

IN1020 Mandatory exercise 1: Applied security

Deadline for delivery: October 1st 2019 at 23:59

Introduction

Based on a given problem, you will be asked to answer eight tasks.

Requirements

- The delivery should be in one file, clearly marked with name and username. The answers should span maximum two pages (about 1000 words).
- The delivered file must be of the file format pdf. Most text processing tools allow you to save a document as pdf, whether you are using your own computer or a computer in one of Ifi's computer labs. Some of the tools available at UiO:
 - [LaTeX](#)
 - [Office 365](#)
 - [G Suite](#)
- The assignment shall be delivered in [Devilry](https://devilry.ifi.uio.no) (<https://devilry.ifi.uio.no>).

Background

A high school are going to start using a new digital platform for learning (LMS, Learning management system). The learning platform will run on servers stored in a serverroom in the school, where all the data in the system also are being stored. The computer system will be available through the internet as both a web application (web page) and a mobile application. Data (information) which are being stored and processed in the system includes:

- Information about the pupils: Full name, class, name of parents, adress, cell phone numer, date of birth.
- Information about the teachers: Full name, classes, aadress, cell phone number.
- Digital assignments from the pupils: The pupils submit digital school work (e.g. documents, recordings of audio or video) in this system.
- Teacher feedback on the submissions, including grades.
- Interim evaluation and overall achievement grades.

Oppgave

Your task is to make an overall evaluation of various information security issues, which the school management must then consider and possibly deal with before the computer system can be used. All tasks should be solved based on the scenario given above.

Task 1 Identify a couple of *values* in this scenario. Can you imagine values that are more important to a student than a teacher, and vice versa? Explain briefly, with examples. Also, name a couple of likely threat actors.

Task 2 CIT-services (confidentiality, integrity and accessibility) are essential features of information security. For each of them, consider the importance as well as things that may go wrong. That is, what may represent a *threat* or danger to each security objective.

Task 3 Give two general security controls that in this case can help to achieve a) Confidentiality b) Integrity

Task 4 Explain the role of accountability and authentication. Would you recommend prioritizing these security goals (security services/properties) in our case? Justify your answer.

Task 5 The school Skolen has an overall authorization policy which includes the following:

- Pupils shall have access to view/read personal information about themselves, and only themselves.
- Teachers shall have access to read/view personal information about all pupils they teach in at least one subject.
- Employees in the school administration shall have access to both view/read and change all personal information about both teachers and pupils.

This policy applies regardless of how the information is requested, e.g. orally to the administration at the school, or directly in one of the computer systems the school uses to store and process this type of personal information. This means that the new digital learning environment must also *enforce* these policies. Briefly explain the overall mechanisms/functions that must be in place in the computer system for this to be implemented.

Task 6 The school management also consider using a module in the system where pupils or their parents can report absence and the reason for absence, and where teachers can register a pupil's absence. Does the school have to pay special attention before they can use this modul? Justify your answer.

Task 7 Student Network: The school's wireless network (WiFi) har been set up without a "password" for encryption. Why is this a bad idea? Does turning on "encryption" in the wireless network affect whether it is safe to allow students and teachers to share a wireless network? Explain briefly.

Task 8 Think like a «hacker»: As a student, you will try to change a grade in the system. Give an example of how you would do this! (PS. No exact answer :-)