Høyskolen Kristiania

**Course code:** TDS200
**Subject name:** Kryssplattform
**Exam format:** Written home exam individually or in group up to 3 members
**Delivery/submission date:** 15.12.2023
**File format:** .zip

Remember to state your candidate number on your delivery folder.

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# EXAM
# TDS200 Kryssplattform
## Autumn 2023

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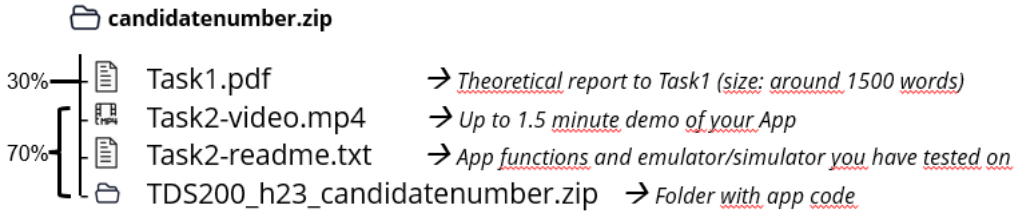
You are required to complete two tasks, and your performance will be evaluated based on both technical and theoretical competence. The following pages contain the details of the two tasks. Your submission should follow the below structure:




## Important Information

- This home exam can be solved and delivered individually or in group up to 3 members. It is expected that a group submission shall accomplish more, i.e., in terms of code volume and complexity etc than individual submission.
- Assessment guide for internal and external assessors, also as a reference for students, can be found at the end of this exam text.
- Read through the entire exam text before starting.
- Always follow good referencing practice. When using quotes, code snippets, statistics, images, figures, or similar elements that you have not created yourself, it is essential to provide proper citations. Follow the referencing guidelines established by Høyskolen Kristiania.
- Plagiarism must not occur. It is not allowed to copy code without providing a proper reference. Using TDS200 course lecture code is not regarded as plagiarism.
- Using component library and npm modules is not considered plagiarism, and it is encouraged to demonstrate your competence utilizing npm/third-party libraries. Remember to provide appropriate references too.

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# Task 1 – Theoretical competence (weighting: ~30%)

This report consists approximately 1,500 words, excluding the reference list.

In this task, you will take the role of "Tech Lead" within a small company developing an application called "TravelSnap" (think about Instagram, Flickr, etc). TravelSnap is designed to simplify travellers' experiences by focusing on three core functions: taking photos, sharing geolocations, and connecting with others for tips and recommendations. Your team comprises three full-stack developers with expertise in JavaScript/TypeScript. All have experience in building web solutions and backend. Each team member also has some knowledge of mobile development and has worked on various hobby projects using different technologies.

The company's primary objective is to create a user-friendly mobile application that enhances the travel experiences and encourages travellers to document and share their adventures. The company seeks for market statistics on the distribution of Android and iOS users in Norway. Part of your task will be to collect such statistics as a basis for which platform possibly must be prioritized. Additionally, given the rising interest in travel blogs, time to the market is an important factor in the development of the new app.

Given the information above and the requirement specification below, your assignment will be to formulate and present your idea as the "Tech Lead" regarding the most suitable approach for the development of TravelSnap app.

**Requirement specification of TravelSnap (no priority order by numbering)**

| # | Function |
|---|---|
| 1 | The app must communicate with a backend service, e.g., Firebase |
| 2 | Users should be able to view traveller photos in a gallery format |
| 3 | Users should be able to access the photo details by clicking it |
| 4 | Users should have the opportunity to upload their own travel photos in a secure and intuitive way |
| 5 | New photo uploads may include images, descriptions, hash tags, locations, and date information |
| 6 | Users can leave comments and share experiences on the photo detail page |
| 7 | Navigation between pages is expected. |
| 8 | It is desirable to incorporate a map view within the app that displays the geographical locations where the photos are taken. |
| 9 | The app should showcase its own visual design inspired by travel and exploration |
| 10 | The app should be accessible on both Android and iOS platforms to cover the entire mobile market |

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# Task 2 – Technical competence (weighting: ~70%)

For this task, you are going to create an application called TravelSnap. You may choose either **Ionic + Vue** or **React Native** for frontend development (in alignment with the technologies covered in the course), and **Firebase** as Backend as a Service.

**Key evaluation criteria for the exam**:

- The solution functions properly (builds and runs without errors) and can be run with Web browsers, as well as Android emulator and/or iOS simulator.
- Comment the code to illustrate your understanding of code and clarify complex logic. (Note that not all code requires commentary. The comments should show exam sensor your comprehension of the code you have provided)
- The code should adhere to best practices to enhance code quality, including proper naming conventions, code structures and code reusability, among other things.
- The app should be user-friendly, and functionalities should work as expected.
- Any external libraries, modules, or packages used in the project should be integrated appropriately.

