**Risk Assessment & Mitigation**

**1. Potential Risks:**

* **Risk 1: API Usage Limits:**
  + Potential for exceeding free-tier API usage limits, resulting in service disruptions.
* **Risk 2: Data Accuracy Issues:**
  + Inaccurate or incomplete movie data from APIs, leading to poor recommendations.
* **Risk 3: Limited Personalization Capabilities:**
  + Difficulty in implementing advanced personalization algorithms within the constraints of free resources.
* **Risk 4: Reliance on Free Resources:**
  + Potential for instability or discontinuation of free-tier services.
* **Risk 5: Scalability Challenges:**
  + Difficulty in handling increased user traffic and data volume with limited resources.
* **Risk 6: Timeline Delays:**
  + Development delays due to unexpected technical issues or team member availability.
* **Risk 7: User Interface/User Experience (UI/UX) issues:**
  + Poor user adoption due to bad UI/UX.
* **Risk 8: Security Vulnerabilities:**
  + Potential security breaches due to inadequate security measures.

**2. Risk Assessment (Impact and Likelihood):**

* **Risk 1: API Usage Limits:**
  + Impact: Medium
  + Likelihood: Medium
* **Risk 2: Data Accuracy Issues:**
  + Impact: High
  + Likelihood: Medium
* **Risk 3: Limited Personalization Capabilities:**
  + Impact: Medium
  + Likelihood: High
* **Risk 4: Reliance on Free Resources:**
  + Impact: Medium
  + Likelihood: Medium
* **Risk 5: Scalability Challenges:**
  + Impact: High
  + Likelihood: Low (initially, but increases with user growth)
* **Risk 6: Timeline Delays:**
  + Impact: Medium
  + Likelihood: Medium
* **Risk 7: UI/UX Issues:**
  + Impact: High
  + Likelihood: Medium
* **Risk 8: Security Vulnerabilities:**
  + Impact: High
  + Likelihood: Low

**3. Mitigation Strategies:**

* **Risk 1: API Usage Limits:**
  + Monitor API usage closely.
  + Implement caching mechanisms.
  + Explore alternative APIs as backup options.
  + Implement API call throttling.
* **Risk 2: Data Accuracy Issues:**
  + Implement data validation and error handling.
  + Cross-reference data from multiple APIs.
  + Allow users to report data inaccuracies.
* **Risk 3: Limited Personalization Capabilities:**
  + Focus on core personalization features first.
  + Explore open-source recommendation libraries.
  + Gather user feedback to improve personalization.
* **Risk 4: Reliance on Free Resources:**
  + Regularly back up data and code.
  + Research alternative free-tier services.
  + Plan for potential migration to paid services if necessary.
* **Risk 5: Scalability Challenges:**
  + Optimize code for performance.
  + Implement efficient data storage and retrieval.
  + Monitor performance and identify bottlenecks.
* **Risk 6: Timeline Delays:**
  + Maintain a flexible project schedule.
  + Prioritize critical tasks.
  + Hold regular progress meetings.
  + Maintain frequent communication.
* **Risk 7: UI/UX Issues:**
  + Conduct thorough user testing.
  + Iterate on design based on user feedback.
  + Adhere to UI/UX best practices.
* **Risk 8: Security Vulnerabilities:**
  + Implement input validation and sanitization.
  + Use secure authentication and authorization methods.
  + Regularly update dependencies and libraries.
  + Follow security best practices.