# “Finance Manager” application for Azerbaijani local bank’s mobile banking system.

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## ABSTRACT
Our project is a Finance Manager application that can be used within Azerbaijani local bank’s mobile banking application. The application is aimed at the organization and distribution of monetary resources of the Bank’s users and their track-keeping. It provides monthly statistics of the user’s spending based on his/her performed transactions. As a result of our project, the number of customers of the Bank is expected to increase. And the first reason is that none of the local banks of Azerbaijan has implemented this feature in their mobile banking application and the Bank will be the first company in the market from this perspective. In addition, the use rate of Finance Manager by existing customers of the Bank’s mobile banking application should also rise in size.

## KEYWORDS
Object Oriented Programming, Machine Learning.

## INTRODUCTION
With the help of the Finance Manager application, it becomes much easier and faster to control the expenses and stick to the predefined budget avoiding any overflows. Our Finance Manager application is going to be integrated within the mobile banking application of Azerbaijan’s local bank. The main purpose of the Finance Manager project within the Bank’s application is to promote digital banking services of the Bank. The creation of a convenient system will contribute a lot to the enlargement of the user pool of the Bank.

## ENGINEERING STANDARDS
We made use of the OOP concept of Java. Additionally, we implemented Singleton, Adapter, Decorator, and Wrapper Software Design Patterns within our code. Moreover, we made use of an Observer, which is a component of Android Studio. It was responsible for checking the database for updates and for ensuring that the data is always up to date. We created our database with the use of the ROOM persistence library.

## PREDICTION
In our case, we used Financial forecasting as a process of estimating how much the user will spend in the upcoming month based on the values gained from the previous months and the categories to which these transactions are assigned to.[2] Therefore, we generated a specific data on which the algorithm will run. Multiple Linear Regression algorithm was used to predict the expense price for the next month, where expenses from the previous month and category id are independent values.
*Figure 1. Results of prediction.*

```
Category: 6
Previous month expense: 77
Predicted expense for the next month: ₼ 67.37
```

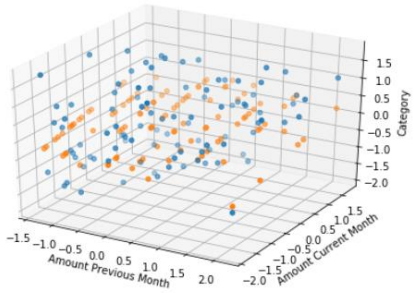


*Figure 2. column points(blue) with predicted values (orange).*

## CONCLUSION AND FUTURE STUDY
As a result of our work, we constructed an application that helps its users manage their finances by dividing their expenses on preferred categories and putting limits on those expenses. Additionally, we did research in ML and created predictions on user data. As a future work, we want to implement ML in it. We are planning to create other versions of it for the rest of the platforms. Our Finance Manager application will be integrated within the mobile banking application of the local Azerbaijani Bank. Improvement of ML and Data Analytics will be done by means of adding more valuable data in our files.

## REFERENCES
[1] Matteo Stefanel, Udayan Goyal (2017) Gamification of Financial Services: Current Trends and Future Possibilities.

[2] Victor Roman (Jan 20, 2019) Machine Learning Project: Predicting Boston House Prices with Regression.