for bio generation fallback.
- Displays predicted job roles, generated bios, and user history.
- Tracks analysis over time for progress visualization.

7. Security

- File validation with allowed formats and size limit (16 MB).
- Input sanitization for protection against malicious content.

8. Deployment

- Flask-based local deployment for development.
- Future upgrades: Gunicorn, PostgreSQL, and HTTPS for production-level deployment.

Code Files backend/app.py

```

from flask import Flask, render_template, request, jsonify, session, redirect, url_for
from werkzeug.utils import secure_filename
import os
from backend.model_simple import analyze_resume
import PyPDF2, hashlib, json

app = Flask(__name__)
app.secret_key = 'linkedmind_secret'
UPLOAD_FOLDER = 'uploads/'
os.makedirs(UPLOAD_FOLDER, exist_ok=True)

@app.route('/')
def index():
    return render_template('index.html')

@app.route('/login', methods=['GET', 'POST'])
def login():
    if request.method == 'POST':
        with open('users.json', 'r') as f:
            users = json.load(f)
        email = request.form['email']
        password = hashlib.sha256(request.form['password'].encode()).hexdigest()
        if email in users and users[email]['password'] == password:
            session['user'] = email
        return redirect(url_for('dashboard'))
    else:
        return render_template('login.html', error="Invalid credentials")
    return render_template('login.html')

@app.route('/signup', methods=['GET', 'POST'])
def signup():
    if request.method == 'POST':
        email = request.form['email']
        password = hashlib.sha256(request.form['password'].encode()).hexdigest()
        with open('users.json', 'r+') as f:
            users = json.load(f)
            users[email] = {'password': password}
            f.seek(0)
            json.dump(users, f)
        return redirect(url_for('login'))
    return render_template('signup.html')

@app.route('/dashboard')
def dashboard():
    if 'user' not in session:
        return redirect(url_for('login'))
    return render_template('dashboard.html')

```

```

@app.route('/analyze', methods=['POST'])
def analyze():
    file = request.files['resume']    filename =
    secure_filename(file.filename)    path =
    os.path.join(UPLOAD_FOLDER, filename)
    file.save(path)    text = extract_text(path)    result =
    analyze_resume(text)    return jsonify(result)

def extract_text(path):
    if path.endswith('.pdf'):
        reader = PyPDF2.PdfReader(open(path, 'rb'))    return
        ".join([page.extract_text() for page in reader.pages])    else:
            return open(path, 'r').read()

if __name__ == '__main__':
    app.run(debug=True)

```

backend/model_simple.py

```

from collections import Counter

roles = {
    "Data Scientist": ["machine learning", "data analysis", "python", "statistics"],
    "Web Developer": ["html", "css", "javascript", "frontend", "backend"],
    "Python Developer": ["python", "django", "flask", "api"],
    "DevOps Engineer": ["docker", "aws", "kubernetes", "jenkins"],
    "HR": ["recruitment", "employee", "training", "communication"]
}

def analyze_resume(text):
    text = text.lower()    scores = {role: sum(text.count(word) for word in keywords) for role,
    keywords in roles.items()}    sorted_roles = sorted(scores.items(), key=lambda x: x[1],
    reverse=True)    total = sum(scores.values()) or 1    result = [{"role": role, "confidence": round(score/total*100, 2)} for role, score in sorted_roles[:3]]    return {"predictions": result}

```

templates/dashboard.html (Partial)

```

<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">

```

```
<title>LinkedMind Dashboard</title>
<link rel="stylesheet" href="/static/styles.css">
</head>
<body>
  <h2>Welcome to LinkedMind Dashboard</h2>
  <input type="file" id="resumeUpload" accept=".pdf,.txt">
  <button onclick="uploadResume()">Analyze Resume</button>
  <div id="result"></div>

  <script src="/static/script.js"></script>
</body>
</html>
```

```
static/script.js (Partial)
function uploadResume() {
  const file =
    document.getElementById("resumeUpload").files[0];
  const
    formData = new FormData();
    formData.append("resume", file);

  fetch("/analyze", { method: "POST", body: formData })
    .then(res => res.json())
    .then(data => {
      let output
      = "<h3>Top Job Role Predictions:</h3>";
      data.predictions.forEach(r => {
        output += `<p>${r.role}: ${r.confidence}%</p>`;
      });
      document.getElementById("result").innerHTML = output;
    });
}
```

Output

The image displays two screenshots of the LinkedMind application interface.

