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Course Content

Bank Churn Prediction - Problem Statement

Submission type	:	File Upload
Due Date	:	Jul 20, 4:30 AM MST
Total Marks	:	60
Available from	:	Jun 20, 7:30 AM

Description

Problem Statement

Background and Context

Businesses like banks that provide service have to worry about the problem of 'Churn' i.e. customers leaving and joining another service provider. It is important to understand which aspects of the service influence a customer's decision in this regard. Management can concentrate efforts on the improvement of service, keeping in mind these priorities.

Objective

Given a Bank customer, build a neural network-based classifier that can determine whether they will leave or not in the next 6 months.

Data Description

The case study is from an open-source dataset from Kaggle. The dataset contains 10,000 sample points with 14 distinct features such as CustomerId, CreditScore, Geography, Gender, Age, Tenure, Balance, etc.

- **CustomerId:** Unique ID which is assigned to each customer
- **Surname:** Last name of the customer

- **CreditScore:** It defines the credit history of the customer.
- **Geography:** A customer's location
- **Gender:** It defines the Gender of the customer
- **Age:** Age of the customer
- **Tenure:** Number of years for which the customer has been with the bank
- **NumOfProducts:** It refers to
  the number of products that a customer has purchased through the bank.
- **Balance:** Account balance
- **HasCrCard:** It is a categorical variable that decides whether the customer has a credit card or not.
- **EstimatedSalary:** Estimated salary
- **isActiveMember:** It is a categorical variable that decides whether the customer is an active member of the bank or not (Active member in the sense, using bank products r egularly, making transactions, etc)
- **Exited:** It is a categorical variable that decides whether
  the customer left the bank within six months or not. It can take two values
  - 0=No (Customer did not leave the bank)
  - 1=Yes (Customer left the bank)

Submission Guidelines :

1. There are two ways to work on this project:

i. Full-code way: The full code way is to write the solution code from scratch and only submit a final Jupyter notebook with all the insights and observations.

ii. Low-code way. The low-code way is to use an existing solution notebook template to build the solution and then submit a business presentation with insights and recommendations.

The primary purpose of providing these two options is to allow learners to opt for the approach that aligns with their individual learning aspirations and outcomes. The below

table elaborates on these two options.

Submission type	Who should choose	What is the same across the two	What is different across the two	Final submission file [IMP]	Submission Format
Full-code	Learners who aspire to be in hands-on coding roles in the future focussed on building solution codes from scratch	Perform exploratory data analysis to identify insights and recommendations for the problem	Focus on code writing: 10-20% grading on the quality of the final code submitted	Solution notebook from the full-code template submitted in .html format	.html
Low-code	Learners who aspire to be in managerial roles in the future-focussed on solution review, interpretation, recommendations, and communicating with business		Focus on business presentation: 10-20% grading on the quality of the final business presentation submitted	Business presentation in .pdf format with problem definition, insights, and recommendations	.pdf

Please follow the below steps to complete the assessment. Kindly note that if you submit a presentation, ONLY the presentation will be evaluated. Please make sure that all the

sections mentioned in the rubric have been covered in your submission.

i. Full-code version

- Download the full-code version of the learner notebook.
- Follow the instructions provided in the notebook to complete the project.
- Clearly write down insights and recommendations for the business problems in the comments.
- Submit only the solution notebook prepared from the learner notebook [format: .html]

ii. Low-code version

- Download the low-code version of the learner notebook.
- Follow the instructions provided in the notebook to complete the project.
- Prepare a business presentation with insights and recommendations for the business problem.
- Submit only the presentation [format: .pdf]

2. Any assignment found copied/plagiarized with other submissions will not be graded and awarded zero marks.

3. Please ensure timely submission as any submission post-deadline will not be accepted for evaluation.

4. Submission will not be evaluated-

- If it is submitted post-deadline, or,
- If more than 1 file is submitted.

Best Practices for Full-code submissions

- The final notebook should be well-documented, with inline comments explaining the functionality of code and markdown cells containing comments on the observations and insights.

- The notebook should be run from start to finish in a sequential manner before submission.
- It is important to remove all warnings and errors before submission.
- The notebook should be submitted as an HTML file (.html) and NOT as a notebook file (.ipynb).
- Please refer to the FAQ page for common project-related queries.

Best Practices for Low-code submissions

- The presentation should be made keeping in mind that the audience will be the Data Science lead of a company.
- The key points in the presentation should be the following:
  - Business Overview of the problem and solution approach
  - Key findings and insights which can drive business decisions
  - Business recommendations
  - Focus on explaining the key takeaways in an easy-to-understand manner.
  - The inclusion of the potential benefits of implementing the solution will give you the edge.
- Copying and pasting from the notebook is not a good idea, and it is better to avoid showing codes unless they are the focal point of your presentation.
- The presentation should be submitted as a PDF file (.pdf) and NOT as a .pptx file.
- Please refer to the FAQ page for common project-related queries.

Happy Learning!

Scoring guide (Rubric) - Bank-Churn Prediction (1)

Criteria	Points
Define the problem and perform an Exploratory Data Analysis - Define problem statement - Data Overview - Removing features with only unique values - Univariate analysis - Bivariate analysis - Observations and Insights from EDA	12
Data Pre-processing - Split the target variable and predictors - Split the data into train and test - Normalize the data - Categorical Encoding	7
Model Building - Choose the metric of choice with proper rationale - Train a Neural Network model with SGD as an optimizer - Comment on model performance	5
Model Performance Improvement and Final Model Selection - Use different methods mentioned below to improve the model performance - Build a model with Adam optimizer - Build a model with Adam optimizer and Dropout - Build a model with balanced data by applying SMOTE and SGD optimizer - Build a model with balanced data by applying SMOTE and Adam optimizer - Build a model with balanced data by applying SMOTE, Adam optimizer and Dropout - Comment on model performance for each of the models - Choose the best model from the ones built with proper reasoning.	22
Actionable Insights & Recommendations Conclude with the key takeaways for the business	6
Presentation/Notebook - Overall quality - Structure and flow - Crispness - Visual appeal - Conclusion and Business Recommendations OR - Structure and flow - Well	8

Criteria	Points
commented code - Conclusion and Business Recommendations	
	Points 60

AI Mentor

Chat with AI Mentor to get instant answers to your queries related to this assignment.

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