RFID system for borrowing keys from reception

Countries:	Hungary	Slovakia
Suitable for grade:		3 – 4
Specialization:		Technical lyceum
Responsible teacher:		Michal Copko

Project description:
Goal is to create system based on microcontroller and web interface for borrowing keys of classrooms by teachers from school reception. System should have client station, which is microcontroller based circuit with reader of 125kHz RFID tags and Ethernet and/or WiFi module. Server part will be based on web technologies so it will be platform independent and it's role is to collect tag ID of borrowed key and save the name of teacher/employee, who has the borrowed key.
Optional feature: If time schedule is imported to server, it should suggest the name of borrowing person.

Project tasks:
Student #1 (HU):
- Suggest the process of borrowing keys with RFID system to have as little impact on current borrowing process as possible
- Design circuit for client part of borrowing system
- Design PCB for microcontroller with RFID reader and Ethernet/WiFi module
- Prepare microcontroller program for reading RFID and sending tag ID to server
- Test the functionality of system

Student #2 (SK):
- Suggest the process of borrowing keys with RFID system to have as little impact on current borrowing process as possible
- Prepare database for storing data of borrowed keys
- Prepare script for receiving tag ID of borrowed key and let the receptionist add name of borrowing person
- Prepare report of currently borrowed keys and historical reports based on chosen day
- Optional: Prepare script for importing current schedule (timetable) and suggest name of person borrowing key based on current time and day of week

Success criteria:
Project will be successful after construction of working system for borrowing keys that has attached RFID tags to them and prepare report of borrowing with current and recent borrowed keys. All project parts should be cost efficient and software code should be well designed (time and memory efficient, without bugs). Project documentation has to be prepared based on given template in the range of 15-25 in English and native language.

Developed hard skills:
Programming, debugging, working with RFID technology, electronic measurement, working with datasheets, programming, computer networks and network protocols, working with microcontrollers, CAD systems, design of PCB, soldering

Developed soft skills:
Cooperation, working with computer, planning, teamwork, tracking progress, communication in foreign language, responsibility, compliance with agreements, respect deadlines, problem solving, finding and processing information, design thinking, following safety and ergonomic rules