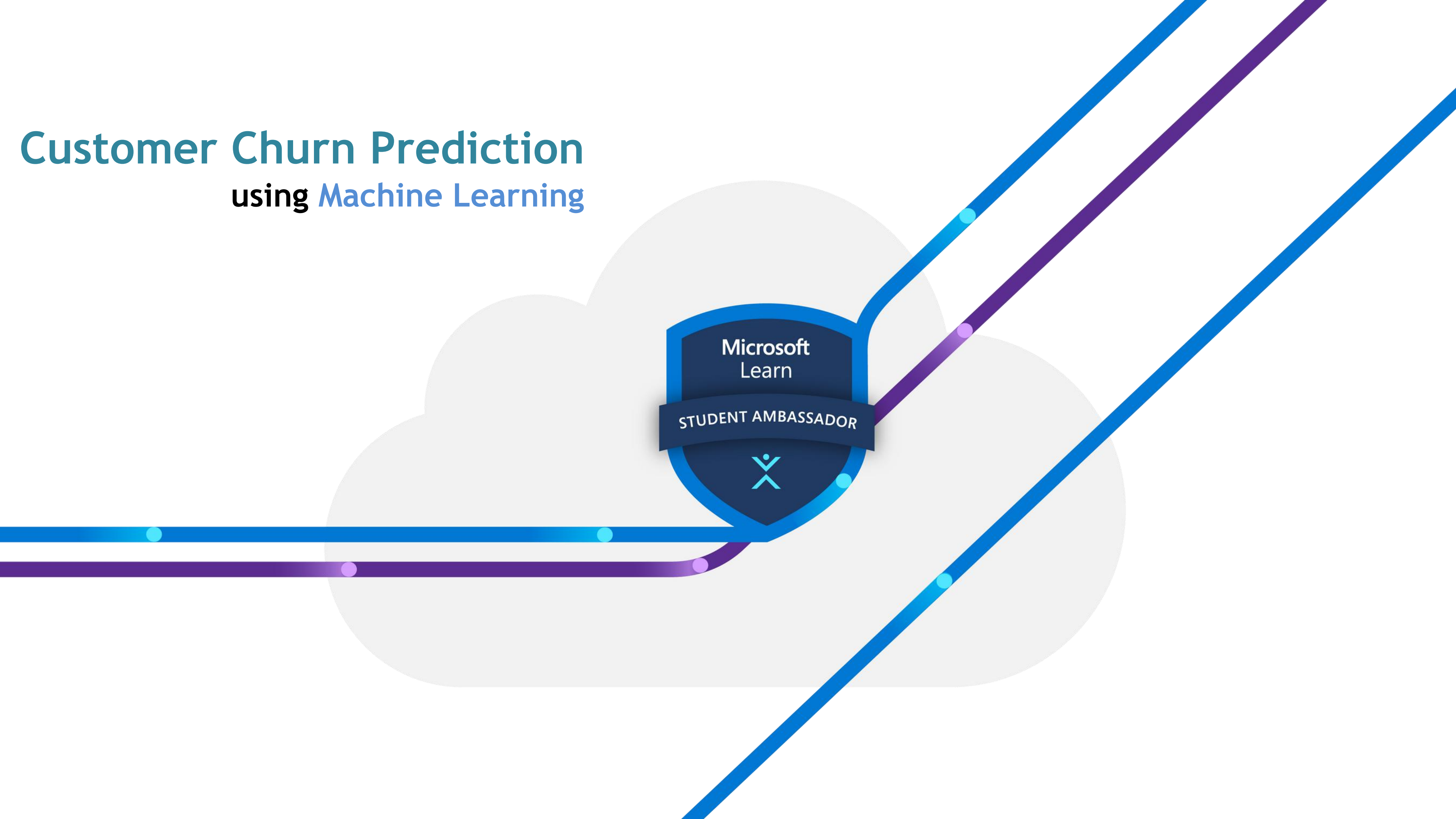


Customer Churn Prediction

using Machine Learning





What's the Problem..?



What is Customer Churn?

Churn happens when customers stop doing business with a company.

High churn = revenue loss

Goal: Predict and prevent churn using data and ML!



Dataset Overview

The background is a dark blue gradient. On the right side, there is a faint, light blue geometric pattern consisting of various shapes like squares, circles, and lines. Overlaid on this are several thick, stylized lines. A horizontal cyan line runs across the middle, with a small blue dot on it. Below it, a blue line runs horizontally, also with a small blue dot. To the right, a thick cyan line curves upwards and then downwards, with two blue dots on it. Another blue line follows a similar path, slightly offset from the cyan one, with two blue dots. The overall aesthetic is modern and tech-oriented.



