

## Group 9

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**Site link:** <https://dv-project-2.vercel.app/>

### Screenshots And Corresponding Questions With Explanation:

**1. Dashboard:** The Ultramarathon Dashboard provides an interactive overview of endurance racing, showcasing key metrics, race timelines, and performance comparisons. It explores runner demographics, average speed variations with age, and gender-based performance differences, offering insights into trends across ultramarathon events.

The screenshot shows the 'Marathon Performance Analytics' section of the dashboard. At the top, there are four cards: 'Average Completion Rate' (87.3%, up 2.5% from last year), 'Average Finish Time' (11h 42m, down 18 minutes from last year), and 'Total Participants' (15,847, up 12% from last year). Below these cards, there is a table comparing ultramarathons from five countries based on average time, participants, and success rate.

Country	Average Time	Participants	Success Rate
Spain	10h 15m	1,245	92%
France	10h 45m	1,567	89%
United States	11h 05m	2,890	85%
Japan	11h 20m	1,123	91%
Kenya	11h 30m	456	88%

The screenshot shows the 'Finishers Data' section of the dashboard. It includes three cards: 'Age Distribution' (35-45 is the peak performance age group), 'Gender Distribution' (68% Male / 32% Female), and 'Most Popular Distance' (50km, with a 15% participation increase).

## 2. Questions:

**Q1)** How has the number of finishers varied over the years for different race formats (e.g., 50 km, 100 km, and others), and what trends can be observed in participation for each race type?



### Explanation:

This visualization consists of two charts:

#### Line Chart: Number of Finishers Over the Years

- This line chart tracks the number of finishers in different distance categories over time, categorized into **kilometers and miles** (e.g., **50-100 km, 100-150 km, 50-100 mi, 100-150 mi**).
- The **red line**, representing one of the categories, shows a **sharp increase in participation over the years**, peaking around **2019**, followed by a **steep drop in 2020** (likely due to the COVID-19 pandemic), and then **partial recovery** in the following years.
- Other categories show a **more gradual increase** over time, with minor fluctuations.

#### Pie Chart: Age Distribution

- The pie chart provides insights into the **age distribution of participants**, likely segmented by male and female categories.
- The largest age group contributes **23.6% of the participants**, followed by others at **19.6%, 18.4%, 16.5%, etc.**
- This indicates that certain age groups are more dominant in the competition, potentially younger to middle-aged participants.

### Inference:

- **Pre-2020 Growth:** The number of finishers showed **steady growth**, suggesting increasing participation in long-distance running events.
- **COVID-19 Impact:** The **sharp dip in 2020** likely reflects the pandemic's effect on outdoor events, followed by **recovery trends** post-2021.
- **Distance-Based Trends:** Longer distances (red line) saw a **massive surge** in participation compared to shorter distances, indicating **growing interest in ultra-endurance races**.

**Overall Conclusion:** The visualization highlights **trends in endurance sports participation**, showing the **growing popularity of ultra-distance events** and how external factors (like COVID-19) affected participation levels.

**Q2)** How does the average speed of runners vary with age, and what differences can be observed between male and female participants?



## **Explanation:**

This visualization consists of a **bar chart** that analyzes the relationship between age and average running speed while comparing male and female participants.

