Group 3: Chomper Studios

Christopher Rojas, Denisjann Reyes, Yiu Yiu Yoyo Ho

Part I (Task 1) – As a studio select one project from the given list of Topics

Original System

- Target: Tim Hortons
- Location: Centennial College - C Building - Marketplace
- Operation Hours: 08:00 - 14:00 every weekdays

Activities

- Customers arrive and join the line
- Customers reach the counter and place an order
- Customers receive their order and leave

Observable Elements

- Customers (arrival, queueing, and departing)

Observable Data

- Time of customer arrival
- Time of customer departure
- Time of customer reaching the counter
- Service duration per customer
- Waiting time before service
- Number of customers in a fixed period (every 5 minutes)

Simulation Events

- A customer arrives and joins the queue.
- A customer reaches the counter to place an order.
- A customer departs after receiving their order

Simulation Input Data

- Arrival rates of customers
- Distributions of Customer categories (Express, Regular, Mobile order)

Collectable Data

- Arrival timestamp of customers
- Serve timestamp of customers
- Departure timestamp of customers
- Service duration for selected customers (from arrival to departure)
- Waiting time in line for selected customers (from lining up to being served)
- The number of customers every 5 minutes
- Types of counters (Express, Regular, Mobile Order)

Part I (Task 2) – Decide on and do the required observations

Observation Period 1: 2025/02/18 (10:15 - 11:00)
Observation Period 2: 2025/02/19 (12:45 - 13:25)

Data Collect:

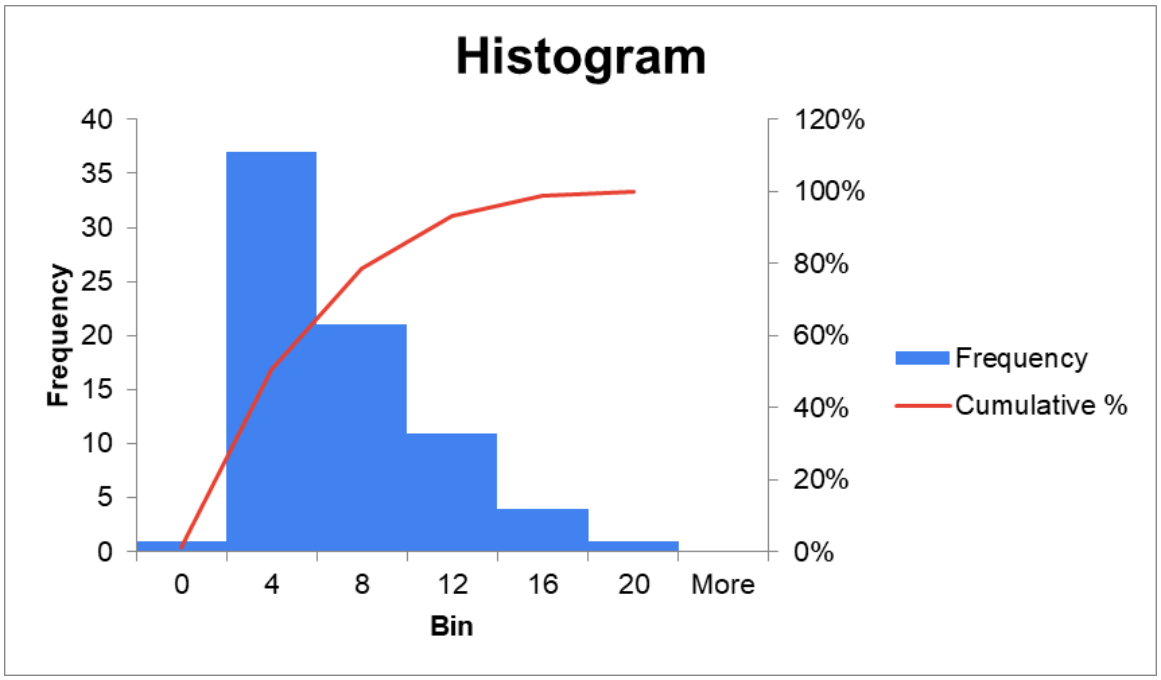
- Service Time = Departure Time − Arrival Time
- Waiting in Line Time = ReachCounter Time - Arrival Time
- Total customer in store every 5 minutes

Raw data, processed data, and charts with different bin sizes are included in the Excel file.

