1. Basic Functionalities

1.1 Define Time Blocks

- **Description**: Divide the day into 20-minute intervals from 7 AM to 7 PM.
- **Input**: None (predefined intervals)
- **Output**: List of time intervals
- **Contribution**: Forms the basic structure to simulate scheduling and staffing.

1.2 Assign Number of Employees per Time Block

- **Description**: Allows the user to input how many employees are scheduled per time block (between 2–4).
- **Input**: Integer values entered by user for each time block
- **Output**: Time block schedule with employee count
- **Contribution**: Controls staffing levels, which directly impact wait times and costs.

1.3 Mark Peak vs Non-Peak Time Blocks

- **Description**: Identifies which blocks are peak hours.
- **Input**: Predefined list of peak block indices
- **Output**: Boolean flag for each block
- **Contribution**: Differentiates customer arrival rates and wait time expectations.

1.4 Simulate Customer Arrivals and Wait Times

- **Description**: Simulates daily customer flow and estimates wait times using Poisson and Exponential distributions.
- **Input**: Time block schedule, arrival rate (λ), wait time lookup
- **Output**: Average wait time per customer

- **Contribution**: Core functionality to evaluate customer experience under current staffing.

1.5 Calculate Daily Labor Cost

- **Description**: Computes total employee-hours and multiplies by hourly wage.
- **Input**: Number of employees per block
- **Output**: Total daily labor cost ($)
- **Contribution**: Provides financial insight into the cost of staffing decisions.

1.6 Run Simulation Over Multiple Days

- **Description**: Repeats daily simulation to get average wait time over several days (default 1000).
- **Input**: Number of days
- **Output**: Long-run average wait time
- **Contribution**: Improves accuracy of results by accounting for randomness over time.

2. System Overview – Input, Process, Output

Diagram: System Flow Overview