



# Exploring Customer Churn:

Patterns, prediction and prevention

By: Rajashree Hajare

# PROJECT OUTLINE

- **SKYLINE COMM** is a leading European telecommunications company est. six years ago with a mission to transform connectivity across the continent. The company operates an extensive LTE network with comprehensive coverage across all major regions, ensuring seamless connectivity for millions of customers.
- Problem statement defined is **curb churn of customers** because it is more expensive to acquire a new customer than to keep your existing once leaving

# BUSINESS CASE

- Monitor churn rate over time
  - Track percentage of customers who cancel subscription over time period
- Analyse customer profile those who churn
  - Identify the key attributes and customer behaviours that lead discontinuation of service
  - Clustering based on these characteristics
- Identify Key Features for Churn Predicted by the Model
  - Determine the primary drivers of churn as identified by the predictive model.
  - Understand likelihood of existing customers to churn.

# DATA INFO

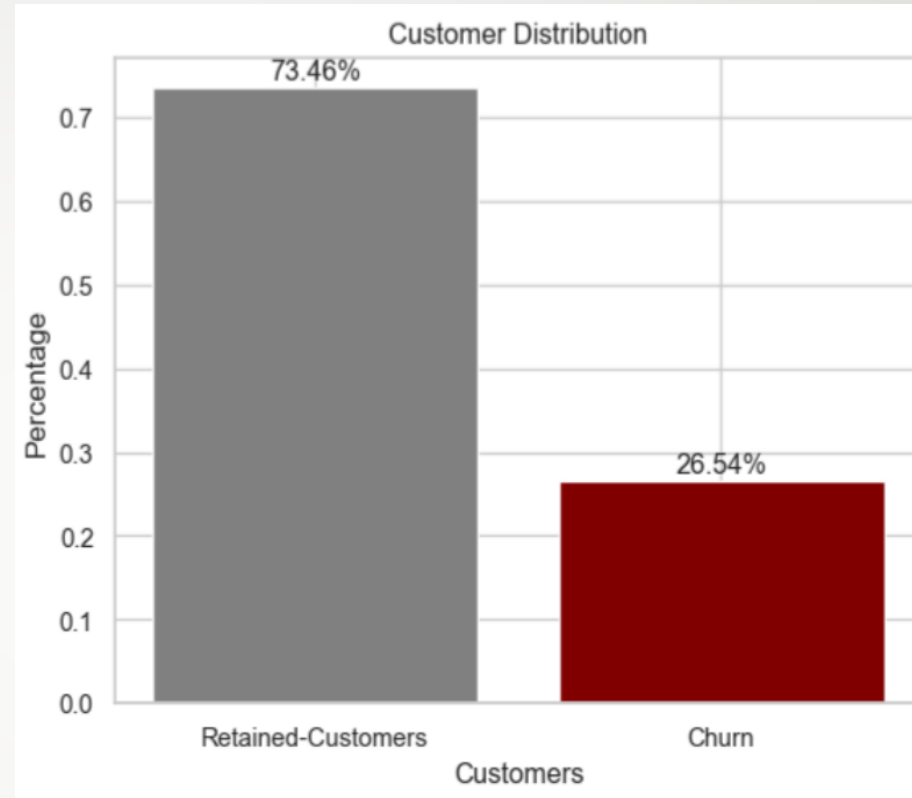
Source: IBM Sample dataset

- Demographics
  - Gender
  - Other: Senior citizen, partners, dependents
- Services
  - Phone lines: Multiple lines
  - Internet services: Online security, backup, device protection, Tech support , Streaming movies , Streaming TV
- Account type
  - Tenure
  - Contract type: monthly, 1-yr., 2-yr.
  - Paperless billing
  - Payment method : mailed check, electronic check, credit card (auto), bank transfer (auto)

Focus area: 1

## CHURN RATE

% of customers who cancel subscription



- 26.5% or nearly 1866 customers opted for other company services in span of 6 years



