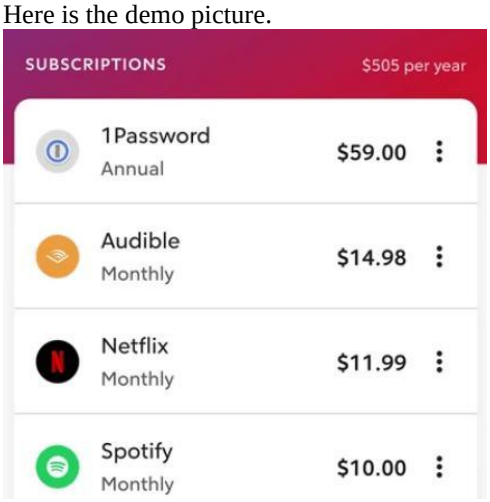
Data scientist Intern at Fiserv

06/2023 – 08/2023

The goal is to detect recurring (subscriptions) using transaction history (21 million) from CardHub (digital wallet App), which serves over 3 million customers across 1,000+ financial institutions.

Here is the demo picture.

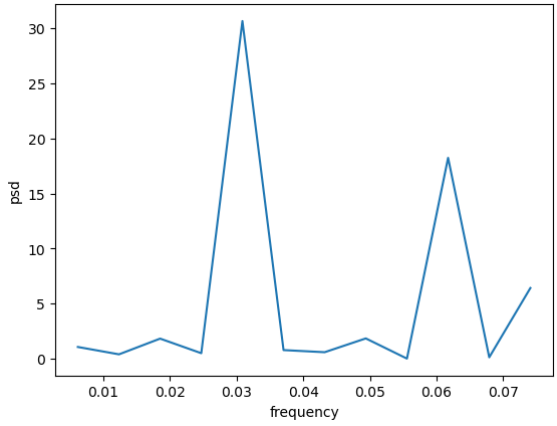


Here is an example of recurring transaction series. Each transaction series shares the same card_id, merchant_name and mcc(merchant category code).

AMOUNT	MERCHANT_NAME	TRANSACTION_TIME
-9.99	help.hbomax.com	2022-01-02
-9.99	help.hbomax.com	2022-02-02
-9.99	help.hbomax.com	2022-03-02
-9.99	help.hbomax.com	2022-04-02
-9.99	help.hbomax.com	2022-05-02
-9.99	help.hbomax.com	2022-06-02

Applied Discrete Fourier Transform and hypothesis testing to uncover recurring patterns in transaction series.

Here is the plot of periodogram from discrete Fourier transform. The spike indicates this series is recurring. And the corresponding frequency indicates the period of this recurring series. Here frequency is 1/30 and period is 30 days.



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Accurately estimated periods, amounts, and next due dates for predicted recurrings.

Improved model performance F1 score by 25% on manually labeled test set.