

Damri Bus Arrival Patterns In Bandung City

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Abstract

The findings of this study suggest that salary and motivation have a substantial impact on the performance of PT CIMB Niaga workers in Surabaya. Data research revealed that these three factors have a positive and substantial link with employee performance. Fair and appropriate remuneration incentivizes individuals to perform better. Employees who believe they are compensated fairly for their efforts tend to perform better. Compensation considerations like as salary, bonuses, and perks all have an impact on employee performance, with compensation being one of the most influential. Positive connections among coworkers, good communication, and fair treatment all lead to improved performance. Work motivation has a substantial impact on employee performance. Employees with strong intrinsic and extrinsic drive tend to perform better. Opportunities for advancement, as well as acknowledgment and support from colleagues and superiors, all contribute significantly to increased job motivation..

Keywords: Damri,Cibiru,Cibeureum

Introduction

One of the reasons of congestion in metropolitan areas is the growing preference of transportation service users for private automobiles over public transit, resulting in more intense traffic flow. Setiawan (2021). As a result, it is critical to provide public transportation facilities that help individuals transition from private automobiles to public transportation and are enough to serve persons who utilize public transportation. The diminishing importance of public transportation is partly due to the poor degree of public transportation service (Setiawan, 2022). A poor level of service is defined as inadequate facilities and infrastructure, lengthy journey times, a large number of passengers exceeding carrying capacity, low levels of comfort, insufficient network systems, and problematic accessibility to particular places (Nashrullah, 2022). Congestion is common on the route. As a result, in order to provide better, more efficient, and effective transportation, individuals should be encouraged to utilize public transit. This is to decrease traffic jams that occur on road sections. It has the potential to cut not just travel time and congestion, but also air pollution.

In order to address this, the City of Bandung has launched the Damri Bus extension to strengthen current urban transport services. Damri Bus is a bus system that is swift, pleasant, safe, and timely in terms of infrastructure, vehicles, and timetables. The Bandung Bus Rapid Transit operations work with the private sector to administer it. The queuing model has a broadly dispersed arrival pattern and as many service facilities as feasible. Setiawan (2022).

A model is a simplified depiction of a portion of the actual world or an entire system that focuses on certain features deemed relevant from a specific perspective (Setiawan, 2020). The question remains: should we develop an explicit model or not? In an explicit model, clear assumptions form the foundation, allowing us to understand what is imposed on the model.

Statistical models must be built to explain the fundamental factors in diverse human accomplishments. The probability distribution model is the most basic and often used model. This is connected to the value of the fundamental factors that result from opportunities (Setiawan, 2022). Models may be used to accurately express a connection in a way that raw words cannot. As a result, the model may answer difficulties involving the link between behavior in a phenomena and previously unidentified attributes. Finally, in certain models, interactions between people at various entities may be studied at lower levels, resulting in patterns at higher levels. This relationship is particularly relevant to the social sciences. In the social sciences, interactions between people produce society, which determines the behavior of linked indicators or groups. Because of these features, the concept is appealing to individuals who analyze society through the lens of self-management (Nashrullah, 2022).

Queuing Theory is the mathematical study of queues or waiting line events, specifically a line of consumers awaiting services from the current service system. In our everyday lives, we often come into this situation. The average wait time is highly dependant on the average service speed. Waiting may occur when the demand for services exceeds the available service capacity, resulting in customers not being supplied promptly. In the queuing model, the connection between the bus and the passengers is tied to the time the bus gets to finish a queue. (Setiawan, 2022).

The passenger service time model at bus stops is consistent with the single linear regression model for dwelling time development. The proper residence time model for the Trans Jogja Bus is the total of the boarding and alighting passenger service times, as well as other service periods. The residence time model developed in this study accurately portrays the Trans Jogja Bus, a BRT prototype bus. As a BRT pioneer, the Trans Jogja Bus offers unique features such as a high floor, a single door for entrance and departure, and travel guide help at stations and aboard the bus. Previous study on residence time did not reveal this issue. (Setiawan, 2022).

