WRSPM Analysis for Personal Budget Manager

1. **World Assumptions**
   1. Users have regular access to a desktop or laptop with an internet connection.
   2. Users possess basic financial literacy (understand income, expenses, budgets).
   3. Firebase Realtime Database is available and reachable over HTTPS.
   4. Java 11+ and JavaFX runtime are installed on user machines.
2. **User Requirements**
   1. **Transaction Logging:** User can add, edit, and delete income/expense entries, each with date, amount, category, and description.
   2. **Categorization & Budgets:** User can define budget limits per category (e.g., Food, Rent, Entertainment).
   3. **Alerts:** System warns user when spending in any category reaches or exceeds 90% of its budget.
   4. **Reporting:** User can view spending vs. budget summaries via bar and pie charts, filterable by date range and category.
   5. **Data Portability:** User can import and export all transactions to CSV for backup or offline analysis.
3. **Specifications & Interface Needs**
   1. **Login Screen:**
      1. email/password fields (Clerk Authentication)
   2. **Dashboard View:**
      1. Bar chart of spending vs. budget for each category.
      2. Pie chart showing overall spending distribution
   3. **Transaction Entry Form:**
      1. Transactions sorted in order (by date).
      2. Date picker for transaction date.
      3. Numeric input for amount.
      4. Dropdown for category selection.
      5. Text field for description.
   4. **Reports Screen:**
      1. Date-range picker and category filter controls.
      2. “Export CSV” button that opens a file chooser.
   5. **Settings Panel:**
      1. Fields to set/edit budget limits by category.
      2. Threshold toggle for alerts (ex: 90%, 100%).
4. **Program**
   1. **Language & Framework:** Java 11+ with JavaFX for UI. Next.js with TypeScript, styled with Tailwind CSS and Shadcn UI components.
   2. **Backend:** Firebase Realtime Database accessed via the REST API or Admin SDK. Pinecone DB
   3. **Testing:** JUnit for unit tests covering transaction CRUD, budget limit logic, and CSV import/export.
   4. **Build:** Maven for dependency management and packaging.
5. **Hardware**
   1. **Minimum:** Dual-core CPU, 8 GB RAM, display, broadband internet connection.