# Task Management Application with Gamification Features

Repository link : <https://github.com/BenjaminBrehier/II.3510_2425_TaskList_G1_BMC>

## Introduction

This project revolves around a task management application with a gamified approach to enhance user engagement and productivity. The core idea is to help users organize their tasks, track progress, and motivate them to complete their tasks by offering rewards in the form of experience points (EXP) and badges. We use an integrated backend using Firebase for user authentication and Firestore for storing user data, tasks, and progress information.

### Key Features of the Application:

* User Authentication: Firebase Authentication is integrated to handle user registration, login, and secure access to their task data.
* Task Management: Users can create, view, and manage tasks. Tasks are categorized by tags, and users can mark tasks as complete or delete them as needed.
* Different views: There’s 3 major views in the app:
  + The profile, with user and badge completion information,
  + The home with the task management and the tasks not completed,
  + The history with all already completed tasks, that can be manage too.
* Gamification: Users earn experience points (EXP) upon completing tasks, which accumulate over time. Upon reaching certain EXP milestones, users can level up and receive badges to celebrate their progress.
* Real-Time Updates: The app integrates Firestore with the front in Java, that update the view with the response of the database to ensure real-time updates. When a task is completed, the user interface is updated to reflect the changes (level up, progress bar, new badges, task moved) and their progress is updated in the database.

### Technical Implementation

The application uses Firebase and Firestore as its backend to provide real-time data management and seamless user experiences. Here are the key technologies used:

* Firebase Authentication: Handles secure user authentication, including sign-up, login, and logout functionality. It ensures that each user's data is securely stored and accessible only by them.
* Firestore Database: Stores all the user's tasks, profile information, and gamification data (EXP, level, badges and badge progression). The database is queried in real-time, meaning any changes to tasks are instantly reflected in the app (for example deleting task or adding task will be seen in real-time in the view)

## Challenges Encountered

### Gamification Design and Badges assignment

One of the most challenging aspects of the project was the design and implementation of the gamification features, particularly the management of experience points (EXP) and badges.

The complexity lay in:

* EXP progress: Determining how much EXP a user should earn for each completed task and setting up a level-up system, all that can be updated in real-time.
* Badge Assignment: Assigning badges when users reach certain milestones. This required designing logic that would dynamically check a user’s progress and award badges based on specific criteria (e.g., completing 10 tasks with a certain tag)

## Conclusion

Despite the challenges, especially regarding the implementation of gamification features, the project has been a rewarding experience. We are particularly happy with the seamless integration of Firebase Authentication and Firestore Database, and all the logic gestion in JAVA with all the data stored in Firestore. The gamification aspect, with its badges and EXP progress, adds a motivational layer to task completion, encouraging users to stay organized and disciplined while having fun. This was our first experience working with a NoSQL database with an Android App in Java, and it turned out to be a positive learning opportunity.