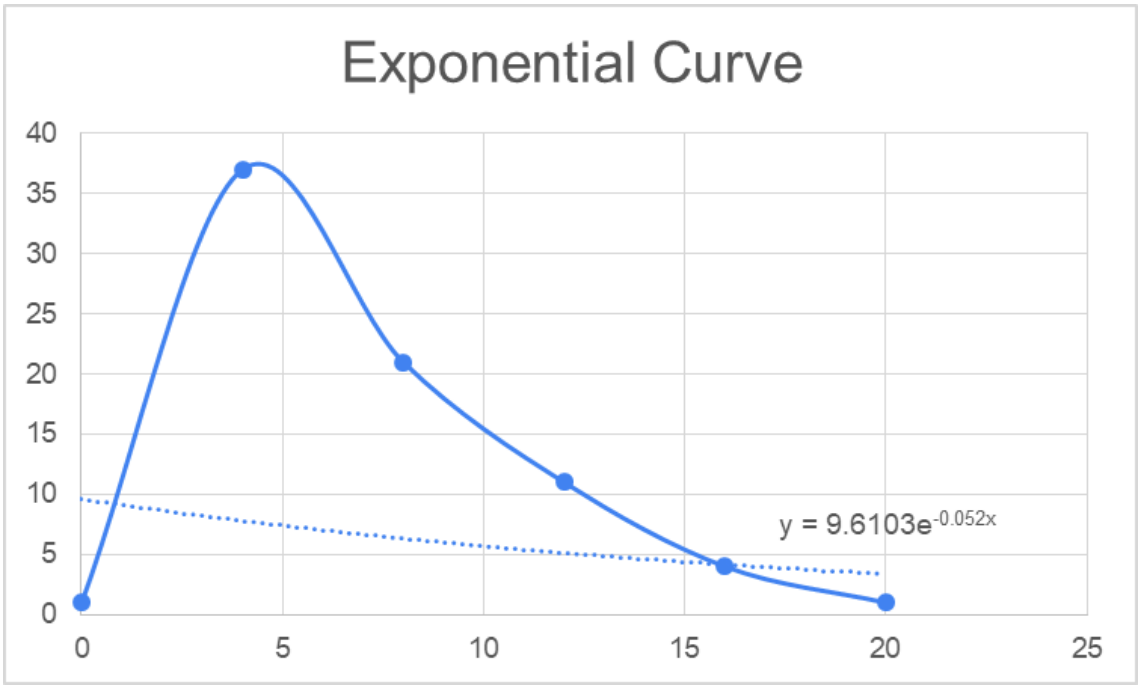
Part I (Task 3) – Process the observed data

