

Creation and Implementation of an Interactive App for Student Orientation in an University

Mihai Sorin Udrescu, Alin Florin Vartan, Madalina Carbureanu

Petrol-Gaze University
Ploiești, Romania

mihaisorinu@yahoo.com
vartan.alin@yahoo.com
mcarbureanu@upg-ploiesti.ro

Abstract - The application developed in C# is designed to help year one students from the Petroleum Gas University from Ploiesti with their orientation in the university labs and classrooms. In order to find their desired labs or classrooms, the developed application offers to the students an interactive map depicting the campus. Also the application offers the possibility of accessing the first year students timetable for any specific department, such as Automation, Computers and Electronics. The developed interactive app may be expanded with numerous other features, for example: the possibility of creating a path based on the students' timetable and the facility of sending an e-mail to the user.

Key-words - interactive map, student orientation, timetable, Excel, C#, database

I INTRODUCTION

The specified target of the C# application is the first year student from the Petroleum-Gas University from Ploiesti, because it helps in the students' orientation process in the university labs and classrooms. In literature [1], [2] it is emphasized the need of such an application in the educational institutions in order to facilitate the integration and orientation processes of the first year students by offering them faster and reliable access to the university's labs and classrooms.

II APPLICATION FUNCTIONS

The application was initially designed in the C# programming language, while the database presents elements commonly associated with the SQL programming language found in advanced database generation apps like Oracle.

The purpose of this app is based on pinpointing the exact location of a courseroom and to display the university structure, floor and the room number as specified by the user. Another function of the program is that of facilitating the transition process of a student from one

course room to another (the destination is specified by the user). The algorithm is based on if clauses: it verifies if the university bodies are different, if they are a preset trajectory is displayed, if they are identical, the algorithm verifies if the two course rooms are on different floors or not. On screen a message is displayed which transmits information about the destination to the user.

The secondary objective of the app is that of displaying the specific timetable of a student group, department, facility created using the auxiliary program Excel. Excel is considered an auxiliary program because its purpose is that of displaying the timetable of another student group. Excel is a program dedicated to database creation and in essence the student timetable is a database.

The application features are:

1. A database that presents a Login-Register mechanism;
2. Specification of the university body, floor and courseroom number by the student;
3. Creation of a possible road that may be used by the user;
4. Timetable display;
5. Possibility of sending an e-mail to the user;

1. The database found in Form 3 and 4 (Figures 1 & 2) present a local database, a table that has the "Username" column as it's primary key beside the "Password" field. Within Form 3, a connection is created to the SQL server (SQLConnection con) and the table is populated with results due to a command (SQLCommand cmd) which verifies if the username and password coincide. This is the application's Login mechanism.

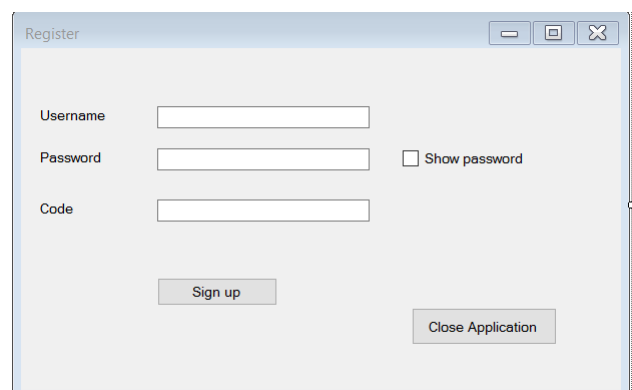


Figure 1 Form 4 The Register Mechanism

Figure 2 The Login Mechanism (Form 3) [8]

2. The function located in Form 1 (Figure 3) decrypts the characters written by the user which characterize the Petroleum-Gas University, and then displays on the University's map located in Form 1, the rooms location, the University body, floor and room number(if specified) in which the student is present or actively searching for.

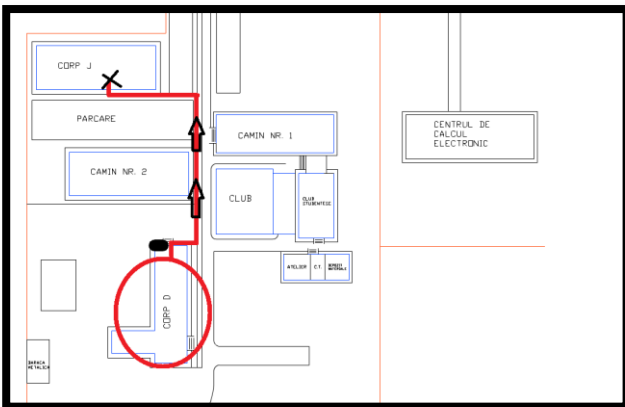


Figure 3 Example of an arbitrarily chosen road (Form 1)

3. The road creation (Figure 3) is generated only when the rooms are different. If the University rooms coincide, a message is displayed which sends the user a set of instructions. If the two rooms are different, the program displays the road between the two points (the initial location and the searched lab or classroom -the destination point).