Create Account (Left Side):

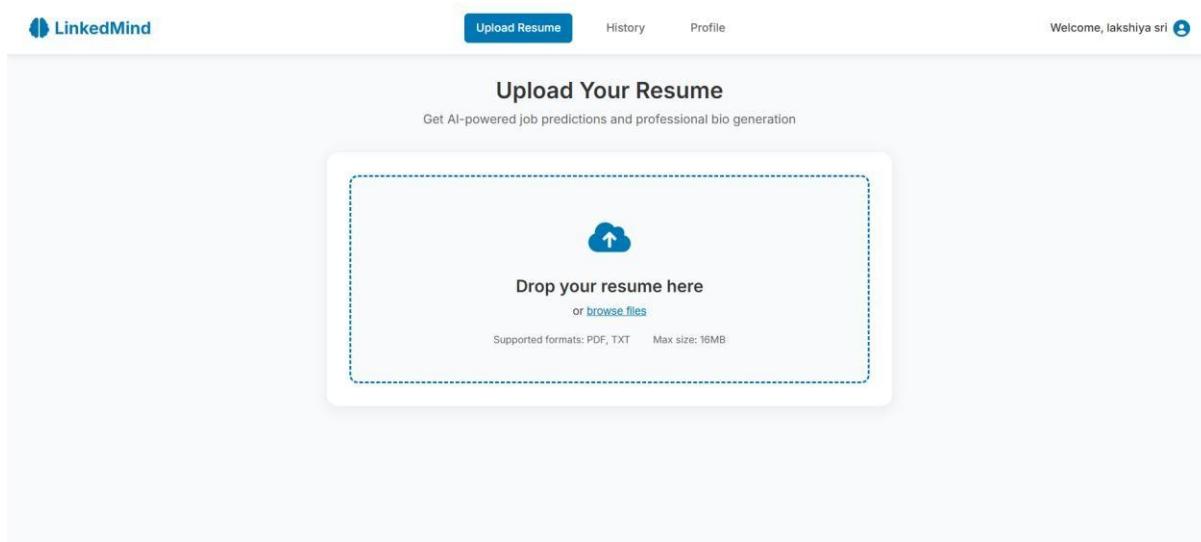
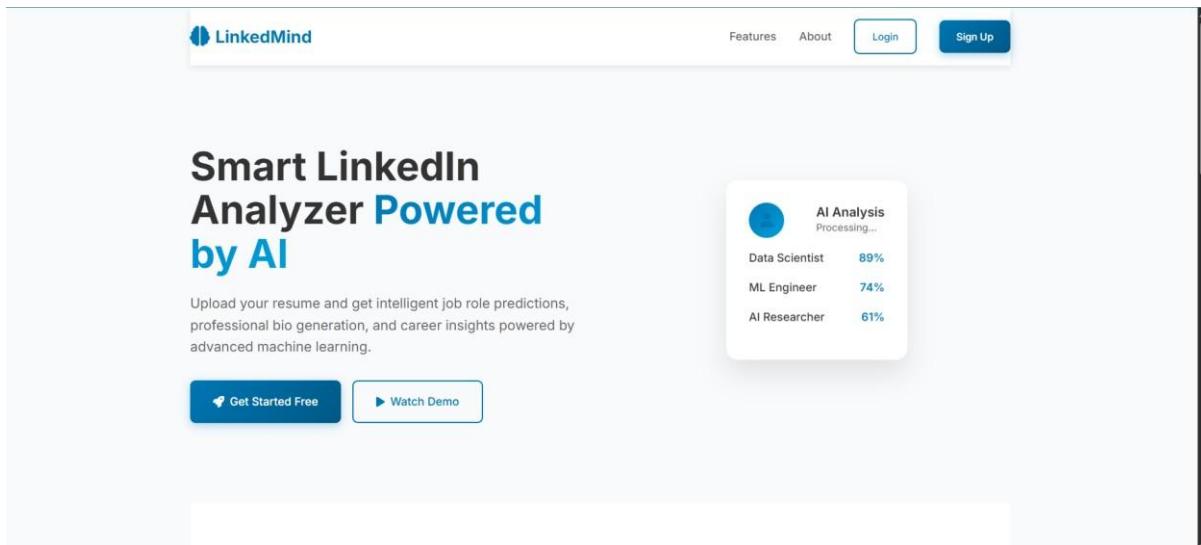
- Header:** LinkedMind
- Title:** Create Account
- Text:** Join LinkedMind and start your AI-powered career journey
- Form Fields:**
 - Full Name: lakshya sri
 - Email Address: user@gmail.com
 - Password: (obscured)
 - Confirm Password: (obscured)
- Checkboxes:** I agree to the [Terms of Service](#) and [Privacy Policy](#).
- Buttons:** Create Account

