B2B Sales Predictive Model

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1 Project Overview

This project involves building a predictive model to estimate monthly sales and classify leads into sales tiers for B2B e-commerce lead generation. The model aims to:

- Predict Monthly Sales: Provide accurate estimates for sales prioritization.
- Classify Sales Tiers: Segment leads into meaningful tiers for tailored strategies.
- Generalize to Non-Customers: Apply the model to potential leads.
- Provide Actionable Insights: Identify key factors influencing sales.

2 Folder Structure

The repository is organized as follows:

```
|-- modeling.py
   |-- evaluation.py
|-- reports/
   -- presentation.pdf
                           # Final presentation
|-- venv/
                           # Virtual environment directory (not tracked by Git)
-- requirements.txt
                           # Python dependencies
-- setup.sh
                           # Bash script for automated setup
                           # This README file in LaTeX format
|-- README.tex
|-- .gitignore
|-- LICENSE
                           # Optional
```

3 Prerequisites

• Operating System: macOS

• Python Version: Python 3.6 or higher installed on your system

4 Setup Instructions

4.1 Clone the Repository

Open your terminal and clone the repository:

```
git clone https://github.com/yourusername/b2b-sales-predictive-model.git cd b2b-sales-predictive-model
```

Note: Replace https://github.com/yourusername/b2b-sales-predictive-model.git with the actual URL of your GitHub repository.

4.2 Create and Activate the Virtual Environment

Create a Python virtual environment using venv:

```
python3 -m venv venv
```

Activate the virtual environment:

source venv/bin/activate

4.3 Install Dependencies

Upgrade pip and install the required packages:

```
pip install --upgrade pip
pip install -r requirements.txt
```

4.4 Set Up Jupyter Kernel

Add the virtual environment as a Jupyter kernel:

```
python -m ipykernel install --user --name=b2b-sales-env
```

4.5 Launch Jupyter Notebook

Start the Jupyter Notebook server:

jupyter notebook

When you open a notebook, select the kernel named b2b-sales-env:

• Navigate to Kernel \rightarrow Change kernel \rightarrow b2b-sales-env

5 Usage

With the environment set up, you can proceed to:

- 1. Data Exploration: Open notebooks/01_data_exploration.ipynb to explore the data.
- 2. Data Preprocessing: Use notebooks/02_data_preprocessing.ipynb to clean and preprocess the data.
- 3. Modeling: Build predictive models in notebooks/03_modeling.ipynb.
- 4. Evaluation: Evaluate model performance in notebooks/04_evaluation.ipynb.
- 5. Insights: Analyze feature importance and derive insights in notebooks/05_insights.ipynb.

6 Bash Script for Automated Setup

To automate the setup process, you can run the provided setup.sh bash script. This script will:

- Create the required folder structure
- Create and activate the virtual environment
- Install dependencies
- Set up the Jupyter kernel

6.1 Running the Script

Make sure you have execution permissions and then run the script:

```
chmod +x setup.sh
./setup.sh
```

6.2 setup.sh Contents

```
Listing 1: setup.sh
\#!/bin/bash
# Navigate to the project directory
cd "$(dirname-"$0")"
echo "Creating folder structure ..."
# Create folders
mkdir -p data/raw data/processed notebooks scripts reports
# Create notebook files
touch notebooks/01_data_exploration.ipynb \
      notebooks/02_data_preprocessing.ipynb \
      notebooks/03_modeling.ipynb \
      notebooks/04_evaluation.ipynb \
      notebooks/05_insights.ipynb
# Create script files
touch scripts/data_preprocessing.py \
      scripts/modeling.py \
      scripts/evaluation.py
# Create other files
touch requirements.txt LICENSE
echo "Adding-content-to-requirements.txt..."
# Add content to requirements.txt
cat > requirements.txt << EOL
pandas
numpy
scikit-learn
matplotlib
seaborn
jupyter
ipykernel
xgboost
lightgbm
shap
EOL
echo "Configuring - . gitignore . . . "
```

```
\# Create . gitignore if it doesn't exist
if [!-f.gitignore]; then
    cat > .gitignore << EOL</pre>
# Ignore data files
/data/raw/
/data/processed/
# Ignore virtual environment folder
venv/
# Ignore Jupyter Notebook checkpoints
. ipynb\_checkpoints \\
# Ignore system files
.DS_{-}Store
EOL
fi
echo "Initializing git repository ..."
# Initialize git repository if not already initialized
if [!-d.git]; then
    git init
    git add .
    git commit -m "Initial commit with folder structure and basic files"
fi
echo "Setting up virtual environment..."
# Create virtual environment and activate it
python3 —m venv venv
source venv/bin/activate
echo "Upgrading pip and installing dependencies..."
# Upgrade pip
pip install —upgrade pip
# Install dependencies
pip install -r requirements.txt
echo "Registering - Jupyter - kernel ..."
# Register the virtual environment kernel for Jupyter
python -m ipykernel install —user —name=b2b-sales-env
```

echo "Setup complete. You can now launch Jupyter Notebook using 'jupyter notebook

Deactivate virtual environment after setup deactivate

7 License

This project is licensed under the MIT License – see the LICENSE file for details.

8 Troubleshooting

8.1 Permission Denied Error When Running setup.sh

Ensure the script has execute permissions:

chmod +x setup.sh

8.2 Jupyter Kernel Not Showing Up

If the b2b-sales-env kernel doesn't appear in Jupyter Notebook, try reinstalling the kernel:

python -m ipykernel install --user --name=b2b-sales-env --display-name "Python (b2b-sales-env

8.3 Python Version Issues

Make sure you're using the correct version of Python. Check your Python version with:

python3 --version

8.4 Deactivating the Virtual Environment

When you're done working, deactivate the virtual environment:

deactivate

8.5 Reactivating the Virtual Environment

Before starting work in a new terminal session:

source venv/bin/activate

8.6 Installing Additional Packages

If you need to install new packages, make sure the virtual environment is activated and then install the package:

```
pip install package_name
    Update the requirements.txt file:
pip freeze > requirements.txt
```

9 Conclusion

You now have a complete guide and a bash script to set up the project environment on a Mac. This setup ensures that anyone can replicate the environment and run the project seamlessly.

Feel free to reach out if you have any questions or need further assistance.