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## *Proposed Approach for Testing Hypothesis: Price Sensitivity and Customer Churn*

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Dear Estella Altazain,

I've taken some time to delve into the hypothesis regarding the influence of price sensitivity on customer churn within the SME segment. To tackle this from a data science perspective, I've formulated a structured approach to test this hypothesis effectively:

**Hypothesis Formulation:** The hypothesis posits that fluctuations in pricing significantly impact customer churn rates within the SME segment. To test this, the primary data science problem is to determine the relationship between price changes and the likelihood of churn among SME customers.

**Approach Overview:**

1. **Data Collection:**

- Collect historical data encompassing customer churn records and pricing changes over a relevant period.
- Ensure the dataset includes variables such as customer attributes (demographics, usage patterns, tenure), pricing adjustments, and churn indicators.

2. **Data Preprocessing and Feature Engineering:**

- Cleanse and preprocess the data, handling missing values and outliers if present.
- Engineer features that could influence price sensitivity and churn behaviour (e.g., price change percentage, customer tenure, industry sector, contract length).

3. **Exploratory Data Analysis (EDA):**

- Conduct EDA to gain insights into correlations between price changes and churn rates.
- Visualize trends and patterns, exploring how different customer segments react to price adjustments.

4. **Model Selection and Training:**

- Utilize predictive modelling techniques such as logistic regression, decision trees, or ensemble methods to build a model.
- Train the model on a subset of the data, using features related to pricing changes and customer attributes to predict churn probability.

#### 5. **Model Evaluation:**

- Validate the model's performance using appropriate metrics like accuracy, precision, recall, and F1-score.
- Employ cross-validation techniques to ensure the model's robustness and generalizability.

#### 6. **Prediction and Discount Recommendation:**

- Deploy the trained model on new data (monthly or periodic updates) to predict churn probabilities based on price sensitivity.
- Identify customers with a high likelihood of churning due to price changes and recommend a 20% discount as a targeted intervention strategy.

#### 7. **Monitoring and Iteration:**

- Continuously monitor the effectiveness of the discount strategy by tracking customer responses and actual churn rates post-offer.
- Iterate on the model by incorporating new data and refining features to enhance predictive accuracy.

#### **Data Requirements:**

- Historical churn data with timestamps
- Pricing data with details on adjustments and relevant timestamps
- Customer attributes and segmentation information
- Any additional data on customer feedback or satisfaction scores

#### **Analytical Models:**

- Logistic Regression
- Decision Trees / Random Forest
- Gradient Boosting or Ensemble Methods

**Next Steps:** I propose initiating discussions with the client to gather the requisite data and understand any nuances in pricing changes and customer behaviour. We'll then proceed with data preprocessing and model development to validate the hypothesis.

I'm eager to discuss this approach further and align on the next steps in executing this strategy.

Best regards,

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