Human-Computer Interaction Group

Leibniz Universität Hannover

Mobile Interaction
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Assignment 2

All exercises that are not explicitly declared as group tasks must be done individually and handed in individually. Identical submissions are treated as plagiarism. Plagiarism may lead to loss of exam bonus points.

You can submit the solution to this task in English or German until Wednesday, April 17, at 23:59 via https://assignments.hci.uni-hannover.de. Create a pdf file that contains the text and images of your solution, name it "Assignment-02-<Firstname>-<Lastname>.pdf", and save it together with the exported project (Android Studio: File → Export → Export to Zip File) in a single zip file. Your submission must consist of a single zip file containing all necessary files. The name of the .zip file, as well as the names of the contained files, **must not contain any umlauts**. Therefore, please resolve umlauts in file names.

Exercise 1: Smartwatch Application (11 points)

In the lecture different portable devices were presented. Find out what technical possibilities smartwatches offer. Think about an application for which a smartwatch offers advantages over a mobile phone. This application should not be too trivial. The application may either be already existing or a concept designed by you.

a) Give a brief overview the application's purpose and its usage context. Moreover, sketch the application with a simple storyboard with about 3 images (showing screens and/or context). Provide each image with a short description (under each image). **(9 points)**

b) Describe the advantages over an equivalent smartphone application. The advantages may, for example, be due to a specific usage context or user group. **(2 points)**

Exercise 2: Tactile Feedback (12 points)

Write an application that plays three different vibration patterns. The interface should consist of multiple buttons for the different vibration patterns and a stop button. The following patterns shall be played repeatedly until stopped:

- Heart beat (strong impulse, pause, long impulse, pause)
- SOS (. . . - - - . . . ; 3x short, 3x long, 3x short)
- Waltz (3/4 time)

A vibration pattern can be coded like this (note the leading 0):

```
private val HEART = VibrationEffect.createWaveform(
    longArrayOf(
        // wait 0 ms, vibrate 65 ms, pause 297 ms, vibrate 44 ms, pause 552 ms
        0, 65, 297, 44, 552
    ), 1 // continuously repeat the pattern from index 1
)
```

a) Add two Text elements above the first button to output if the device has a vibrator and if the vibrator has amplitude control, respectively. **(2 points)**

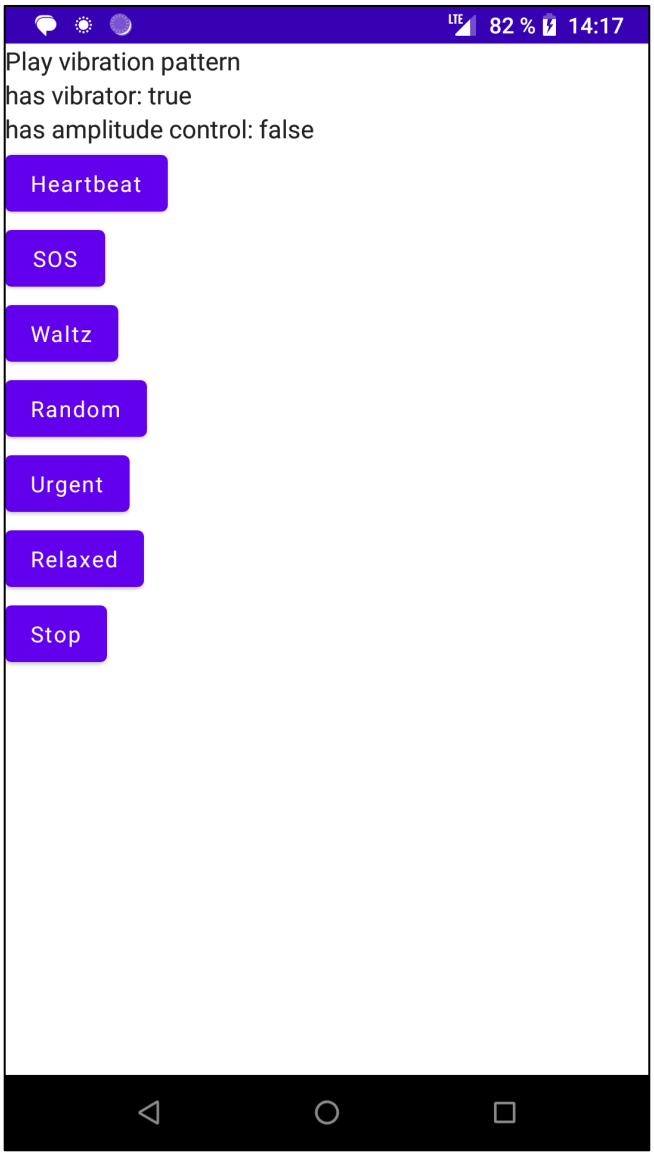
b) Add two Button elements below the first button to activate the SOS and WALTZ patterns, respectively. **(2 points)**

c) Add a "Random" button that randomly plays a pattern. Hint: There is a "random()" method for arrays. Is it possible for you to distinguish the three patterns? **(2 points)**

d) Design two patterns of your own. One pattern should convey a sense of high urgency. A second pattern should feel friendly and relaxing. If the pattern has a specific inspiration, describe it. Give a possible use case for each of your patterns. Implement the patterns and add buttons for them. If your phone has amplitude control, then you can use this feature. Otherwise just use timings. **(6 points)**

Hints:

1. Use the template available on Stud.IP: MI-assignment-02-VibrationPatternTemplate.zip
2. The Android emulator does not support vibration output. You need a mobile phone to experience the vibration output. If necessary, you may borrow an Android phone from us for the duration of the semester. In this case, please contact us.



Exercise 3: Material Design (4 points)

Research the Material Design Guidelines. At https://m3.material.io you will find the material design elements developed by Google with corresponding objectives and justifications.

a) Describe the purpose of material design. **(2 points)**

b) Describe the main principles and goals of the Material Design in your own words. **(2 points)**