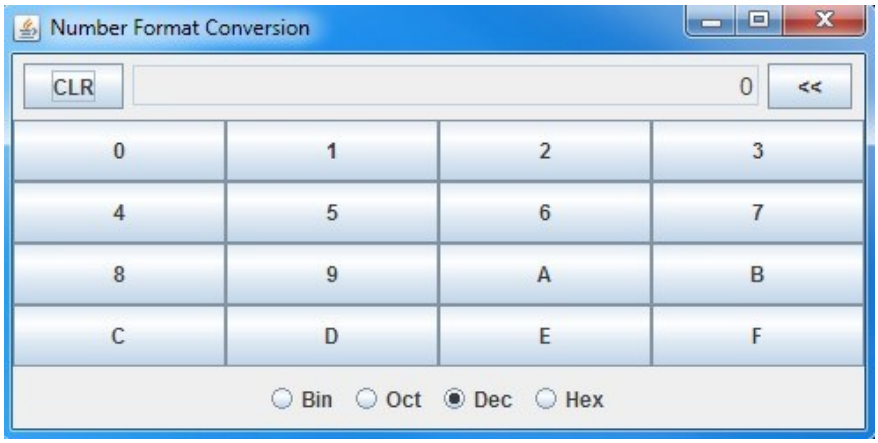
The layout of the frame window is done for you.



The JFrame contains the following components:

- a JTextField for displaying the number
- 18 JButton, '0' to '9', 'A' to 'F', 'CLR', and '<<'
- a group of 4 JRadioButton

You are asked to implement the followings:

1. Add suitable codes to complete the design of the constructor of the JFrame. One listener object is used to handle the action events of all buttons.
2. Implement the class **`ButtonListener`**. The operation of the buttons are defined below:
   - When the CLR (clear) button is pressed, the display is set to "0".
   - When the << (backspace) button is pressed, the last digit in the display is removed. If the display has only 1 digit/letter, it is changed to "0".
   - User can enter the number using the keys '0' to '9' and 'A' to 'F'.
     - Invalid input is ignored. For example, if the selected radix is decimal and the user presses on button 'A', the input is invalid.
   - A non-zero value does not have leading '0'.
     - For example, the value "0123" should be shown as "123".
   - The zero value is shown as a single digit '0'.
     - For example. "00" should be shown as "0".
   - The program is able to handle numbers with arbitrary length. You can represent the value of the number using **`BigInteger`**.
     - You can use the constructor `BigInteger(String val, int radix)`
     - To convert a `BigInteger` to `String`, use `toString(int radix)`
   - The radio buttons at the bottom are used to select the radix of the number. When a different radix is selected, the display is changed accordingly.
     - For example, if the display is "123" in decimal, it is changed to "7B" when the user selects 'Hex'.
     - Uppercase letters 'A' to 'F' are used in the display of hexadecimal number.