Roadmap for AI-Powered Loan Eligibility Advisor Bot

Phase 1 – Planning & Design

1. **Define Scope & Features**
    - Loan types: Home, Personal, Education, Vehicle.
    - Core functions: Eligibility check, EMI calculator, Loan recommendation.
    - Optional: Document upload with OCR, integration with credit bureaus.
2. **Tech Stack Decision**
    - **Frontend (Chatbot UI):** React.js, Vue.js, or simple web UI with chat interface (or integrate into WhatsApp/Telegram using APIs).
    - **Backend:** Node.js/Express OR Python (Flask/FastAPI).
    - **Database:** MongoDB / PostgreSQL / MySQL (store user data, chat history, loan offers).
    - **AI/ML:** Python (Scikit-learn, TensorFlow, or PyTorch).
    - **Integrations:** CIBIL/Experian APIs, Bank Loan APIs, Document OCR (Google Vision/Tesseract).

Phase 2 – Chatbot & User Interaction

1. Build chatbot UI (simple chat interface).
2. Implement conversation flow:
    - Greeting → Collect details → Ask loan preferences → Confirm data.
3. Store conversation state in DB so user doesn't need to repeat.

Phase 3 – Data Collection & Preprocessing

1. **User Input Form** (Name, Age, Income, Loan Amount, etc.).
2. **Validation & Cleaning:**
    - Check mandatory fields.
    - Normalize income (monthly vs yearly).
    - Convert text to numeric (e.g., "30k" → 30000).
3. **Feature Engineering:**
    - Calculate **DTI (Debt-to-Income Ratio)**.
    - Categorize employment type.
    - Normalize credit score range.

Phase 4 – ML Model Development

1. **Dataset Preparation**

- Collect/sample loan approval datasets (can use Kaggle datasets for training).
- Features: Age, Salary, Loan Amount, Tenure, Credit Score, EMIs.
- Labels: Approved / Rejected, Approved Amount, Risk Category.

2. **Model Training**
   - Use classification model (Logistic Regression, Random Forest, XGBoost).
   - Output:
     - Approval Probability (High / Medium / Low).
     - Eligible Loan Amount & Tenure Range.
3. **Save Model** using pickle/joblib for deployment.

Phase 5 – Decision & Recommendation Engine

1. If **Eligible**:
   - Show loan offers from banks (static dataset first, later integrate APIs).
   - Suggest EMI plans (use EMI formula).
   - Show repayment schedule preview.
2. If **Not Eligible**:
   - Explain reason (low income, poor credit score, high liabilities).
   - Suggest improvements.

Phase 6 – Document Verification (Optional Advanced)

1. Implement **OCR** (Tesseract or Google Vision API).
   - Extract details from Aadhaar, PAN, Salary Slip.
2. Cross-check extracted values with user input.

Phase 7 – Deployment

1. **Backend + ML Model Deployment**
   - Host model API on Flask/FastAPI + Gunicorn + Nginx.
   - Or use **Docker** for containerized deployment.
   - Cloud: AWS, Azure, GCP, or Render/Heroku (for MVP).
2. **Frontend Deployment**
   - Deploy chatbot UI on Vercel/Netlify.
   - Connect with backend API.

Phase 8 – Enhancements

- Integrate **bank APIs** for real loan offers.

- Add **voice interaction** (Dialogflow / Rasa).
- Add **multi-language support** (for Indian regional languages).
- Improve ML model with user feedback loop (continuous learning).

📅 Suggested Timeline

- **Week 1–2:** Design chatbot flow + setup backend & DB.
- **Week 3–4:** Data preprocessing + basic ML model training.
- **Week 5:** Integrate ML model with chatbot.
- **Week 6:** Add recommendation engine + EMI calculator.
- **Week 7–8:** Deployment & testing.
- **Later:** OCR, credit bureau API, real bank integrations.