4. The timetable observation (Figure 4) is done by: specifying the path of an Excel document located in the user's computer, selecting the path of the Excel document and typing the sheet number. The possibility of sending an e-mail which contains a code is presented in Form 4 [3][6][7].

Figure 4 Form 2 The students' timetable will be displayed on screen after the Excel document path is chosen and the group number is typed in by the user

5. Within Form 4 (Figure 5), it is created a new connection to the SQL server (SQLConnection con) and a new command (SQLCommand com) which populates the aforementioned table with the username and password only if the randomly generated control code was successfully introduced. The randomly generated code is sent to the e-mail of the person that holds the administrator rights.

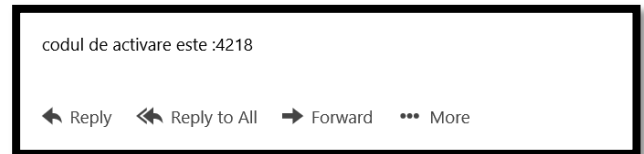


Figure 5 Exemple containing the randomized code for the student's login process

III APPLICATION GUIDE

This section will explain the thinking process behind the interactive application.

In Form 4 (Figure 1), the student may create a custom username and password. Once the name and password are selected the student will receive an e-mail containing the randomly generated verification code.

In Form 1 (Figure 6) the student may specify a desired starting position (the university structure, floor and room number in which he resides – the starting point and destination point). The student receives a message which confirms his position, as well as the destination point (body, floor and room number, all seen in a message). After the data was introduced the app generates a possible trajectory that may be followed by the student in order to reach the desired courseroom (Figure 7).

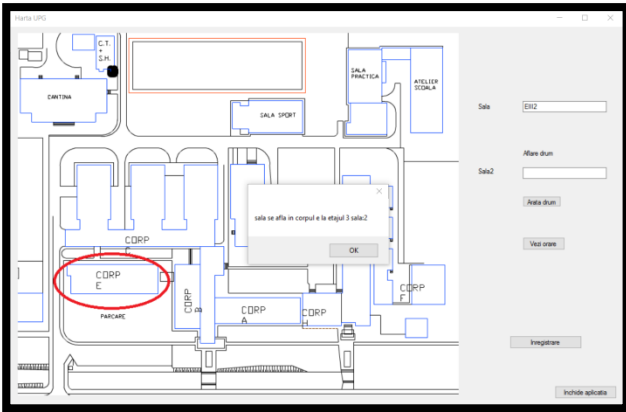


Figure 6 Form 1 Starting location example

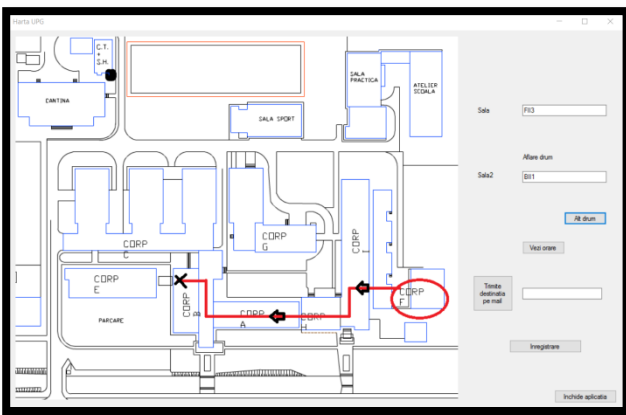


Figure 7 Form 1 Road example

In Form 2 (Figure 8), the student may view his timetable by specifying a path for the Excel document which it contains his timetable and by typing in his group number [4].

The code locates the path of the Excel document in the PC. The user will introduce the sheet number attributed to his group's timetable. The result will be displayed as a table similar to Tables 1 and 2 presented below.

Table 1 displays the timetable of the Computers department group 10206 as requested by the user in Form 2. In similar fashion as Table 1, Table 2 displays the timetable for the Computers department group 10205B [5].

