Università della Svizzera italiana

Faculty of Informatics

## Lecture Mobile Computing, fall term 2020
## Android Programming Project (APP) – Project description

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| Group name: | Pandemonium |
| Group members: | Simone Eandi, Guido Ferretti, Alessandro Trombini |

**Instructions**

- Please answer the questions reported in the following two pages using the foreseen text boxes.
- Do not change the format, font size or any other elements of this template.
- Be concise and precise.
- Do not exceed the given limit of maximal number of characters. The given limits are intended including white spaces (e.g., the sentence "*This is a nice sentence*" contains 23 characters).
- "The app" mentioned in the questions refers to the Android-based application that you develop in the context of the Mobile Computing class.
- Once compiled, please upload the document on iCorsi.
- The deadline for sending the document is Thursday, November 5, 2020, 19:00 CEST
- If you have questions: post your question(s) in the iCorsi forum or e-mail elena.dilascio@usi.ch and shkurta.gashi@usi.ch.

1. **What is the name of your app?**

Soul Compass

2. **Which problem does the app solve?** (Max. 200 characters)

Monitoring stress levels and suggesting relaxing activities to relieve stress

3. **How does your app solve this problem?** (Max. 650 characters)

The app relies on the measurement of the heartbeat rate in order to detect the stress level of the user: when he performs a measurement, if the app detects that he is too stressed, it will suggest him an activity to calm down, such as listening to relaxing music or have a walk. The app records every measurement so that it can show how the stress level changes over time to allow the user to better understand which are the causes of stress. Finally, the app helps the user to make it a habit do do relaxing activities everyday in order to prevent stress.

4. **Why is this problem relevant?** (Max. 300 characters)

Stress is a reaction of our body to a challenge/demand perceived as excessive. In our frenetic modern society too many people are overwhelmed with activities that must be taken care of on a regular basis, experiencing more stress than they should.

5. **Do other apps exist to solve this (or a very similar) problem?**

Yes [ ] No [ ]

6. **If you answered *yes* to question 5, list the existing apps that are most related to yours and explain how these solutions differ from your own. If you answered *no* to question 5, explain why do you think nobody else has solved this problem before.** (Max. 650 characters)

(YES) Simple Habit provide to the user brief meditation every day to reduce stress, differently from our app, it does not monitor the stress level of the user and requires to create an account.Stress Check uses the camera and flash to measure the heart rate and infer the stress level of the user, however, it is simply a stress monitor and does not help the user to relieve stress. Pacifica (now Sanvello) is another app that monitor your mood and helps the user to take care of his mental health, however, the mood tracker is based only on feedbacks given by

7. **Which of the built-in sensors of your phone does the app make use of?** (Max. 200 char.)

Accelerometer, step counter, heart beat rate sensor (possibly the camera in its absence).

8. **Which of the built-in actuators of your phone does the app make use of?** (Max. 200 char.)

Display, speaker (possibly the flash).

9. **Does your app store sensor data locally, remotely, or in both ways?**

Locally [ ] Remotely [ ] Both [ ]

10. **Motivate your answer to question 9 (i.e., explain why your app stores data and why it does so only locally/remotely or in both ways).** (Max. 650 characters)

(LOCALLY) The app needs to keep a record of the user heart beat rate measurements and steps done, since this information concerns only the user that recorded it, the data can be stored only locally.

11. **Which type of data visualization your app offers and why. If you answered *no* to question 11, explain why data visualization is not necessary for your app.** (Max. 650 characters)

The app shows to the users how his stress level changes across some period of time, to give him better insight on the triggering factors, which can be done using a line chart or column chart. The app also shows a record of the activities that the user did, such as the number of steps, through a column chart.

12. **Does your app perform any type of data processing on the collected sensor data?**

Yes [ ] No [ ]

13. **If you answered *yes* to question 13 explain which type of data processing your app performs on the collected data and why. If you answered *no* to question 13 explain why data processing is not necessary for your app.** (Max. 650 characters)

(YES) The app maps the heart beat rate measurement to the corresponding stress level for the user. Processing pipelines may also be used for counting the number of steps depending on the type of sensor used.

14. **How do you evaluate whether your app performs correctly and achieves its goal (i.e., solves the problem described in question 2)?** (Max. 650 characters)

The app sometimes asks to the user to provide a feedback on his currently perceived level of stress after a measurement of the heart beat rate is done, this is used to check that the stress level estimation made by the app is relatively close to what the user perceives. When the user engages in one of the activity suggested by the app after detecting a high level of stress, the app asks him after a short while to take a new measurement of his stress levels to check the effect of the proposed activity.

15. **Which permissions does your app require to be granted by the user?** (Max. 200 characters)

Various permissions to access the sensors.

16. **Does the app raise any ethical issues?**

Yes [ ] No [ ]

17. **Motivate your answer to question 16** (Max. 300 char.)

(NO) The app simply provides an estimate to the user of its stress levels and suggests relaxing activities to help calm him down using a best effort approach, it does not try in any way to replace a medical diagnosis and/or treatment.

18. **Which are the main challenges that you expect to encounter in order to build your app?** (Max. 300 characters)

A crucial challenge of the app is being able to provide a relatively good measurement of the heart rate. Not many smartphones have a heartbeat sensor, so we may need to get the measurement from a wearable device or directly measure it using the camera and flash if we want to extend the user-base.