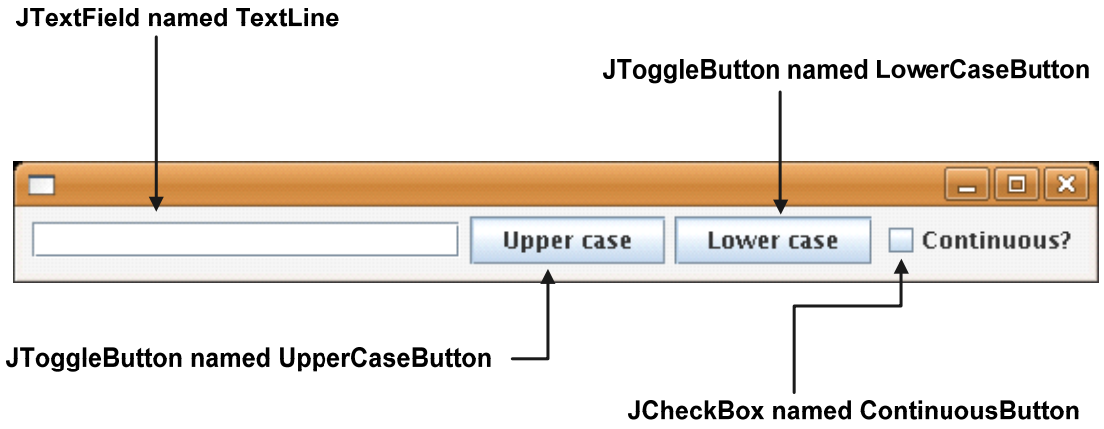
TDT4180 MMI - Exercise 1: Application class

The goal of this exercise is to learn how to make a Swing application (frame) and to react to button and text field events. See illustration of GUI below.



The application consists of an outer JFrame, an inner JPanel (subclass), one text field and three buttons. Two of the three buttons are toggle buttons in a group and the third button is a checkbox. The application supports text entry and changing the case of the text according to button presses and the button states.

Create a class named ButtonsNText that inherits from JPanel. Write a main method that creates a JFrame with a ButtonsNText instance as its content pane, so the ButtonsNText class can be used as an application (entry point) class.

The ButtonsNText panel must contain the following components:

- A JTextField named TextLine
- A JToggleButton named UpperCaseButton
- A JToggleButton named LowerCaseButton
- A JCheckBox named ContinuousButton

Note that the names are important for the JUnit test case to work, so make sure the component's setName method is called with the correct name after the component is created. These names will henceforth be used when referring to the components. The behavior of the ButtonsNText panel's components is as follows:

- TextLine must support entering a line of text.
- When UpperCaseButton is pressed, the text in TextLine must be replaced by the same text in upper case. E.g. if TextLine contains the text "tdt4100" it must contain the text "TDT4100" after this button is pressed.
- When LowerCaseButton is pressed, the text in TextLine must be replaced by the same text in lower case. E.g. if TextLine contains the text "TDT4100" it must contain the text "tdt4100" after this button is pressed.

- UpperCaseButton and LowerCaseButton must be in a button group, so only one is selected at any time.
- If the ENTER key is hit while TextLine has focus, the text must be replaced by the same text in the case corresponding to the currently selected toggle button (UpperCaseButton or LowerCaseButton).
- If the ContinuousButton is (already) selected and the user edits the text, i.e. types a key that changes the text, the text in TextLine must be replaced by the same text in the case corresponding to the currently selected toggle button (UpperCaseButton or LowerCaseButton). E.g. if TextLine contains the text "TD", UpperCaseButton and ContinuousButton are already selected and the user types the (lower case) letter 't', the text should be "TDT" afterwards.
- Whenever the text in TextLine is replaced, the caret position should remain unchanged.

Questions about the implementation:

- In GUI programming, we distinguish between lexical, syntactical and semantical events. What kind of mechanisms did you use to handle lexical and syntactical events in your implementation?
- What is the advantage of syntactical events compared to lexical events?
- Concerning the lexical events you answered for the first question above, could you have handled syntactical event instead of lexical events?