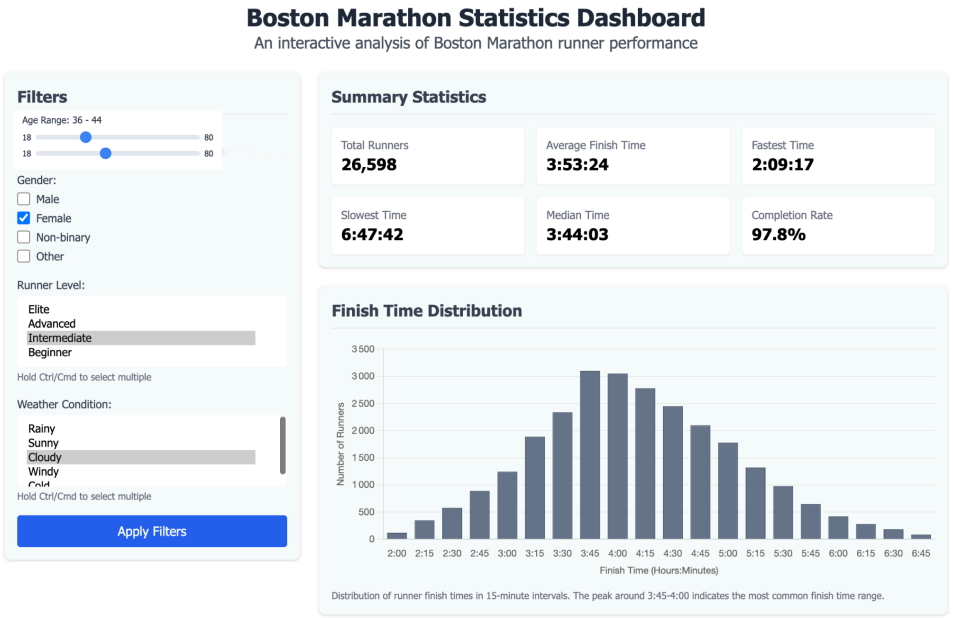
Milestone 2 : Boston Marathon Visualization Platform

1. Sketches and homepage description

1.1 Homepage



On the left, users find a comprehensive **filter panel**, allowing exploration by:

- **Age range** (using a dual-handle slider),
- **Gender** (multi-select checkboxes),
- **Runner level** (elite to beginner, multi-select),
- **Weather condition** (multi-select list).

A bold **“Apply Filters”** button lets users dynamically update the view, encouraging interactivity.

1.2 Summary and Demographics View

To the right, **summary statistics** are prominently displayed in cards:

- Total runners
- Average, median, fastest, and slowest finish times
- Completion rate

These stats provide immediate insight into overall marathon trends.

1.3 Strategy Explorer

This section lets users explore average pacing strategies depending on their profile (e.g., age group, gender, finish time). We will use D3 to display line charts and streamgraphs showing pace evolution over race segments. An option will allow comparison against elite runners or similar profiles using brushing and linking.

1.4 Course Profile Map

We will implement a simple interactive map with elevation profiles linked to race milestones. The terrain view (built with D3 + TopoJSON or Leaflet) helps the user understand why pacing shifts at specific kilometers.

1.5 Storytelling Strategy: We will build the site structure around the "user journey" of preparing for the Boston Marathon: *"Who are the runners?", "What does success look like?", "How do I fit in?", "What's my strategy?"*

3. Additional Ideas

Strategy Clusters: Automatically classify pacing profiles using unsupervised learning algorithms (e.g., K-means, DBSCAN). Runners can be grouped by similarity in their pace curves, then visualized through a scatterplot or parallel coordinates chart. This can help identify archetypal strategies (e.g., consistent pacers, late accelerators, early over-pacers), and provide insights for training or comparison.

Race Condition Comparison Mode: Enable users to select and compare two weather conditions or years side by side. The dashboard elements would update in parallel panes. This supports causal inference questions like "Did rain slow everyone down in 2016?"

5. References to Course Content

Interaction (5.1, 5.2): Use of sliders, filters, and brushing for dynamic data exploration.

Marks & Channels (6.2): Clear encoding of pace, gender, and finish times using position, color, and size.

Perception & Color (6.1): Accessible color palette for categorical and quantitative data.

Design Principles (7.1, 7.2): Clean layout, hierarchy, and readability across views.

Maps (8.1, 8.2): Course profile with D3/TopoJSON or Leaflet for elevation understanding.

Text Viz (9): Runner quotes to humanize clusters.

Graphs (10): Clustering pacing strategies and displaying via parallel coordinates or node-link diagrams.

Sound & Beyond Viz (11.2, 12.2): Optional audio feedback and creative coding ideas.

Storytelling (12.1): Structure follows user journey—exploration, insight, personalization.