

Tuition Scheduler @ MiUni

	С	Computer Science and
s		Engineering
	Ε	University of Puerto Rico Mayagüez Campus

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Problem Statement

At UPRM, students often spend over an hour finding a schedule for their courses every term. This is due to lacking features for conflict detection, schedule saving, and comprehensive search functionalities on the university platform. Our proposed mobile application, Tuition Scheduler, seeks to streamline this process by adding all these features and more.

Technical Approach

Our solution is launching under the MiUni app available on Android & IOS. It is built with Flutter to allow for easy multiplatform deployment and utilizes Google's Firebase as the backend.



Results

Our feature is available as "Matrical" within the MiUni app. When pressed, you are taken to a Course Select page to add your desired courses and section preferences. You can also search for courses and specific sections.

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Problem Background

Students face significant frustration with the manual, time-intensive preenrollment process (identifying what courses and sections to take each term). The university's online platform lacks essential features which could hasten the process, and the simplicity of some of these results in a negative perception of the university's administrative functions. Surveys and course evaluations consistently indicate student dissatisfaction, highlighting a critical need for more efficient scheduling tools. This issue is frustrating enough that each of the last six editions of the Introduction to Software Engineering course has featured at least one project proposal aimed at improving this process, underscoring the persistent demand for a solution.

We store every term's course data in Cloud Firestore with the model below:



To source our course data, we created scrapers in Python for the online sources of course data provided by the university.



Generated Schedules page shows all the possible schedules for their desired courses, ranked by their preferences

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Saved Schedules page shows schedules stored on the user's device and allows for exporting to other mediums



Conclusion

Objectives

•Establish a reliable data source for UPRM courses that matches the information available through official university platforms with the data between the two differing for at most 24 hours under normal operating conditions.

•Achieve a round trip time of under 1 second from when a user inputs the courses they wish to take until they can view a tuition schedule assuming we are able to generate a non-conflicting schedule based on their courses.

•Reduce the average time to do enrollmentS when you are aware of what courses you would like to take to under 10 minutes given that there exists a possible tuition schedule given your desired courses.

iOS

Because there could be thousands of possible schedules, we defer the computation of these to our users' devices, with our backend only serving the course data. Once users have their courses, we generate schedules utilizing Depth First Search with Backtracking, with sections being ordered according to student preferences to maximize the chance of generating a satisfactory schedule. Once schedules have been generated, a ranking system grades each schedule based on a separate set of student preferences (how many courses have the preferred modality, how many days have lectures, how tightly packed the lecture times are, etc.) and orders them accordingly. Schedules can then be saved to the user's device and shared through text codes.

The project successfully created a freely available, all-in-one solution for pre-enrollment of courses with an intuitive user interface. The solution met all the objectives, with students now having a better alternative than the university platform for preenrollment.

References

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