Focus area: 2

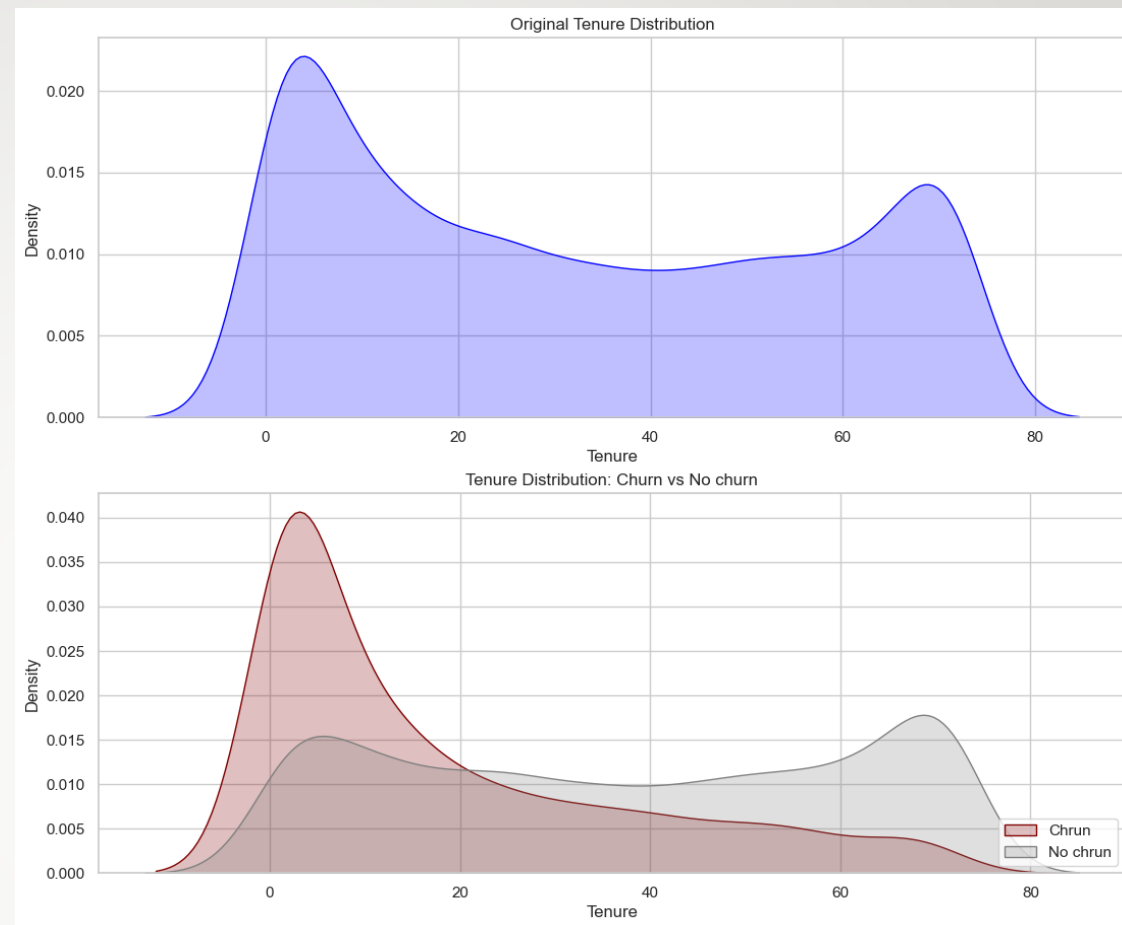
## CUSTOMER PROFILE ANALYSIS

Characteristics of customers who  
churn

- Demographics :
  - Are singles : No partners (64.2%) and dependents (82.5)
- Account information :
  - Monthly contract (82%)
  - opt **paperless billing** (74.9%) using **electronic check** (57.3%)
- Usage Services :
  - preferred **Fibre optic type Internet service**
  - W/o online Tech support, backup and security, Streaming TV, streaming movies

# CUSTOMER PROFILE ANALYSIS

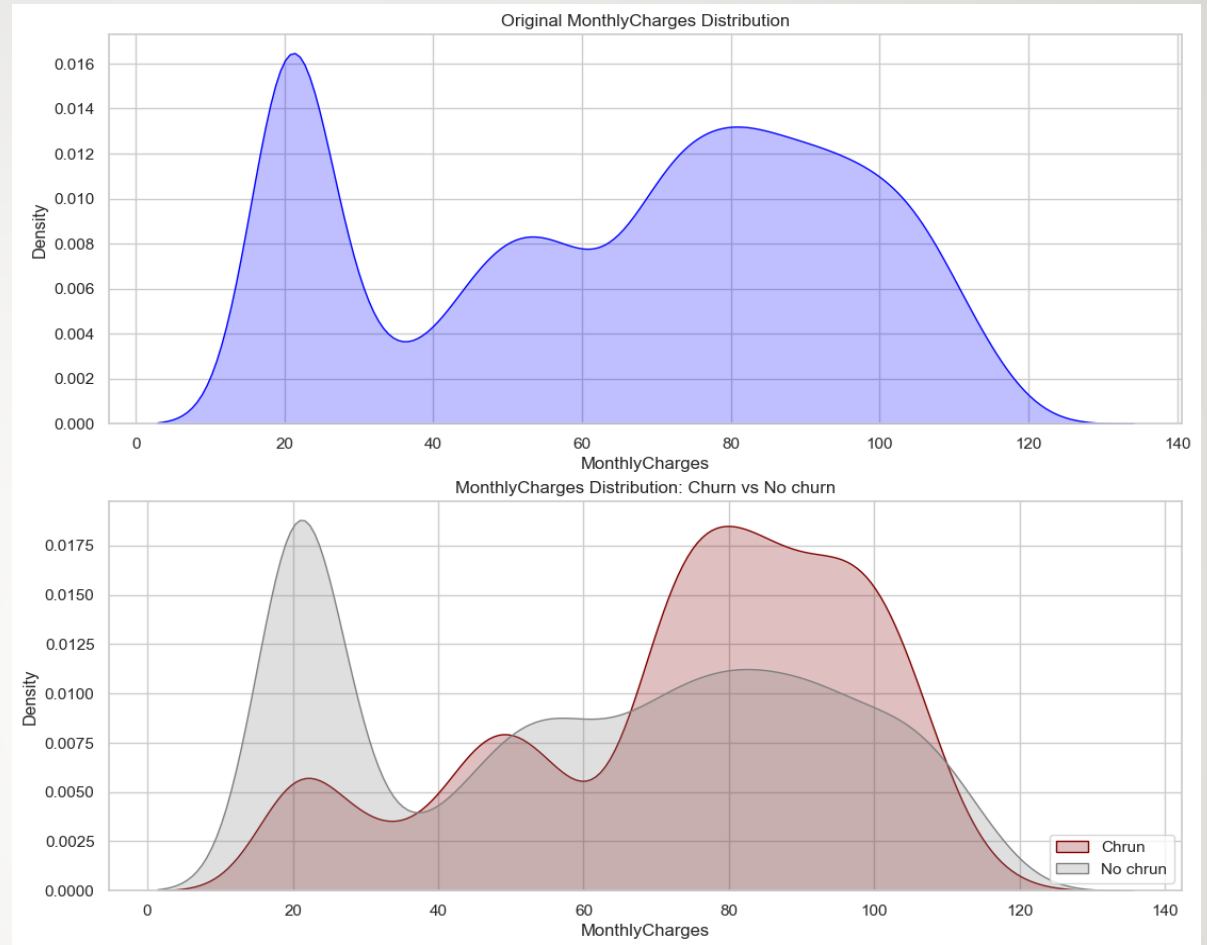
Tenure and Monthly charges  
distribution