When the number of trials is high and the chance of an event is small, the Poisson distribution is a binomial distribution with few event instances. The "parameter" of the Poisson distribution technique is the number of times the general probability, or "expected" number of occurrences (Setiawan, 2022). In other words, the Poisson distribution is used to sample a random plot of a specific size from which there is a low possibility of finding what you are searching for, resulting in the majority of the data being zero (Nasrullah, 2021).

The Damri Bus System is a road-based mass transit system that uses special and exclusive lanes. Meanwhile, the busway-based Damri Bus is a mass public transportation facility with a bus mode in which vehicles operate on a designated track beside the fast lane.

Methods

This study involves conducting a field survey at the Cibiru and Cibereum bus stops. The Cibiru bus stop survey will take place from January 3-10, 2024. After that, count the number of passengers that arrive at that bus stop to get passenger statistics.

Results and Discussion

Secondary Data

Secondary data is gathered from references and existing data to enhance research on arrival patterns. Journals, books, and regulations on research methods are essential for understanding research approaches, methods, types, locations, populations, samples, procedures, instruments, and data analysis techniques.

Tabel 1. Normal and Poisson Test Results for Cibiru Bus Stop

Time	Normal		Poisson
	Mean	SD	Lambda
9 Minute	49	14.9	49
19 Minute	159	40.9	159
50 Minute	250	59.5	250
75 Minute	940	146.1	940

Tabel 2. Normal and Poisson Test Results for Cibeureum Bus Stop

Time	Normal		Poisson
	Mean	SD	Lambda
9 Minute	12.5	5.91	12.5
19 Minute	59.1	6.21	59.1
50 Minute	56.2	9.45	56.2
75 Minute	192.4	16.91	192.4

Normal and Poisson Tests at the Cibiru Bus Stop

Table 1 shows the normal and Poisson test results for the Cibiru bus stop every 9 minutes. The normal test yielded a mean of 49 and a standard deviation of 14.9, whereas the Poisson test yielded a lambda value of 49. For 19 minutes, the SD value for data from the normal test with a mean of 159 is 40.9, but the lambda value for the Poisson is 159.

Table 2 shows the normal and Poisson test results for the Cibereum bus stop per 9 minutes. The normal test yielded a mean of 12.5, a standard deviation of 5.91, and a lambda value of 12.5. For 19 minutes of data from the normal test with a mean of 59.1, the SD value is 6.21, but the lambda value for Poisson is 59.1.

Shapiro–Wilk test

The Shapiro-Wilk test employs two distributions, T-test and Wilcoxon (Whitney-Mann), to compare P-values that are less or closer to normal.

T-test and the Wilcoxon (Whitney-Mann) test

The P-Value you are searching for is smaller and closer to normal. Table 9 shows that the P-Value Wilcoxon (Hypothesis Test of actual passenger data with simulated Poisson pnp data) is used for Time per 9 minutes taken, while the P-Value T-test is used for Time per 19 minutes, 50 minutes, and 75 minutes taken. The P-Value you are searching for is smaller and closer to normal. Table 6 shows that for Time per 9 minutes taken, the P-Value T-test is used since it is smaller, however for Time per 19 minutes, 50 minutes, and 75 minutes taken, the Wilcoxon P-Value.

Conclusion

The data shows that bus stations near Cibiru had the largest amount of visitors, with 5200 arriving and 976 departing across 10 hour intervals on Saturday. This research discovered that the mean in the normal test is identical to the lambda in the Poisson test. Proceed to the Shapiro-Wilk test. Because not all P-Values are normal, we utilize two distributions, the T-Test and the Wilcoxon, to determine which P-Value is lower / closer to normal. Table 9 demonstrates that at the Cibiru bus stop, the p-value per 9 minutes is less using the Wilcoxon test, and for 19 minutes, 50 minutes, and 75 minutes smaller using the t-test. Meanwhile, in the table for 6 Cibereum bus stations, the value per 9 minutes is less using the t-test, while the values for 19 minutes, 50 minutes, and 75 minutes are smaller using the Wilcoxon test.

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