**Outfit Suggestion Mobile App: Solution Document**

### **Summary**

This document outlines a robust and scalable approach to developing an outfit suggestion mobile app.The proposed solution ensures seamless wardrobe management, weather-adapted suggestions, and an engaging user experience.

**Development:-**

**1. Frontend Development(key features):**

**-Authentication Screens**

* **Registration:**
  + **User registration with Email/Google/Apple options.**
  + **Login and Forgot Password flows.**
* **Implementation Tools:**
  + **Firebase Auth for seamless integration with backend APIs.**

**-Wardrobe Management**

* **Upload Items:**
  + **Allow users to upload wardrobe item images using camera/gallery.**
  + **Preview uploaded images with tags (type, season, color).**
* **Manage Items:**
  + **Edit tags, add metadata (e.g., "Casual," "Formal").**
  + **Delete wardrobe items with confirmation prompts.**

**-Outfit Suggestions**

* **Display Suggestions:**
  + **Show dynamically generated outfit combinations.**
  + **Provide "Save to Favorites" functionality.**
  + **Include filters for occasions or preferences.**
* **UI Design: Use ListView, GridView, or custom widgets for smooth scrolling and interactivity.**

### **2. Backend Development**

#### **Platform: Node.js with Express.js**

* **Purpose: Manage data, provide APIs, and handle business logic.**

#### **Key Features**

1. **Authentication and User Management**
   * **User Registration/Login: JWT for secure token-based authentication.**
   * **Password management: Forgot/Reset password functionality.**
2. **Wardrobe Management APIs**
   * **Upload wardrobe item details (image, tags).**
   * **Retrieve, update, and delete wardrobe items.**
3. **Outfit Suggestion Logic**
   * **Generate outfit combinations based on:**
     + **AI classification (type, color, season).**
     + **Weather conditions (API integration).**
   * **Provide APIs for retrieving suggestions.**
4. **Weather Integration**
   * **Real-time weather data fetch using OpenWeatherMap API.**
   * **Dynamic logic to adjust recommendations for temperature and weather.**

### **3. Database Design**

#### **Platform: MongoDB**

* **Purpose: Store dynamic and semi-structured data for users and wardrobe items.**

#### **Collections**

1. **Users:**
   * **Fields: yet to decided**
2. **WardrobeItems:**
   * **Fields: yet to decided**
3. **OutfitSuggestions:**
   * **Fields: yet to decided**

#### **Optimization**

* **Index frequently queried fields.**
* **Use relationships where necessary (e.g., linking user data to wardrobe items).**

### **4. AI/ML Integration**

#### **Purpose: Enable intelligent classification and matching logic for outfits.**

#### **Key Components**

1. **Image Classification**
   * **Pre-trained models like ResNet or MobileNet for identifying wardrobe item type (e.g., shirt, trousers).**
   * **Color extraction algorithms to identify primary colors of wardrobe items.**
2. **Color Theory-Based Matching**
   * **Implement algorithms to match complementary and analogous colors for outfit suggestions.**
3. **Seasonal Classification**
   * **Add tags for seasons (e.g., "Winter," "Summer") based on material and type.**

### **5. Weather API Integration**

* **Fetch weather details: Temperature, humidity, weather type (rainy, sunny).**
* **Logic for adjustments:**
  + **Example: Recommend jackets for cold weather, avoid light materials for rain.**

**Experience-**

I believe I’m a great fit for this project because I have extensive experience building mobile apps with Flutter. I’ve worked on integrating AI models for image recognition and recommendation systems in past projects, so I’m confident in implementing features like wardrobe classification and color-based outfit suggestions. I’m also skilled in backend development with Node.js and MongoDB, ensuring the app is not only functional but scalable for future growth.

**Relevant past work:-**

**-Recommendation system in an art platform called palette brew(currently under development)**

**-modern Ui’s for numerous amount of e-commerce and saas websites**

**-fully fledged streaming mobile application**

**-An ai based question generator mobile application**

And many more

**Time and budget:-**

**Timeframe:- 1 - 1.5 months**

**Price :- 3,500$**

Which will include

**Frontend Development (Flutter)**: Creation of user authentication (login/registration), wardrobe management screens (upload and tag items), and the outfit suggestion interface (display, filtering, and saving favorites). Push notification integration for daily outfit updates.

**Backend Development (Node.js & MongoDB)**: Development of APIs for user management, wardrobe item CRUD operations, and outfit suggestion generation. Integration with a weather API for weather-based suggestions. MongoDB database setup and API documentation.

**AI/ML Integration**: Integration of pre-trained models for wardrobe item classification (type, color, season) and implementing matching logic for outfit suggestions based on color theory.

**Testing & Quality Assurance**: Unit and integration testing to ensure everything works smoothly, along with bug fixes.

**Deployment & Project Management**: Deploying the app to cloud infrastructure.