- Churn customers have mainly  $< 12$  month contract

# CUSTOMER PROFILE ANALYSIS

Tenure and Monthly charges  
distribution



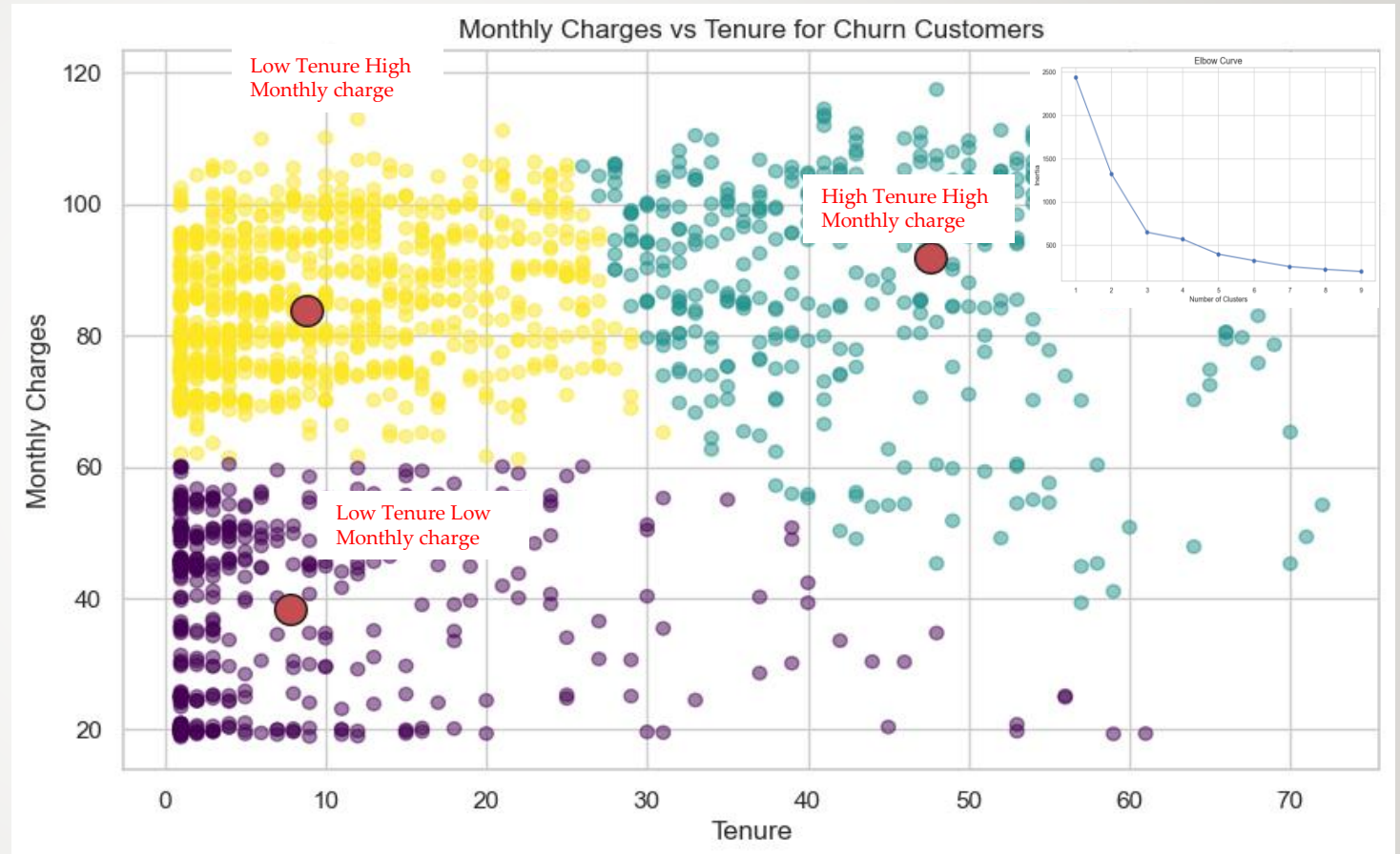
- Churn customers have monthly contract  $> \$65$  monthly



