**Introduction**

This report presents the findings of a simulation study conducted to analyze the checkout process at a small gift shop. The simulation aimed to assess key performance indicators such as average customer wait time and the percentage of idle time for the checkout clerk.

**Methodology**

**Simulation Setup**

* **Parameters:**
  + Interarrival times: Uniformly distributed between 1 and 15 minutes.
  + Service times: Uniformly distributed between 1 and 8 minutes.
  + Simulation duration: 180 minutes (3 hours).
* **Excel Spreadsheet:**
  + Columns for customer number, arrival time, service time, start and end service times, time in the system, and idle time.
  + Formulas to generate random arrival and service times within the specified limits.
* **Performance Measures:**
  + Average Customer Time in the System (W): Calculated as the difference between the end service time and the arrival time.
  + Percentage of Time the Server is Idle: Calculated as the total idle time divided by the total available service time.

**Data Table for Replications**

* To assess the variability of the results, 50 replications of the simulation were conducted using a data table in Excel.
* A random number generator was used to trigger recalculations for each replication.

**Results**

After running 50 simulations, the following results were obtained:

* **Average Customer Time in the System (W):** The average wait time for customers ranged from **[X]** to **[Y]** minutes, with an overall mean of **[Z]** minutes.
* **Percentage of Time the Server is Idle:** The checkout clerk's idle time varied between **[A]**% and **[B]**%, with an average of **[C]**% across all replications.

**Conclusion**

The simulation provided valuable insights into the checkout process of the gift shop. The results indicate that the average customer wait time is **[Z]** minutes, which **[insert assessment of whether this is acceptable or needs improvement]**. Additionally, the checkout clerk's idle time is **[C]**%, suggesting **[insert analysis of idle time, e.g., whether it's optimal or if staffing levels could be adjusted]**.