Problem A: Roller Coaster

There are several Roller Coaster rating/ranking sites online that, while taking some objective measures into account, heavily rely on subjective input to determine the rating or ranking of a particular roller coaster (e.g., an “excitement” or “experience” score of an “expert” rider to measure“thrill”).

In addressing this HiMCM problem, consider only roller coasters currently in operation. We have provided data for a subset of operating roller coasters whose height, speed, and/or drop are above the average of worldwide operating coasters. Therefore, we have not included family or kiddie coasters, nor have we included bobsled or mountain type coasters.

1. Create an objective quantitative algorithm or set of algorithms to develop a descriptive roller coaster rating/ranking system based only on roller coaster numerical and descriptive specification data (e.g., speed, duration of ride, steel or wood, drop).

- On a scale of 1-5 stars
- 1 or 2 for things like steel or wood
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2. Use your algorithm(s) to develop your “Top 10 Roller Coasters in the World” list. Compare and discuss the rating/ranking results and descriptions from your team’s algorithm(s) with at least two other rating/ranking systems found online.
- Highest overall ranking
- Down to the 4th decimal point

Compare:
- Public opinion
- Feature based
- Enthusiast

3. Describe the concept and design for a user-friendly app that uses your algorithm(s) to help a potential roller coaster rider find a roller coaster that she or he would want to ride.
- Track location
- Have factors such as when it was built, what is it out of, already in the background of it (this will factor into the ranking but is not filled out by the person)
- Ranking system
    - Thrill
    - Safety

- Duration (Average)
    - Different times during the day
- Syncing apple watch for heart rate
- Vomit meter
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NOTE: You DO NOT need to program and/or write code for the app. You are developing the concept and design for the app only.

4. Write a one-page non-technical News Release describing your new algorithm, results, and app.

Ranking system:

- Filtering
    1. Location
    2. Thrill
    3. Line duration
    4. Vomit meter
    5. Safety
        - These filters can also be reverse searched when one is looking for a ride, such as “location: within 5mi, 20mi, etc”
- Input and output system
    - Searching for your rise within the output to see what it’s like
    - Your review will be taken into the input
- Work ranking
    - Assigning weight:
        - Location: %_
        - Thrill %_
        - Line duration %_
        - Vomit meter %_
        - Safety %_
    - Mode the answers for each filter (most common response)
    - Expected value for the world rank (in relevance to the weight)

Location:

Thrill:

| Factor | Weight |
|---|---|
| **Height** | 8 |
| **Speed** | 10 |
| **Length** | 5 |
| **Number of Inversions** | 7 |
| **Drop Height** | 10 |
| **Duration** | 6 |
| **G-Force** | 8 |
| **Vertical Angle** | 9 |

Vomit Factor:

| Factor | Weight |
|---|---|
| **Height** | 5 |
| **Speed** | 10 |
| **Length** | 10 |
| **Number of Inversions** | 10 |
| **Drop Height** | 7 |
| **Duration** | 10 |
| **G-Force** | 10 |
| **Vertical Angle** | 9 |

Safety:

| **Factor** | **Weight** |
| --- | --- |
| Construction (Wood or Steel) | 7 |
| Status (Operating or Not) | 10 |
| Year/Date Opened (Age) (Current year - year, older is “worse”) | 5 |
| Medical Condition (how many restrictions: Less restrictions = more safe, subtract the number of people with banned conditions from total population) / Participant Height (Be a filter) | 8 |