**Creation and delivery of exam project:**

- Create your own Firebase and there must be some data available at Firebase so that the exam sensor can see that the solution works.
- Make a short video (screen recording without sound) of the app showing the functions you have implemented. Limit the video to no more than 1.5 minutes and ensure it highlights any advanced features that may affect the grade.
- Please also attach a file called Task2-readme.txt to describe what functionality you have implemented in the app and whether you have run it on Android emulator, iOS simulator or both.
- Remove the node_modules folder before uploading to WISEFLOW!
- Make sure the package.json file contains all npm dependencies, expecting the exam sensor to install npm packages with the command “npm install”
- The project folder you delivered shall be named as “TDS200_h23_your candidate number.zip”

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# Case: TravelSnap App

This technical task is built on top of the theoretical analysis from Task 1. Regardless of your conclusion made for Task 1 about the suggested development approach, you should develop the TravelSnap application using either **Ionic + Vue** or **React Native** for frontend, and Firebase as backend as a service.

### Four primary requirements for implementation (no priority order by numbering):

- Present an overview of all traveller photos that are retrieved from Firebase. This can, for example, to be in a list or grid format.
- Ensure that each travel photo is clickable to access a detailed view or information.
- Develop a secure and intuitive interface where users can upload new traveller photos directly from camera or select from existing gallery. Along with the photo, users shall be able to add captions and additional information before storing in Firebase.
- Allow users to navigate seamlessly between different pages, i.e., the photo overview, detailed view, and upload images.

The four points mentioned above present the minimum requirement for the assignment. For those aiming for a higher grade, more functionalities and complexity in the implementation is expected. Please check below list to see examples of functionalities that can contribute to a higher grade. Note that the app should be designed for the sensor to easily test with minimal manual configuration.

### Examples of extended functionalities that can achieve a higher grade:

- The app provides authentication opportunity for users to register, log in and log out.
- Only logged in users should be able to access photo details and upload new traveller photo, etc.
- Give the user the opportunity to search and/or filter travel photos based on keywords.
- Users can leave comments or share feedback such as like/dislike on individual detail photo page.
- Users can delete their own comments.
- Provide GPS (Geolocation) information to allocate where the photo is taken.
- Incorporate a map view, i.e., Google Maps in the app.
- Feedback during user interaction (error messages, loading spinners, etc.).
- Implementation of accessibility principles such as router guards.
- A separate profile page for logged in users.

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**Assessment Guide**
**TDS200 Kryssplattform**
**Autumn 2023**

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# Task 1 – Theoretical competence

In Task 1, the candidate must assume the role of “Tech Lead” in a fictitious company that develops a travel photo sharing application called “TravelSnap”. In around 1500 words, the candidate(s) is required to discuss and debate the most appropriate app development approach for this project, considering the provided requirement specification.

**Expectations for the content and level of answer**:

- The candidate(s) is expected to use combination of own experiences and external sources including online materials, research articles, blog posts, video content etc., to support the conclusion.
- The candidate(s) is expected to demonstrate a solid understanding of different app development approaches, highlighting their advantages and limitations.
- The candidate(s) is expected to incorporate relevant data and statistics for Android and iOS usage in Norway, as well as the adoption rate of cross-platform technologies., into the analysis.

**Relevant working material may include (Posted on canvas page):**

- Analyzing User Experience in Mobile Web, Native and Progressive Web Applications - A User and HCI Specialist Perspectives
- BridgeTaint: A Bi-Directional Dynamic Taint Tracking Method for JavaScript Bridges in Android Hybrid Applications
- End Users' Perception of Hybrid Mobile Apps in the Google Play Store
- A Survey and Taxonomy of Core Concepts and Research Challenges in Cross-Platform Mobile Development
- The Impact of Cross-Platform Development Approaches for Mobile Applications from the User's Perspective
- "React Native at Airbnb" by Gabriel Peal (2018) - https://medium.com/airbnb-engineering/react-native-at-airbnb-f95aa460be1c
- “Architecting Mobile Web Apps" by Michael Bleigh (Google I/O'19) - https://www.youtube.com/watch?v=NwY6jkohseg

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# Task 2 – Technical competence

For Task 2, the candidate(s) must implement an application called TravelSnap using either Ionic + Vue or React Native for frontend development (in alignment with the technologies covered in the course), and Firebase as Backend as a Service. The candidate must also deliver a maximum 1.5-minute screen recording without sound showing the functions the candidate(s) has implemented.

**Expectations for the content and level of answer**:

- Four primary requirements for the implementation must be presented. These constitute the minimum requirement for the task. If only these four primary requirements are met, the candidate(s) can expect a maximum grade of C, given that delivered code fulfilled a very high standard. To achieve a higher grade above C, the student must demonstrate skills and knowledge beyond these four primary points.
- A list of examples for extended functionalities is attached to the assignment. An extremely good solution will include most of these advanced features, and/or functionalities of similar complexity and nature.
- Code snippets taken from external sources will not directly contribute to the grade. However, below two will contribute to the grade:
  - if the candidate(s) has made major changes to the code snippet and has adequately documented this comprehension.
  - The code originates from component libraries and is used as intended in the documentation.

# Appendix: Grading scale

In the exam text, the approximate maximum score per task is shown as below:

| Symbol | Fra eksamensavdelingen |
|---|---|
| A | 90-100 poeng |
| B | 80 – 89 poeng |
| C | 60 - 79 poeng |
| D | 50 - 59 poeng |
| E | 40 - 49 poeng |
| F | 0 - 39 poeng |

- Task 1 = ~30 points
- Task 2 = ~70 points
- Total = 100 points

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