Understanding the Features Used in Modeling



| Column | Description |
|---------------------|--|
| gender | Male / Female |
| SeniorCitizen | 1 = Yes, 0 = No |
| Partner, Dependents | Whether the customer has a partner or dependents |
| tenure | Number of months with the company |
| InternetService | DSL / Fiber optic / No |
| Contract | Contract type: Monthly / 1yr / 2yr |
| PaymentMethod | Electronic check, Bank transfer, etc. |
| TotalCharges | Total charges over time (float stored as string) |
| Churn (Target) | Yes = Customer left, No = Stayed |

Data Engineering

The background features a dark blue field with a faint, light blue geometric pattern of squares, circles, and lines. Overlaid on this are several thick, stylized lines. A horizontal cyan line runs across the lower third of the image, with a small blue dot on it. Below it is a solid blue line, also with a blue dot. To the right, a thick cyan line curves upwards and then diagonals towards the top right corner, with two blue dots on it. Another thick blue line follows a similar path, slightly offset from the cyan one, with a blue dot. The overall aesthetic is modern and technical.



Data Engineering



Preprocessing Steps

Handled missing/invalid values

Applied Label Encoding to categorical features

Created derived features like:

$\text{AvgChargesPerMonth} = \text{TotalCharges} / \text{Tenure}$

Modeling





Two models tested:



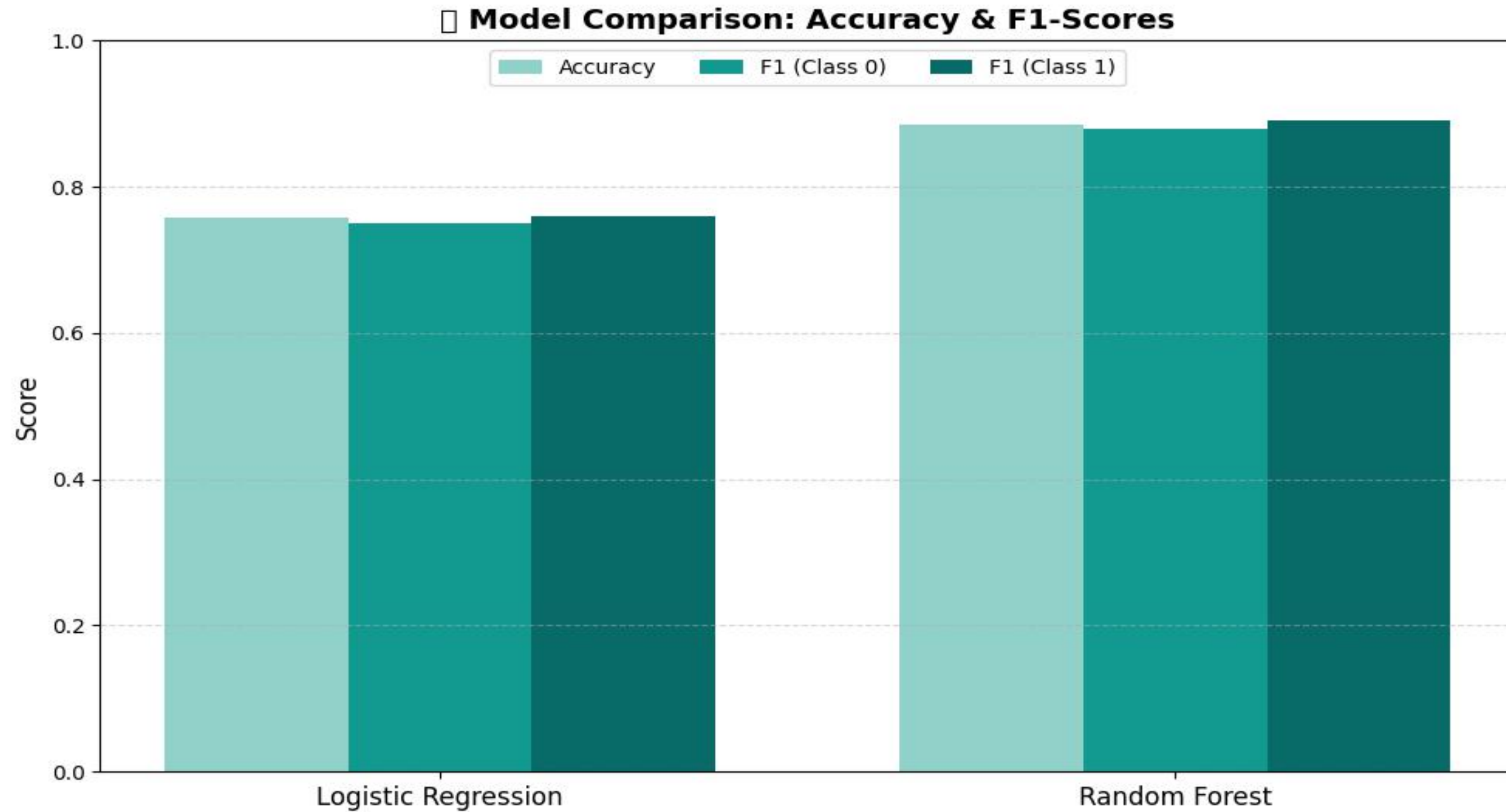
- Logistic Regression (baseline)
- Random Forest Classifier
- Used Scikit-learn with cross-validation
- Evaluated on Accuracy & F1-Score