# CLUSTERING

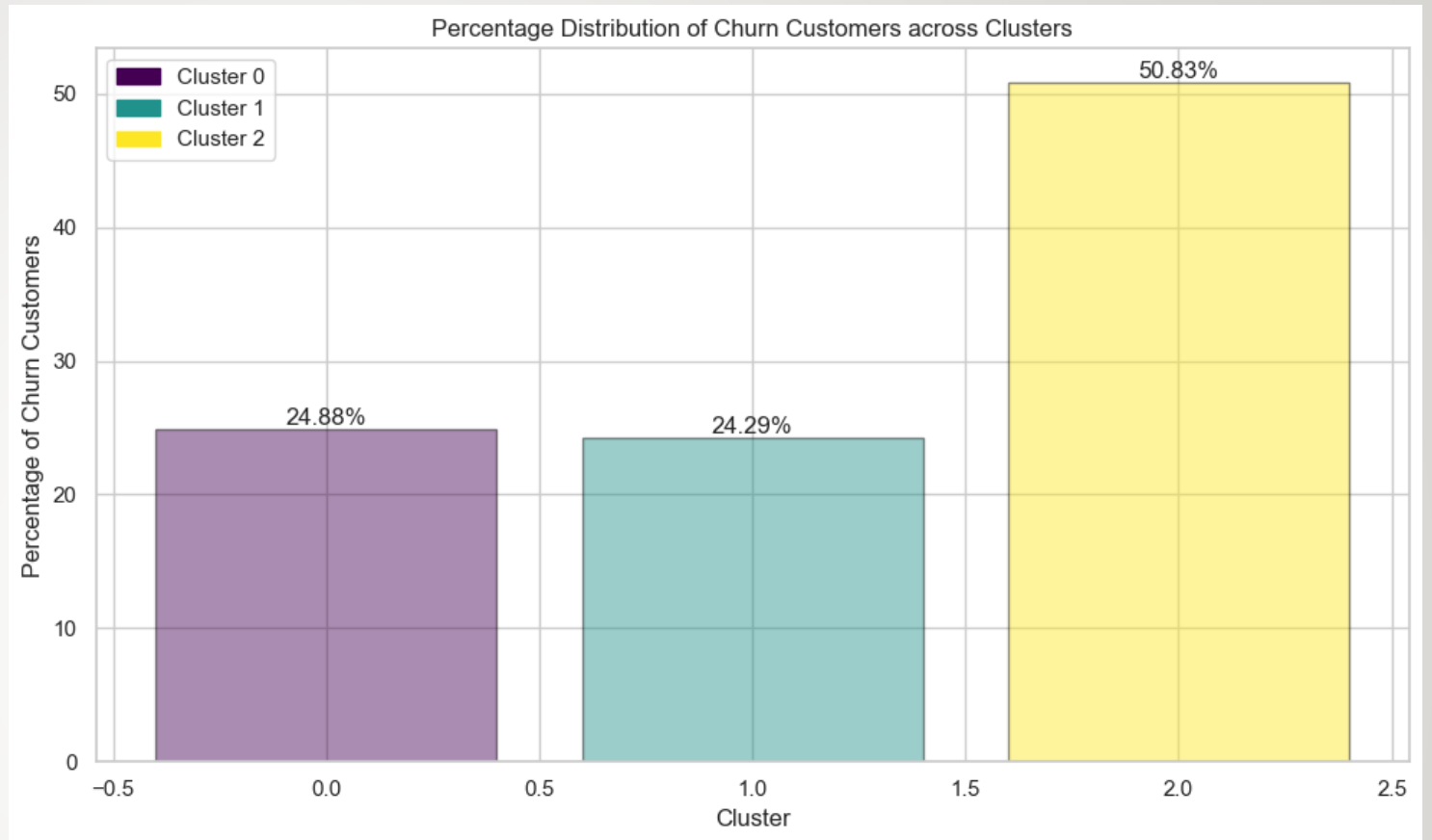
Monthly charges vs Tenure over customer churn

- K-means clustering to cluster customers
- Elbow method for ideal cluster determination