Service Duration

- **Smoother histogram at 4 minutes bin size**

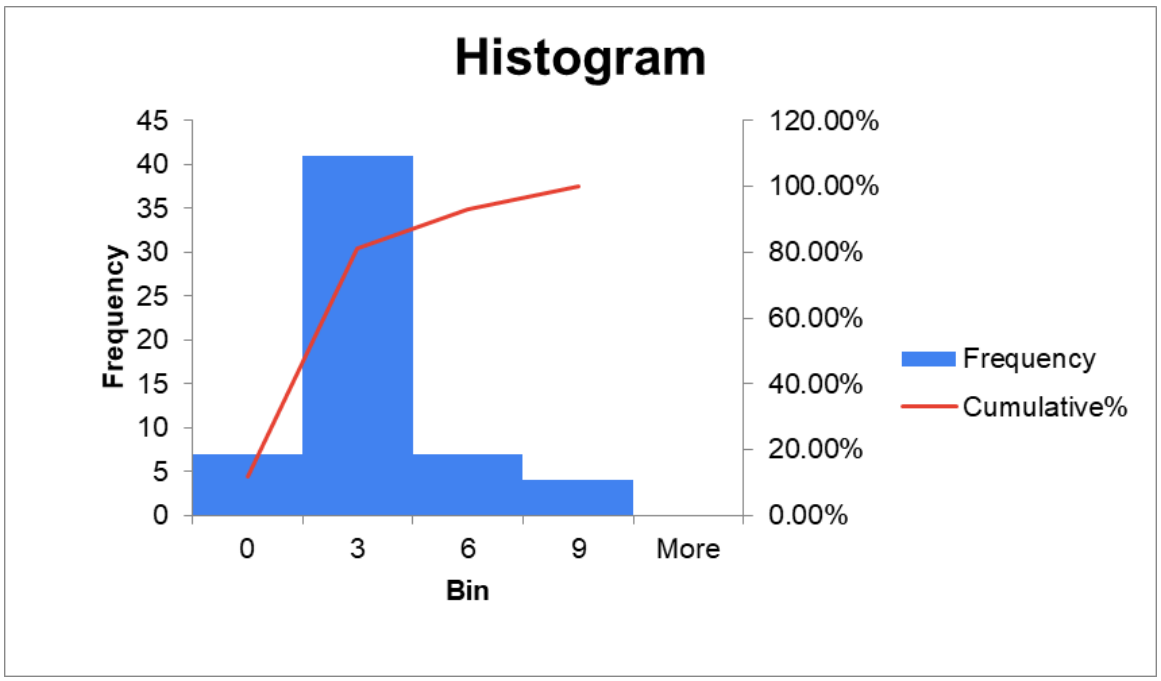


- **Curve Fitting with Exponential at 4 minutes bin size**

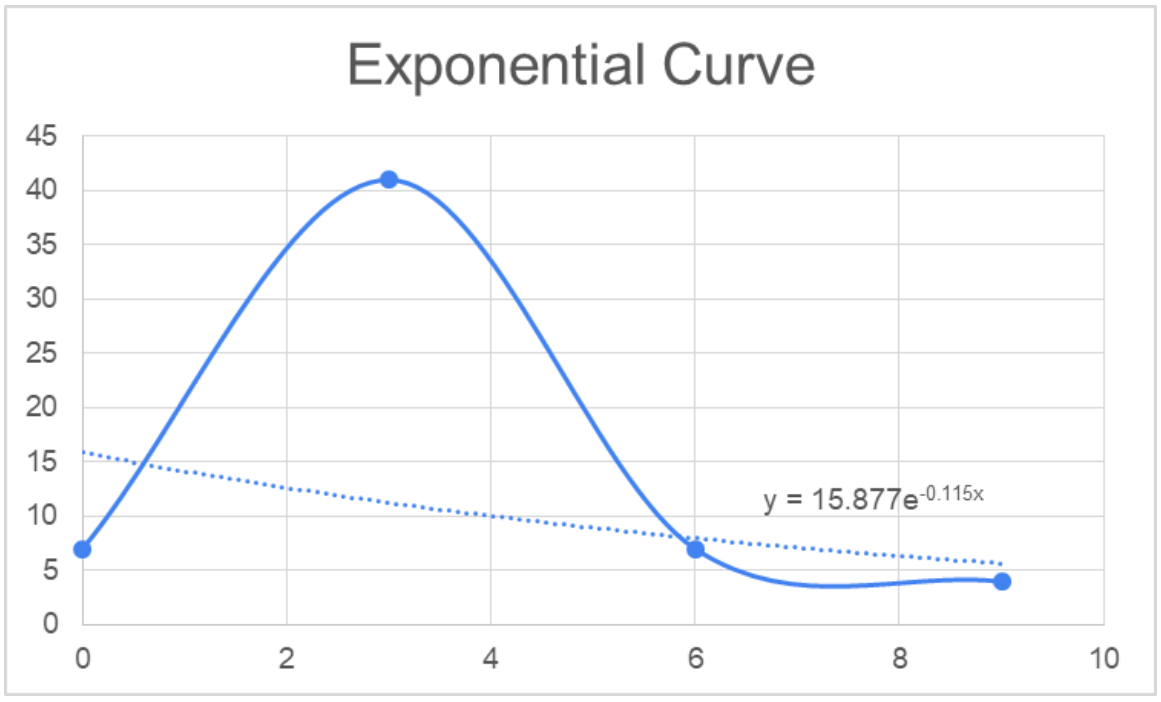


Waiting in Line Duration

- **Smoother histogram at 3 minutes bin size**



- **Curve Fitting with Exponential at 3 minutes bin size**



Total Number of Customers in Store vs. Time (Curve Fitting with Exponential)