Figure 8 Form 2 Timetable view[7]

Table 1 The timetable of the Computers department group 10206

Computers year 1 group 10206			
Day	Intervals	Frequency	Room
monday	9.50-11.30		A d 3
monday	11.40-13.20		FA 1
monday	15.20-17.00		I p 1
monday	17.10-18.50		I p 1
tuesday	9.50-11.30		E V 12
tuesday	11.40-13.20		B d 1
tuesday	13.30-15.10	week 2	B IV
tuesday	17.10-18.50		
wednesday	9.50-11.30	week 2	FA 3
wednesday	11.40-13.20		B II 4
wednesday	13.30-15.10	week 1	I II 2
wednesday	13.30-15.10	week 2	
wednesday	15.20-17.00		
thursday	9.50-11.30		I p 4
thursday	13.30-15.10		I III 1
friday	9.50-11.30		I p 3
friday	11.40-13.20		I IV 2

Table 2 The timetable of the Computers department group 10205 B

Type	Discipline	Teacher	Optional
C	Psychology	Herseni	yes
C	Philosophy	Prof G. Vasilescu	
C	Chemistry	Sef lucr. Dr. ing. I. Camenita	
C	Physics	Lect. Dr. fiz. Z. Borsos	
L	Physics	Z.Borsos	
L	Electrical Engineering	L.Georgescu	
L	Chemistry	I.Camenita	
S	Psychology	Herseni	yes

C	Electrical Engineering	Al.Savulescu	
L	Algorithm Design	M.Carbureanu	
S	Philosophy	I.Dumitrescu	
	Physical Education	V.Oprea	
S	English	A.Balu	
C	Calculus	Lect. Dr. A.Iosif	
C	Algorithm Design	Seflucr. Dr. mat. M.Carbureanu	
C	Electrical Engineering	Sef lucr. Dr. ing. Al. Savulescu	
S	Calculus	M.Nicolae	

IV ANDROID APP

In order to help the first year students, find their bearings in the University, even more, a mobile app was created in order to facilitate access to a University general map. In addition to the map, the app retains the C# app's function of generating a trajectory that may be followed by the user in similar fashion as the starting location – destination point mechanism found in the computer app (the user can choose between a few select starting points such as the bus stop, the student dorms, university bodies etc. and destination points such as the sports field and different university bodies).

The application was developed in MIT App Inventor, an open platform for independent mobile app creation[9].

The following image depicts the main interface of the mobile app. Two distinct choices can be made by the user: the creation of a trajectory between two locations in the university or the consultation of the campus map.



Figure 9 Starting interface on the mobile app

The next image depicts the window that appears after the user selected the option to create a road between two points in the university.

As a user you may choose between:

- Student dorms (student dorm number)
- University bodies (as well as the floor and courseroom number)
- Locations of interest



Figure 10 Introduction of starting and destination points on the mobile app

The following image shows an example of a custom path between two university bodies.

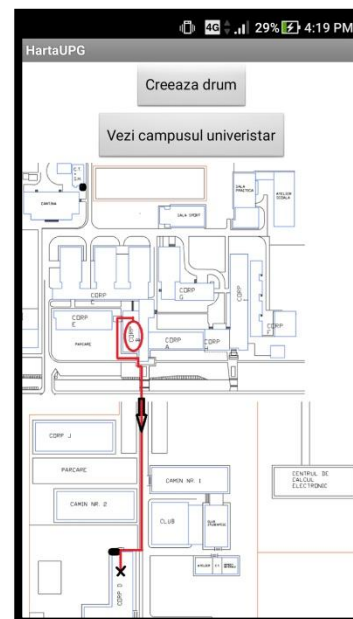


Figure 11 Example of trajectory creation on the mobile app

The app provides the student with the campus map for consultation. The user may wish to discover where high-interest locations are located on the campus map, besides the map localization of the desired key-location, the user receives a paragraph of information about the specific spot.

In addition to the features presented above, the user may consult the general secretariat timetable which shows the work-hours.

It should be noted that the Android app does not make use of the Excel file present in the C# app and does not use a DB connection.



Figure 12 Campus map and the secretariat timetable on the mobile app



Figure 13 Example of a key-location as specified by the user on the mobile app

V CONTRIBUTIONS

The authors' contributions are: the creation of the trajectory and the user's location in the university (initial and final location) and the creation of the mobile app.

Adaptations: database, Login-Register mechanism and the Excel timetable.

The app may have as a future characteristic the generation of a randomly created timetable which can have specific conditions (teachers' preferences).

Future work:

1. Implementing the application at university level.
2. Automatic timetable generation based on the teachers' preferences.
3. Creation of a dedicated learning platform for the students.

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