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| Date | 28 June 2025 |
| Team ID | LTVIP2025TMID49154 |
| Project Name | Comprehensive Analysis and Dietary Strategies with Tableau: A College Food Choices Case Study |
| Maximum Marks | 4 Marks |

12. Performance Testing of Visualizations

12.1 Objective

The goal of performance testing is to evaluate the **efficiency, responsiveness, and scalability** of the Tableau dashboards created for analyzing college food choices. Performance tests ensure that the visualizations load quickly, render correctly across devices, and remain responsive during user interaction such as filtering or switching scenes.

12.2 Key Performance Metrics

| Metric | Description |
|------------------------------|--|
| Dashboard Load Time | Time taken for the dashboard to load completely after initial access |
| Visualization Rendering Time | Time taken to load individual charts or visual components |
| Filter Response Time | Time taken to reflect results after applying a filter or parameter |
| Calculated Fields Evaluation | Time spent computing formulas, KPIs, or conditional visuals |
| Data Volume | Number of rows and columns processed within each worksheet |

12.3 Testing Parameters

| Test Parameter | Value |
|---------------------|---------------------------------------|
| Dataset Size | ~125records × 82+ columns |
| Visualizations Used | 24 (bar, pie, line, bubble, heat map) |
| Story Scenes | 1 Tableau story with 8 scenes |

| Test Parameter | Value |
|-------------------|---|
| Filters Applied | Gender |
| Calculated Fields | 12+ (e.g:-Gender_label,coffe_label,...) |

12.4 Tools Used

- **Tableau Performance Recorder** – Built-in tool to log and analyze performance
- **Browser DevTools** – Used to measure page load time when embedded via Flask
- **Manual Testing** – Cross-device checks (Desktop, Tablet, Mobile)

12.5 Test Results Summary

| Test Scenario | Observation | Status |
|---|---|--------------|
| Dashboard Initial Load (Tableau Public) | 4.2 seconds on average | ✓ Pass |
| Filter Response (e.g., Gender = Female) | 1.1 seconds | ✓ Pass |
| Story Scene Switch Time | 2.3 seconds between transitions | ✓ Pass |
| Visual Rendering with All Filters Applied | Slight lag on mobile, smooth on desktop | ⚠ Acceptable |
| Load on Flask Web Page | Fully rendered within 5–6 seconds (including embedded script) | ✓ Pass |

12.6 Recommendations for Optimization

| Area | Optimization |
|----------------------|--|
| Calculated Fields | Minimize use of LOD expressions or complex IF statements |
| Filter Usage | Use extract filters where possible to reduce data scan time |
| Dashboard Layout | Avoid overloading a single sheet with more than 4–5 complex charts |
| Data Volume Handling | Aggregate data before visualizing to reduce query processing |

12.7 Conclusion

The dashboard performs **well under expected data volumes**, with acceptable response times for interactive features. With some light optimization, the system is highly usable and scalable for larger datasets in the future.