

Author Contributions Checklist Form

This form documents the artifacts associated with the article (i.e., the data and code supporting the computational findings) and describes how to reproduce the findings.

Part 1: Data

☐ This paper **does not** involve analysis of external data (i.e., no data are used or the only data are generated by the authors via simulation in their code).

☒ I certify that the author(s) of the manuscript have legitimate access to and permission to use the data used in this manuscript.

Abstract

The dataset includes information about all approved loan applications from July 2002 through November 2004. This consists of 208,085 records of which 45,787 (22%) have resulted in loans. Because loan offers expired in 45 days, the “fate” of unused loans approved in the final 45 days of the data is unknown.

Availability

- ☒ Data **are** publicly available
☐ Data **cannot be made** publicly available

If the data are publicly available, see the *Publicly available data* section. Otherwise, see the *Non-publicly available data* section, below.

Publicly available data

- ☐ Data are available online at:
☐ Data are available as part of the paper’s supplementary material.
☒ Data are publicly available by request, following the process described here:

See <https://www8.gsb.columbia.edu/cprm/research/datasets> and https://www8.gsb.columbia.edu/cprm/sites/cprm/files/files/On-Line_Auto_Lending-Description1%281%29.pdf for more details.

☐ Data are or will be made available through some other mechanism, described here:

Non-publicly available data

Discussion of lack of publicly available data:

Description

File format(s)

- ☒ CSV or other plain text:
- ☐ Software-specific binary format (.Rda, Python pickle, etc.):
- ☐ Standardized binary format (e.g., netCDF, HDF5, etc.):
- ☐ Other (described here):

Data dictionary

- ☐ Provided by the authors in the following file(s):
- ☐ Data file(s) is (are) self-describing (e.g., netCDF files)
- ☒ Available at the following URL:

https://github.com/oeqpqu/dynamic_pricing/tree/main/regret_compare

Additional information (optional)

Part 2: Code

Abstract

It contains the codes for our methodology on our mentioned experimental results in the paper.

Description

Code format(s)

- ☒ Script files
 - ☐ R ☒ Python ☐ Matlab
 - ☐ Other:
- ☐ Package
 - ☐ R ☐ Python ☐ MATLAB toolbox
 - ☐ Other:
- ☐ Reproducible report
 - ☐ R Markdown ☐ Jupyter notebook
 - ☐ Other:
- ☐ Shell script
- ☐ Other (described here):

Supporting software requirements

Version of primary software used

Python 3.7

Libraries and dependencies used by the code

Numpy 1.21.5, Pandas 1.4.2, matplotlib 3.5.2, scipy 1.6.0, seaborn 9.1 in Python

Supporting system/hardware requirements (optional)

Parallelization used

- ☒ No parallel code used
- ☐ Multi-core parallelization on a single machine/node
Number of cores used:
- ☐ Multi-machine/multi-node parallelization
Number of nodes and cores used:

License

- ☒ MIT License (default)
- ☐ BSD
- ☐ GPL v3.0
- ☐ Creative Commons
- ☐ Other (described here):

Additional information (optional)

Part 3: Reproducibility workflow

Scope

The provided workflow reproduces:

- ☐ Any numbers provided in text in the paper
- ☒ The computational method(s) presented in the paper (i.e., code is provided that implements the method(s))
- ☐ All tables and figures in the paper
- ☐ Selected tables and figures in the paper, as explained and justified here:

Workflow details

Format(s)

- ☐ Single master code file
- ☐ Wrapper (shell) script(s)
- ☐ Self-contained R Markdown file, Jupyter notebook, or other literate programming approach
- ☐ Text file (e.g., a readme-style file) that documents workflow
- ☐ Makefile
- ☒ Other (more detail in 'Instructions' below)

Instructions

The 'regret_compute' folder contains the codes for computing our regret under different smoothness conditions. These files reproduce the results corresponding to Figure 1, Figure 7-8, Figure 9-Figure 11. If the file name contains "/indp/dp/mix-m2/m4/m6", they correspond to our indp/dp/mix settings(described on page 25 of our manuscript) with independent/dependent/strong-mixing entries with the degree of smoothness 2/4/6 respectively.

The 'regret_compare' folder contains the codes for comparing our method with respective to other methods. Corresponds to figure 2 and 3. To be more specific, the folder named 'Simulation' under 'regret_compare' contains codes for reproducing figure 2 with different degree of smoothness ($m=2/4/6$). The folder 'Real_data' contains our post processed data (.csv) and the performance of our algorithm compared to 'RMLP-2' and 'Bandit' algorithm respectively.

Expected run-time

Approximate time needed to reproduce the analyses on a standard desktop machine:

☐ <1 minute

☐ 1-10 minutes

☐ 10-60 minutes

☐ 1-8 hours

☒ >8 hours

☐ Not feasible to run on a desktop machine, as described here:

Additional documentation (optional)

Notes (optional)