Plato Renovation Inc.
(Data Analytics Version)

Introduction

Plato Renovation Inc. is a company that provides home repair and renovation services on the island of Atlantis. Jenny Laski is the founder of this company. Even though the business is booming, Jenny has been struggling with managing the company's accounts receivables. In particular, the estimates of the allowance for doubtful accounts (AFDA) using the aging schedule can sometimes yield big differences from the realized uncollectible amounts. To investigate this issue, Jenny asks you to analyze their historical customer transactions and propose a better approach to estimating AFDA.

Sales Cycle

Normally, for every order, Plato will take a certain amount of down payment from their customers and charge the rest of the amount after the company completes the repair services. Plato's fiscal year end is December. At the end of every quarter, the accounting team analyzes the accounts receivables and estimates that period's AFDA. Following that, the accounting team will keep track of the status of those outstanding receivables. If some of the customers still fail to pay their accounts by the end of the next quarter, Plato typically deems these accounts uncollectible.

Background on Atlantis Island

Atlantis is an island with warm tropical weather located in the south of the mainland. It is famous for the longest pink beach in the world, which attracts hundreds of thousands of tourists every year. As an autonomous jurisdiction with its own laws, Atlantis has evolved into one of the largest tax havens for mainland businesses. In Atlantis, there are three major districts: 1) the tourism area includes the beaches, hotels, resorts, and related small shops; 2) the business area, in the central part of the island, contains many financial institutions, such as banks and insurance companies; and, 3) the residential area consists of a variety of neighborhoods where the Atlantis population lives. Because of its special location and landscape, Atlantis frequently experiences storms with lots of rain, especially during the summer (mostly the third-quarter). The occasional severe storms can cause significant damage to buildings and houses. These storms often lead to increased demand for services from Plato.

One unique part of Atlantis life is its heavy reliance on two long bridges that connect the island to the mainland. Every five years, one bridge that tourists rely on for traveling is closed for periodic inspection and maintenance. The local citizens refer to these periods as a 'bridge' year (2010 and 2015 in our data). During a bridge year, the number of tourists is greatly reduced as it is costlier and more difficult for them to travel to the island. For example, many tourists end up travelling on a boat instead of driving.

Data

Plato provides you with a dataset that contains detailed customer transactions from 2010 to 2019. These transactions represent the accounts receivables at the end of every quarter. Each transaction observation includes the following variables:

- Job completion/billing date (*bus_date*) and its corresponding quarter end (*qend*);
- District in which the customers are located (*district*);
- Total amount billed (*sales*);
- Down payment collected (*upfront*);
- Repayment date (*payment_date*; when customers pays the rest of their bills; missing if never received in the next quarter and thus deemed uncollectible)

In addition to the transactions from 2010 to 2019, Plato also provides you another dataset containing customer transaction in the first quarter of 2020.

Forecast Accuracy

The accuracy of a forecast is determined by comparing the forecast value against the actual/realized value. One common measure of forecast accuracy is to calculate the absolute difference between the actual value and the forecast value (i.e., absolute forecast error). The higher the absolute forecast error is, the less accurate the forecast is.