Scoring Methodology

To rank potential matches more effectively, we developed a quantitative scoring system that evaluates compatibility based on multiple aspects of user profiles beyond dealbreakers. Each factor is assigned a weight based on its impact on relationship success.

Scoring Formula

For each potential match (user1, user2), we calculate a **compatibility score** using the formula:

Compatibility Score = (W1 * Personality Match) + (W2 * Interests Match) + (W3 * Lifestyle Alignment) + (W4 * Dealbreakers Match) + (W5 * Communication Style Match)

where **W1–W5** are weight factors assigned to different compatibility dimensions:

- **Personality Match (30%)** – Based on personality traits and values alignment.
- **Interests Match (20%)** – Shared hobbies, activities, and interests.
- **Lifestyle Alignment (20%)** – Similar daily routines, habits, and long-term goals.
- **Dealbreakers Match (20%)** – Non-negotiable factors like smoking, religion, and kids.
- **Communication Style Match (10%)** – Preferred ways of interacting and resolving conflicts.

Each factor is normalized to a score between **0 and 1**, where **1** represents a perfect match.

Factors Considered

1. Personality Match (30%)

- Users are scored based on Big Five personality traits or similar compatibility metrics.
- A match receives a higher score if users have complementary or aligned traits.
- Example: An extrovert and introvert may score lower than two extroverts if social interaction is a priority.

2. Interests Match (20%)

- Common interests in sports, music, movies, books, and hobbies.
- A match receives a higher score if both users enjoy similar activities.
- Example: Two users who both love hiking and traveling score higher than those with no common hobbies.

3. Lifestyle Alignment (20%)

- Daily routines, work-life balance, dietary preferences, and fitness habits.
- Higher scores for users with similar lifestyles.

Rank	User 1	User 2	Personality	Interests	Lifestyle	Dealbreakers	Communication	Compatibility Score
1	Alice	Bob	0.9	0.8	0.7	1.0	0.9	**0.86**
2	Alice	Charlie	0.7	0.9	0.6	1.0	0.8	**0.80**
3	Alice	David	0.6	0.7	0.5	1.0	0.7	**0.72**

- Example: If both users prefer a structured schedule and healthy eating, they score higher.

4. Dealbreakers Match (20%)

- As implemented in Task 1, but weighted lower since preferences beyond dealbreakers are considered.
- Users with exact dealbreaker matches get full points.

5. Communication Style Match (10%)

- Preferred communication (texting, calling, in-person, frequency of communication).
- Conflict resolution styles.
- Higher scores for similar or complementary communication styles.

Example Rankings

Explanation:

- **Alice & Bob** rank the highest due to strong personality, dealbreaker, and communication alignment.
- **Alice & Charlie** have a high interest match, but slightly lower lifestyle and communication alignment.
- **Alice & David** rank lowest due to lower personality and lifestyle alignment.

Automation of Ranking Process

1. **Data Normalization:** Convert qualitative attributes (e.g., personality types, interests) into numerical values between 0 and 1.
2. **Weight Assignment:** Assign pre-defined weights to each factor based on relationship success studies.
3. **Pairwise Comparison:** Iterate over all possible user pairs and compute compatibility scores.
4. **Sorting & Ranking:** Sort matches in descending order based on their scores.
5. **Output Final Rankings:** Store and display ranked matches with explanations.

Feasibility & Future Improvements

- The ranking system is fully automatable using machine learning models trained on historical successful matches.
- Future iterations could incorporate user feedback and refine weighting dynamically.
- Implementing AI-driven recommendations based on past interactions can enhance match accuracy.