Personalized Roadmap: AI-Powered Loan Eligibility Advisor

This roadmap is tailored for building an AI-Powered Loan Eligibility Advisor system. It outlines the steps you should follow, including data preparation, model training, application development, and deployment. The plan avoids cloud dependencies (as you mentioned using Supabase and offline servers) and focuses on practical, step-by-step progress.

# Phase 1: Requirements & Planning

- Define eligibility criteria (credit score thresholds, debt-to-income ratio, income minimums).  
- Decide supported document types (PAN, Aadhaar, salary slips, bank statements).  
- Plan database schema in Supabase for users, documents, and loan applications.  
- Ensure compliance with Indian financial data policies.

# Phase 2: Data Preparation

- Collect or generate datasets with features such as income, loan amount, credit score, etc.  
- Implement OCR pipeline (Tesseract locally) for PAN, Aadhaar, salary slips, and bank statements.  
- Clean and normalize extracted data before storing in Supabase.  
- Create rules for calculating financial ratios (Debt-to-Income, Loan-to-Income).

# Phase 3: Model Development

- Train supervised ML models (Logistic Regression, Random Forest, XGBoost).  
- Build an ensemble (stacking) for improved accuracy.  
- Evaluate models with Accuracy, Precision, Recall, F1, ROC-AUC.  
- Use SHAP values for explainability (showing factor contributions).

# Phase 4: Backend Development

- Build REST APIs with FastAPI/Django to:  
 • Handle user registration and document upload.  
 • Parse OCR outputs and save structured data to Supabase.  
 • Run loan eligibility prediction and return results.  
- Implement PDF report generator for each application.

# Phase 5: Frontend Development

- Use Streamlit for web-based UI.  
- Features:  
 • Form input for financial details.  
 • Upload section for identity and financial documents.  
 • Chatbot window for financial Q&A (basic NLP with transformer model).  
 • Results dashboard with prediction, SHAP visualization, and PDF download.

# Phase 6: Deployment & Testing

- Deploy backend on local/offline server with Supabase connection.  
- Containerize app with Docker if portability is needed.  
- Test the system with real/synthetic applications to ensure consistency.  
- Optimize inference speed for real-time responses.

# Phase 7: Security & Compliance

- Encrypt sensitive user data before storage.  
- Use role-based access in Supabase for security.  
- Ensure Aadhaar/PAN data is masked in reports (show partial values).

# Phase 8: Continuous Improvements

- Periodically retrain models with new loan applications.  
- Expand chatbot knowledge with more financial FAQs.  
- Add fraud detection checks for tampered salary slips or fake bank statements.  
- Provide multi-language support for better accessibility.