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TEAM ID	LTVIP2025TMID52276
PROJECT NAME	Comprehensive Analysis and Dietary Strategies with Tableau: A College Food Choices Case Study
MARKS	2 MARKS

# SOLUTION ARCHITECTURE

This architecture outlines the flow of data from collection to final presentation, incorporating backend processes, data transformation, and visualization components.

## Layered Architecture

### A. Data Collection Layer

- **Input Sources:**
    - Google Forms or survey tools (Food logs, preferences)
    - CSV/Excel from dining system
  - **Output:** Raw data in Excel/CSV format
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### B. Data Processing & Transformation Layer

- **Tool:** Excel / Python (pandas)
  - **Tasks:**
    - Remove duplicates, handle missing values
    - Standardize food names and units
    - Convert food items to nutrients using lookup table (e.g., USDA data)
    - Derive calculated fields (e.g., calories/day, protein %, junk food ratio)
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### C. Data Storage Layer

- **Format:** Cleaned CSV / Excel files
  - **Optional:** SQLite / MySQL (if scaled up)
  - **Used By:** Tableau as a data source
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### D. Visualization Layer (Tableau)

- **Tool:** Tableau Desktop / Tableau Public
  - **Components:**
    - Interactive Dashboards (Nutrient balance, budget trends, skipping patterns)
    - Story Points (Insight Narratives)
    - Filters (Year, gender, food type)
  - **Output:** Packaged Tableau workbook (.twbx) or public link
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## E. Web Integration Layer (Optional)

- **Tool:** Flask (Python Web Framework)
- **Tasks:**
  - Embed Tableau Public dashboards in HTML templates
  - Host on local server or PythonAnywhere
  - Add navigation, filtering options, PDF download button

## Security & Privacy Considerations

- Student data anonymized using `Student_ID`
- No collection of personal identifiers like email, contact
- Data shared only through public dashboards or with admin permission