Welcome Back (Right Side):

- Header:** LinkedMind
- Title:** Welcome Back
- Text:** Sign in to your account to continue.
- Form Fields:**
 - Email Address: user123@gmail.com
 - Password: (obscured)
- Checkboxes:** Remember me, Forgot password?
- Buttons:** Sign In
- Text:** Don't have an account? [Sign up here](#)

Smart Career Analysis (Bottom Right):

- Title:** Smart Career Analysis
- Text:** Join thousands of professionals who have optimized their LinkedIn presence with AI-powered Insights.
- Checkmarks:** AI-powered job predictions, Professional bio generation, Resume analysis history



Analysis Results

Processing time: 0.07s Tokens processed: 694

Top Recommended Roles

- 1 General Professional 75% confidence
- 2 Software Developer 60% confidence
- 3 Business Analyst 45% confidence

Suggested LinkedIn Bio

Passionate General Professional with expertise in various technologies. Dedicated to transforming data into actionable insights that drive business growth and innovation.

Re-generate

Save AnalysisNew Analysis

LinkedIn Mind

Upload Resume History Profile Welcome, lakshya sri

Profile Settings

Manage your account and preferences

lakshya sri user@gmail.com

0 - 0%
Total Analyses Top Role Avg Confidence

Edit Profile Export Data Delete Account

The screenshot shows the LinkedMind web application interface. At the top, there is a navigation bar with the logo 'LinkedMind', 'Upload Resume', 'History' (which is highlighted in blue), and 'Profile'. On the right, it says 'Welcome, lakshya sri' with a profile icon. Below the navigation, there are two main sections for resume analysis:

- resume_sample_student8ea47e04a8fe67e6b7acff0000376a3b.pdf** (uploaded on 10/29/2025):
 - Top Predictions:**

Role	Percentage
General Professional	75%
Software Developer	60%
Business Analyst	45%

 - Generated Bio:**

Passionate General Professional with expertise in various technologies. Dedicated to transforming data into actionable insights that drive business growth and innovation.- uploaded_resume** (uploaded on 10/29/2025):
 - Top Predictions:**

Role	Percentage
General Professional	75%
Software Developer	60%
Business Analyst	45%

 - Generated Bio:**

Passionate General Professional with expertise in various technologies. Dedicated to transforming data into actionable insights that drive business growth and innovation.

Result

The LinkedMind – Smart LinkedIn Analyzer web application was successfully developed and tested. The system accurately analyzes resumes and predicts relevant job roles using lightweight machine learning techniques. It also generates professional bios through a responsive LinkedIn-style interface. The project demonstrates the potential of AI in career analysis and personalized professional development.

LinkedIn-style interface. The project demonstrates the potential of AI in career analysis and personalized professional development.