# CLUSTERING

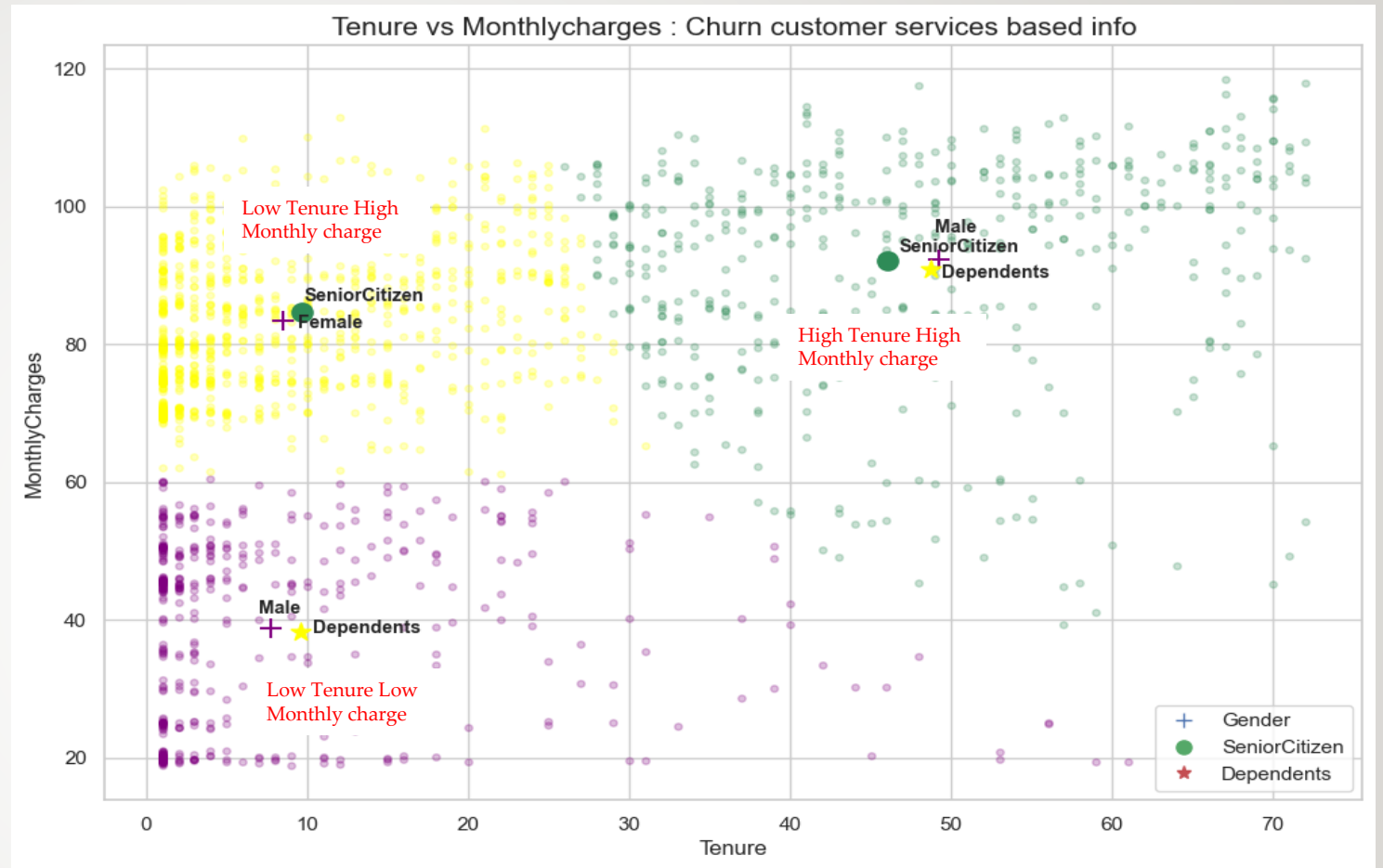
% of customers churn across clusters



- Nearly 50% customer churn belong to low tenure and high monthly charges group

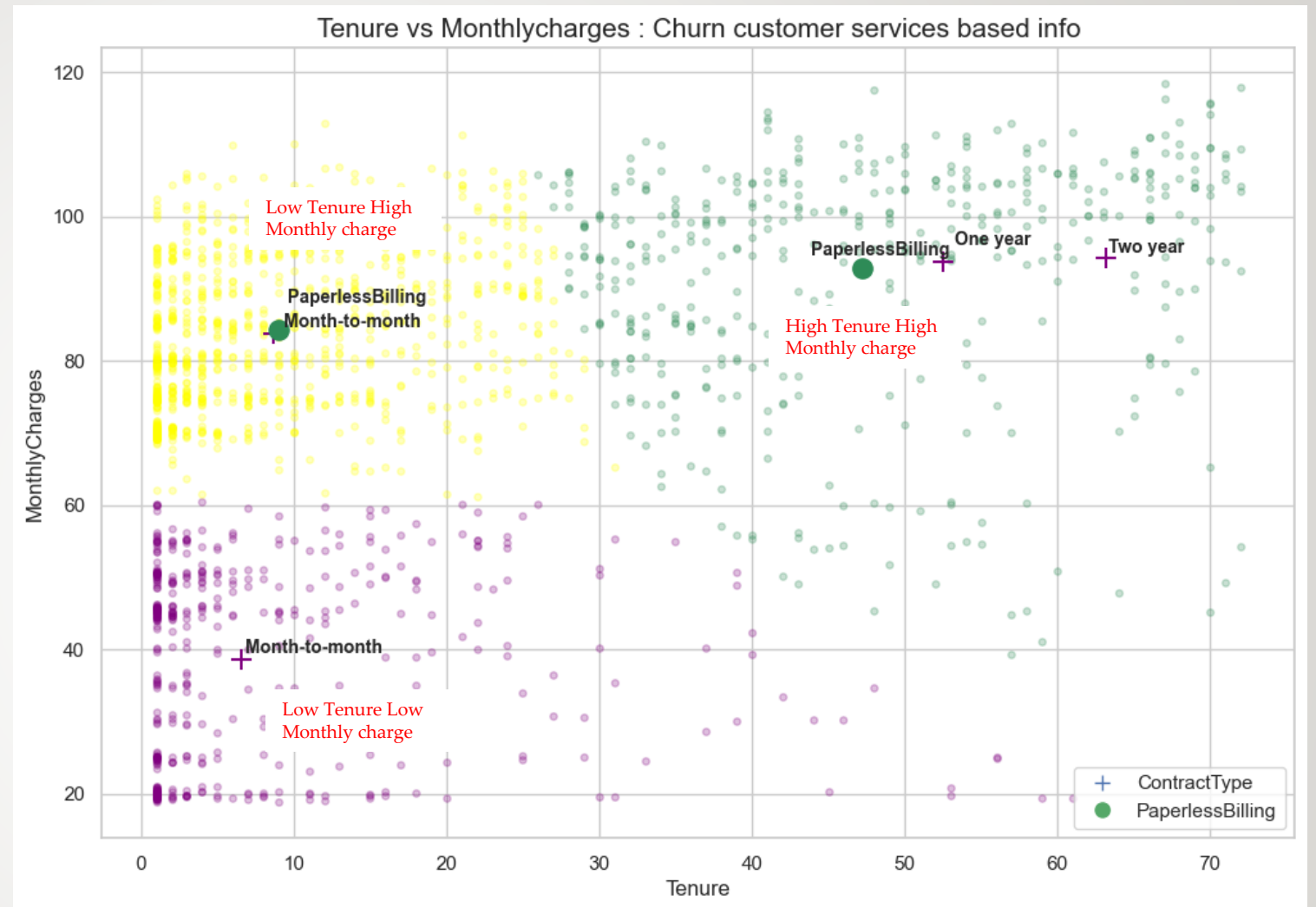
# CLUSTERING

based on demographics



# CLUSTERING

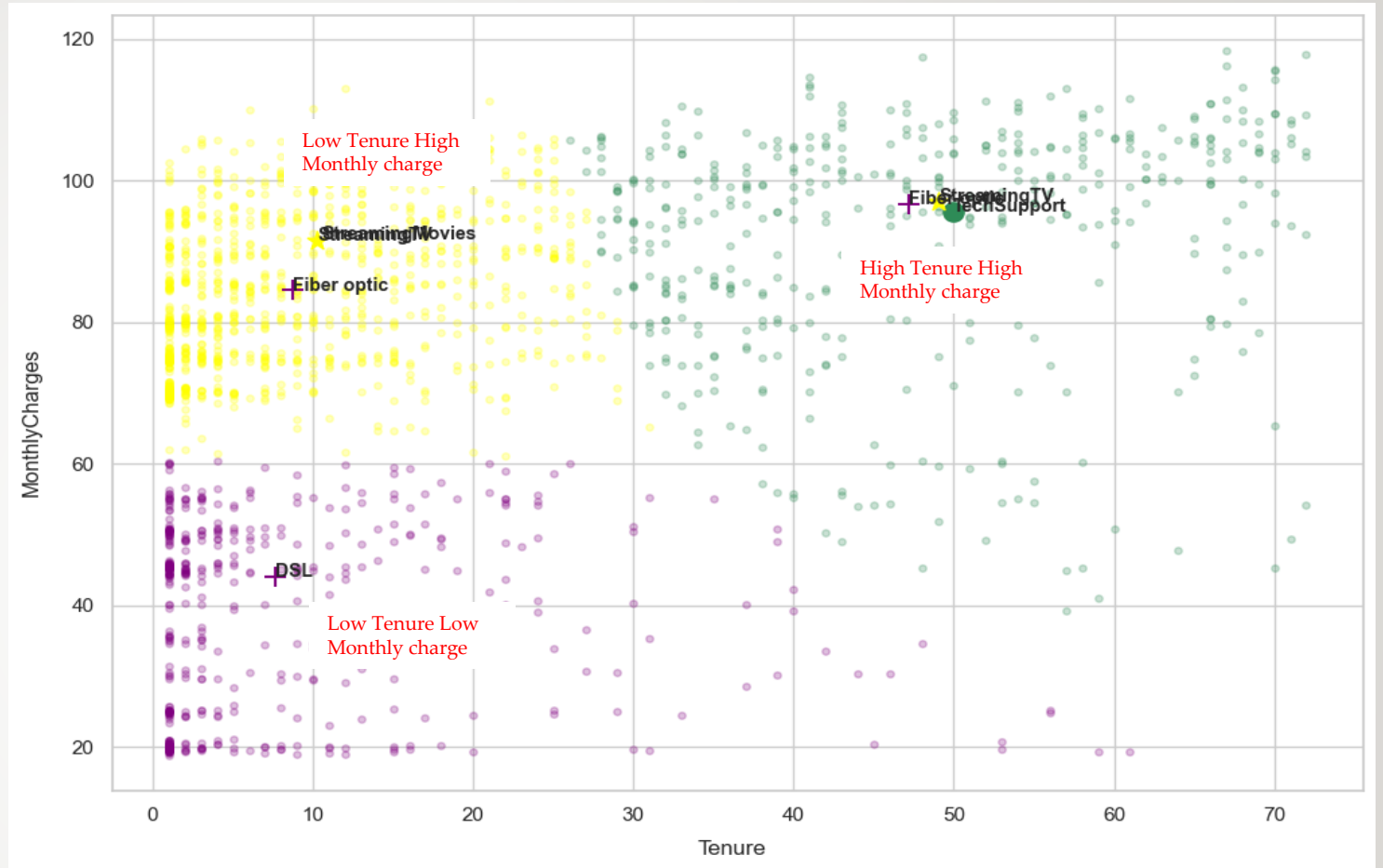
based on account info





# CLUSTERING

based on services





Focus area: 3

# MODEL PREDICTION

Identify key features

## CATEGORICAL DATA

- Data preprocessing
  - Train-test split
  - Class imbalance
- Model Selection
  - Gradient boosting
  - Logistic Regression
  - KNN
  - Random Forest
  - ADABooster

