Exercise 8 (10 points) – can be done in pair or individually

- The first lines of all source files must be comments containing names & IDs of all members. Also create file readme.txt containing names & IDs of all members

- Put all files (source, input, readme.txt) in folder Ex8_xxx where xxx = ID of the group representative, i.e. your source files must be in package Ex8_xxx (assumedly in Maven's src/main/java). Input files must be read from this path

- The group representative zips Ex8_xxx & submits it to Google Classroom. The other members submit only readme.txt. Email submission is not accepted

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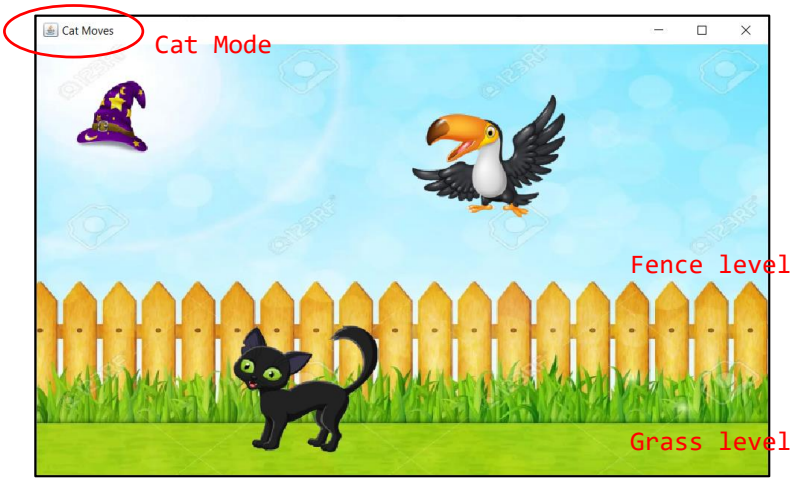
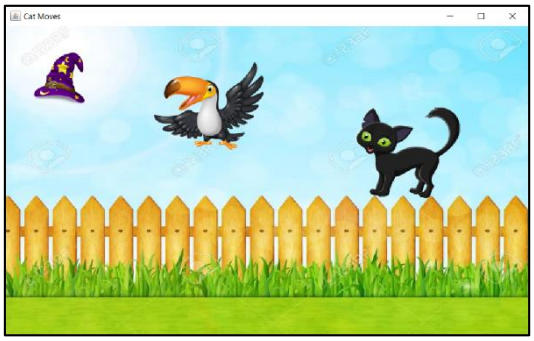
Use the given image files and source file (CatAndBirdFrame.java). Unzip resources.zip and put this folder in your project folder (Ex7_xxx)

Complete the source file to make the program work as follows:
There are 3 labels: catLabel, birdLabel, hatLabel

1. Either catLabel or birdLabel can be moved by arrow keys at a time

2. Use alphabet key C to switch to Cat mode, and B to switch to Bird mode. Cat or Bird mode is shown on title bar





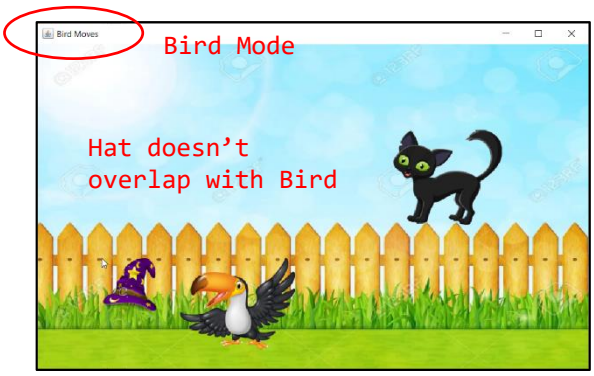
3. In Cat Mode, catLabel can do the following:
   3.1 The cat can move left/right by using arrow keys LEFT/RIGHT. When it reaches one side of the frame, it will appear on the opposite side

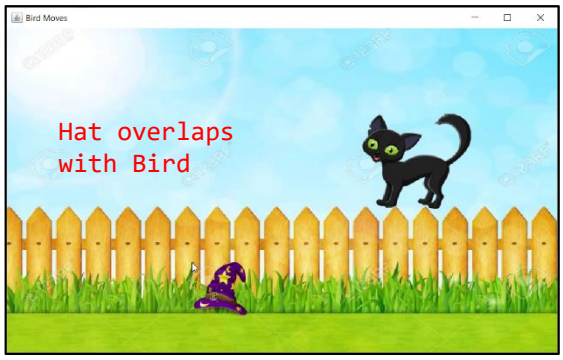
   3.2 The cat can only jump up (from grass to fence) or down (from fence to grass) by using arrow keys UP/DOWN.

4. In Bird Mode, birdLabel can do the following:
   4.1 The bird can also move left/right by using arrow keys LEFT/RIGHT. When it reaches one side of the frame, it will appear on the opposite side

   4.2 The bird can jump up (from grass to fence) or down (from fence to grass) by using arrow keys UP/DOWN

   4.3 Once it is on the fence, it can move further up by using arrow key UP. And when it is above the fence, it can move down to the fence by using arrow key DOWN





5. hatLabel can do the following:
   5.1 The hat can be dragged within the frame by using mouse
   5.2 If it is dragged on top of active label, i.e. catLabel in cat mode or birdLabel in bird mode, the active label will disappear. Once it is dragged out of the active label, the active label will reappear
   5.3 But if the activeLabel moves to overlap with the hat (i.e. the hat is not dragged), there will be no effect

6. Complete class CatAndBirdFrame extends JFrame implements KeyListener

   JLabel cannot hear KeyEvent. We have to make JFrame hear & handle KeyEvent on its behalf. And because JFrame can handle one JLabel at a time, we will make it handle activeLabel which can be either catLabel or birdLabel

   6.1 Add methods to set activeLabel to catLabel or birdLabel
   6.2 Add methods to make activeLabel move by calling its methods (e.g. moveUp, moveDown, moveLeft, moveRight)
   6.3 Add variables/methods or make further modifications as needed

7. Complete class MoveLabel extends JLabel. We will create catLabel and birdLabel from this class

   7.1 Add methods to update label position according to its move conditions (e.g. moveUp, moveDown, moveLeft, moveRight)
   7.2 Add variables/methods or make further modifications as needed

8. Complete class DragLabel extends MoveLabel implements MouseMotionListener. We will create hatLabel from this class

   8.1 Add methods to update label position according to its move conditions and check whether it overlaps with the active label or not

```
if ( label_1.getBounds().intersects(label_2.getBounds()) )
   System.out.println("label 1 overlaps with label 2");
```

   8.2 Add variables/methods or make further modifications as needed