Results Visualization

An abstract graphic on a dark blue background. It features several thick, flowing lines in shades of blue and cyan. One line starts horizontally from the left, then curves upwards and to the right. Another line starts horizontally below it, then curves downwards and to the right. A third line starts from the bottom left and curves sharply upwards and to the right. Small dots of the same colors are placed at various points along these lines. The background is covered with a faint, light blue geometric pattern consisting of squares, circles, and lines.





Model Performance



Flask Web App

The background features a dark blue gradient with abstract, flowing lines in shades of blue and cyan. These lines originate from the bottom left and curve upwards and to the right, creating a sense of movement and depth. Small, solid blue and cyan dots are placed along these lines, acting as markers or data points. The overall aesthetic is modern and tech-oriented.



**Microsoft Learn Student Ambassador**

Customer Churn Prediction System

Basic Information

Gender:
Male

Tenure (months):
12

Subscribed Services

Internet Service:
DSL

Online Backup:
Disabled

Tech Support:
Not Available

Contract Type:
Monthly

Payment Information

Payment Method:
Electronic Check

Monthly Charges (\$):
50.00

Total Charges (\$):

AvgChargesPerMonth:

Predict

✓

Result: Customer Will Stay

Confidence: %

No Churn

Real Business
Value

The image features a dark blue background with a faint, repeating geometric pattern of squares, circles, and lines. Two prominent lines, one cyan and one blue, run horizontally across the lower half of the image. The cyan line is positioned slightly above the blue line. Both lines have small dots of their respective colors placed at intervals. On the right side, the lines curve upwards and then downwards, creating a dynamic, flowing shape. The text 'Real Business Value' is written in a clean, white, sans-serif font on the left side of the image.



Why does this matter?



- Companies can identify high-risk customers
- Take action early: offers, discounts, support
- Reduce churn = Increase revenue

What's Next..?

The background is a dark blue gradient. It features a faint, repeating geometric pattern of squares, circles, and lines. Overlaid on this are several thick, stylized lines. A horizontal cyan line runs across the lower third of the image, with a small dark blue dot on it. Below it is a horizontal blue line, also with a small dark blue dot. On the right side, two lines curve upwards and outwards: a cyan line that curves from the horizontal line and a blue line that curves from the lower horizontal line. Both of these curved lines have small dark blue dots on them. The text 'What's Next..?' is positioned on the left side, centered vertically between the horizontal lines.



Future Enhancements



- Add more advanced models (e.g., XGBoost, LSTM)
- Integrate sentiment analysis of support chats like this project i have worked on <https://nlp.pixion.tech/>
- Connect to live CRM data

The background is a dark blue gradient. It features several thick, flowing lines in shades of blue and cyan. One line starts horizontally from the left, curves upwards, and then diagonally towards the top right. Another line starts horizontally, curves downwards, and then diagonally towards the bottom right. These lines intersect and overlap. Small, solid blue and cyan dots are placed at various points along these lines. In the bottom right corner, there is a faint, light blue geometric pattern consisting of a grid of squares and circles, some of which are connected by thin lines, resembling a circuit board or a network diagram.

Thank You
Microsoft Learn Student Club