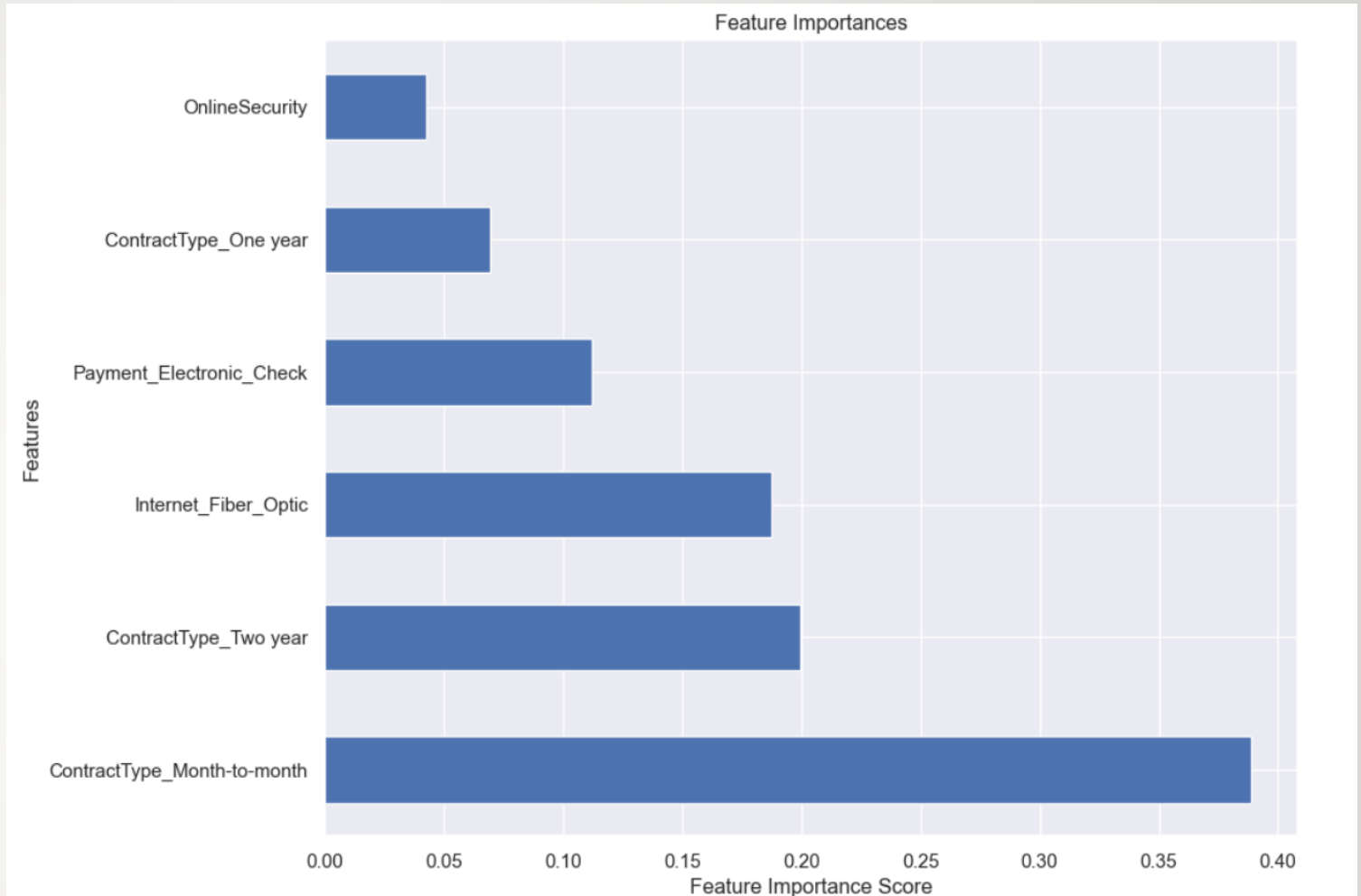
# MODEL PREDICTION

Identify key features

- Upon comparing the model performance:
  - Random forest was the best method among the selected models with **74% accuracy** (ROC AUC score: 0.743)
  - After several tries with **Grid search model**, estimated optimal “depth” is 7, and “n-estimators” is 100.

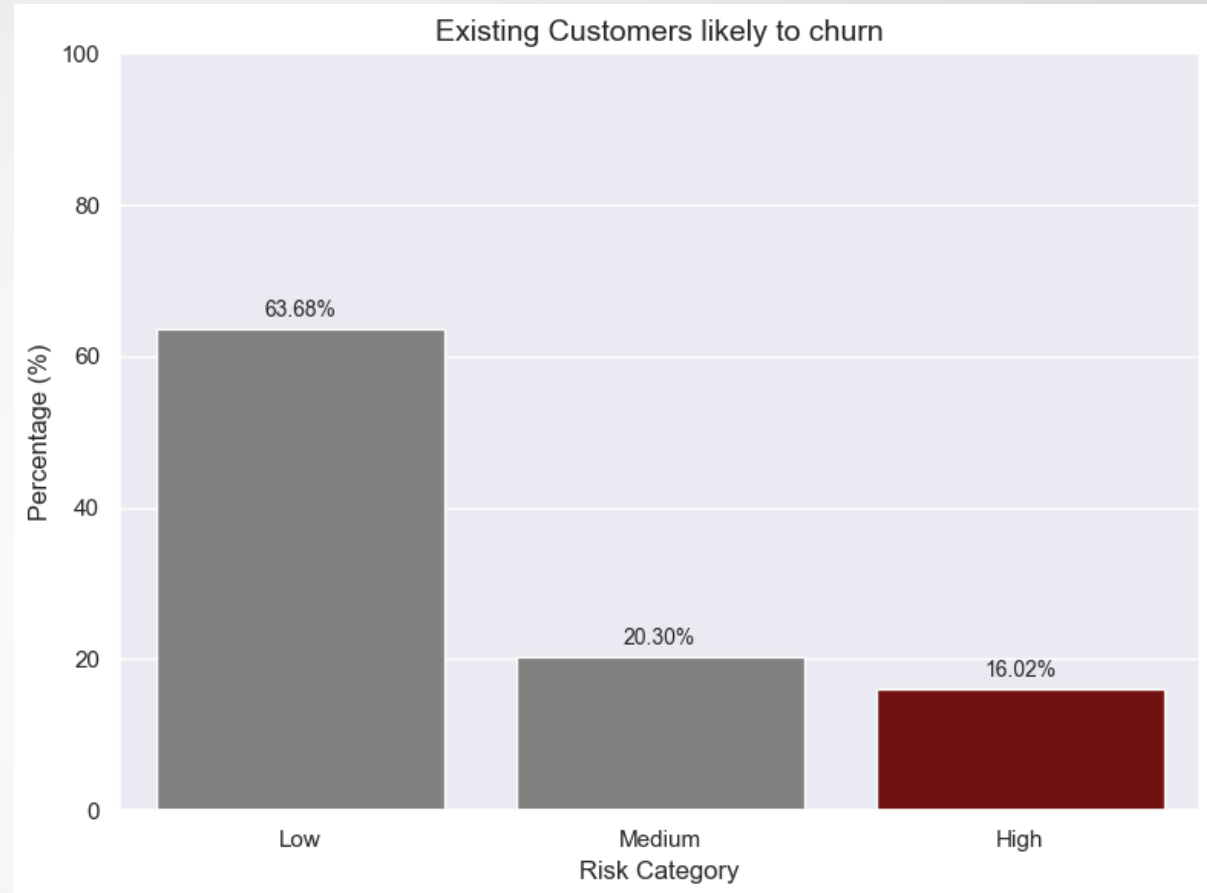
# MODEL PREDICTION

Identify key features



# MODEL PREDICTION

Likelihood of existing customers  
to churn



- Focus strategies on retain 16% of existing customers from churn

# CONCLUSION

How can the company prevent customer churn in coming year

- Promote retention strategies
  - Customise personalized plan for singles to enhance retention.
  - Review pricing strategies to match perceived value for customers paying high monthly charges for low tenure period.
- Focus on Service Enhancement
  - Continuously improve optic fibre internet service reliability and speed.
  - Ensure consistent service quality to meet customer expectations.





THANK YOU.