Human-Computer Interaction Group

Leibniz Universität Hannover

Mobile Interaction
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Prof. Dr. Michael Rohs, Shashank Ahire, M.Sc.

Assignment 3

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 24, 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-03-<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: Material Design (9 points)

Have another look at the Material Design Guidelines. Please briefly answer the following questions.

a) What is a surface [1]? How are elevation and shadows [2] used? **(3 points)**
b) What are the two kinds of key colors and what is their purpose? What is a tonal palette? How are tones named? **(4 points)**
c) Why does each accent color role consist of four tones? **(2 points)**

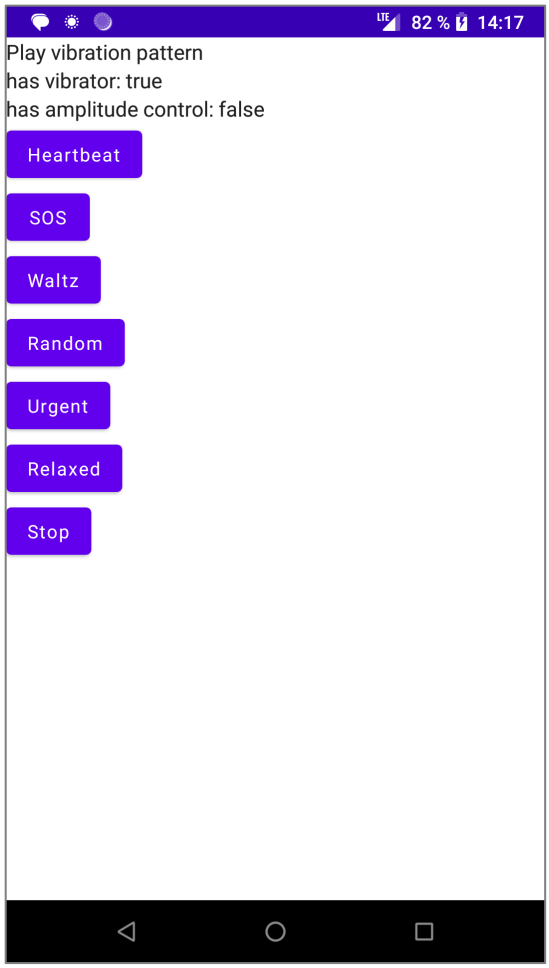
[1] Surfaces in Material 2: https://m2.material.io/design/environment/surfaces.html

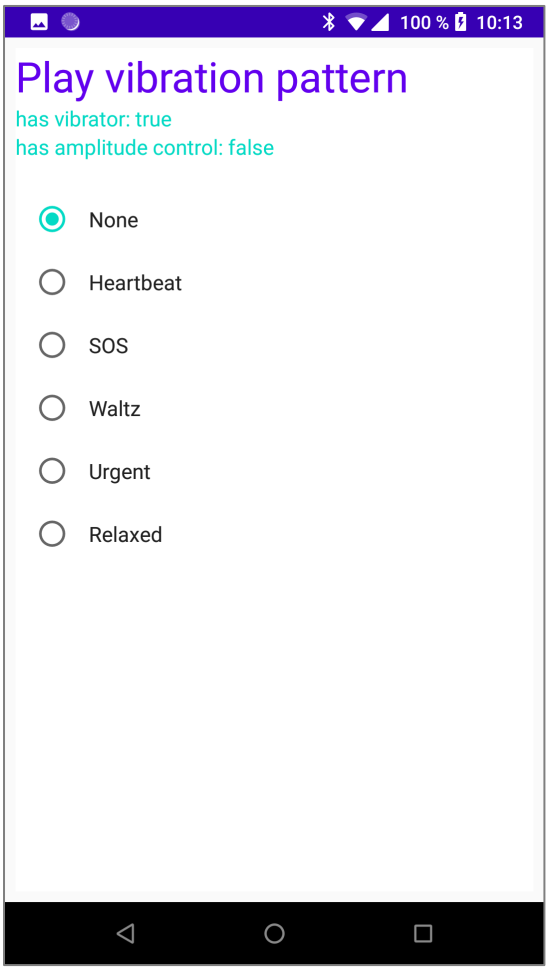
[2] Elevation in Material 3: https://m3.material.io/styles/elevation/overview

[3] Key Colors and Tones in Material 3: https://m3.material.io/styles/color/the-color-system/key-colors-tones

Exercise 2: Tactile Feedback App with Material Design (12 points)

a) Use Material Design and the Compose API to style your implementation of the tactile feedback app from the last assignment. If you have not done the last assignment, just create the graphical user interface in this assignment, without tactile feedback behavior. The app is supposed to get transformed from what is shown on the left to what is shown on the right. A detailed specification is given below. **(10 points)**





Here are the specifications for the new user interface:

- An 8.dp padding should be used for the outer surface.
- The title should be given in fontSize 32.sp and color MaterialTheme.colorScheme.primary.
- The second and third line should be shown with color MaterialTheme.colorScheme.secondary.
- There should be a spacer of 20.dp before the radio buttons: `Spacer(Modifier.height(20.dp))`
- The options should be specified in a set of radio buttons.
- Each option row should have
  - a height of 48.dp
  - a horizontal padding of 16.dp
  - a vertical alignment of Alignment.CenterVertically

To implement the radio buttons, use this template:

```
val radioOptions = listOf("None", "Heartbeat", "SOS", …)
val (selectedOption, onOptionSelected) = remember {
    mutableStateOf(radioOptions[0])
}
Column(Modifier.selectableGroup()) {
```

```
…
radioOptions.forEach { text ->
    Row(
        Modifier
            .fillMaxWidth()
             …
            .selectable(
                selected = (text == selectedOption),
                onClick = {
                    onOptionSelected(text)
                    when (text) {
                        "Heartbeat" -> vibrator.vibrate(HEART)
                        …
                        else -> vibrator.cancel()
                    }
                },
                role = Role.RadioButton
            )
    ) {
        RadioButton(
            selected = (text == selectedOption),
            onClick = null
        )
        Text(
            text = text,
            modifier = Modifier.padding(start = 16.dp),
        )
    }
}
}
```

b) In the above code snippet, each Row is made selectable via a Modifier. Comment out (or remove) the `selectable` modifier and instead, provide the onClick handler in the RadioButton (currently `onClick = null`). Explain how the interaction behavior of the interface has changed. **(2 points)**