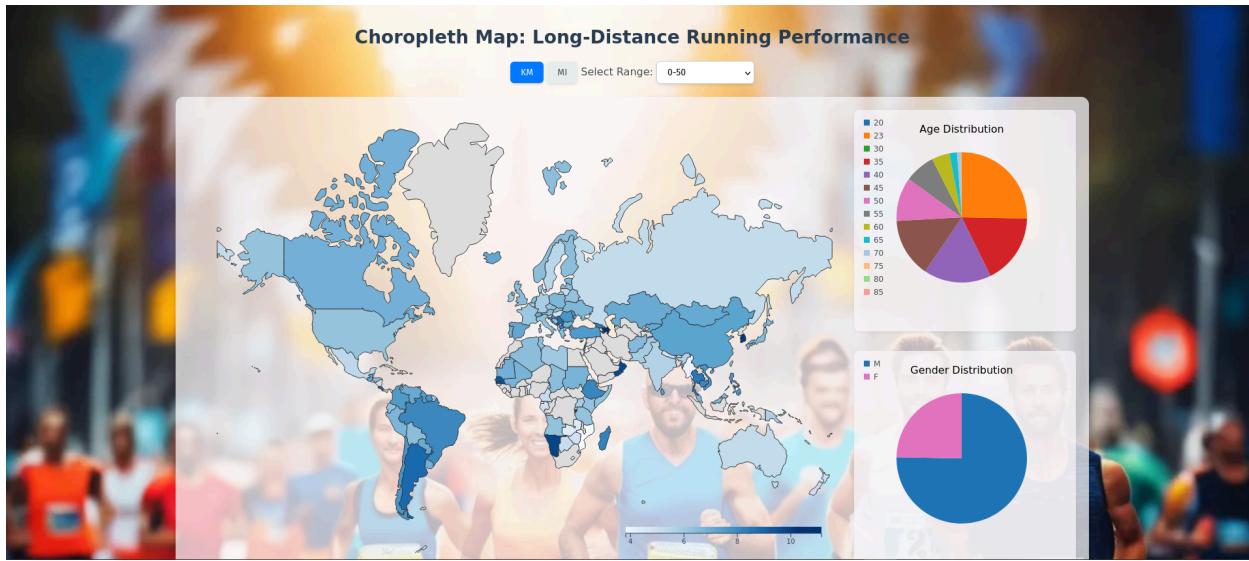
This comparison helps us understand how running performance changes with age and whether gender differences exist in speed trends across different age groups.

## **Inference:**

- ◆ **Peak Performance:** The highest speeds are observed in younger age groups (20s-30s), gradually declining with age.
- ◆ **Gender Differences:**
  - Male runners generally have a higher average speed than female runners across most age groups.
  - The gap is more noticeable at younger ages and narrows as age increases.
- ◆ **Decline with Age:** The speed of both male and female runners decreases steadily after 40, with a sharper decline beyond 70. However, some older age groups still maintain competitive speeds.

This visualization provides insights into the endurance capabilities of different age groups and gender-based performance trends in ultramarathon running.

**Q3)** What is the average completion time of athletes from different countries in long-distance running events, and do any countries consistently outperform Others?



## Explanation:

This visualization consists of three key components:

### Choropleth Map: Long-Distance Running Performance

- The map visually represents the **average completion time** of athletes from different countries in long-distance running events.
- Darker blue shades indicate **faster completion times**, while lighter shades suggest **slower completion times**.
- This helps identify **regional trends** and highlights nations that consistently perform well.

### Age Distribution Pie Chart

- This chart shows the proportion of athletes across different **age groups** participating in long-distance events.
- It helps analyze whether younger or older runners tend to dominate performance metrics.

### Gender Distribution Pie Chart

- This chart represents the **gender breakdown** of participants in these running events.
- It provides insights into male vs. female participation rates and whether gender influences performance.

## Inference:

- ◆ **Performance Variation by Region:**

- Countries with **higher participation and structured training programs** tend to have better completion times.
- Regions with **fewer competitive runners** may have higher average completion times.

- ◆ **Age and Gender Impact:**

- If younger age groups dominate, it suggests endurance peaks at a certain age range.
- A gender-based time gap may indicate physiological differences or training disparities.

This analysis helps identify **global performance trends** in long-distance running and potential areas for improvement.

## Work done by Each Member:

**Mehul Agarwal:** Led the analysis for Question 2, where he extracted the relevant data, developed the code for visualizations, and compiled the findings into the report. He also had a significant contribution in designing and structuring the dashboard, along with team members. He drafted the report, and sourced the images to really enhance the project.

**Navishaa Agarwaal:** Focused on Question 1, the person who is coding the visualizations, drafted the report. She helped develop the dashboard with the rest of the team, making changes to its structure and functionality, and also produced the explanatory video.

**Saiyam Jain:** Managed Question 3 with data extraction and coding for an analysis. He also played an integral part in building the dashboard in which he provided support for content organization and ensured visualization of the insights was effective. He also deployed the dashboard ensuring it could be used and accessed and also produced the explanatory video.