

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 (PoppinsFrame.java). Folder resources must be put inside your project folder (Ex8_xxx)

Complete the source file to make the program work as follows:

This program works with 2 backgrounds (Sunny and Rainy), poppinsLabel with 2 modes (Walking and Flying), and umbrellaLabel

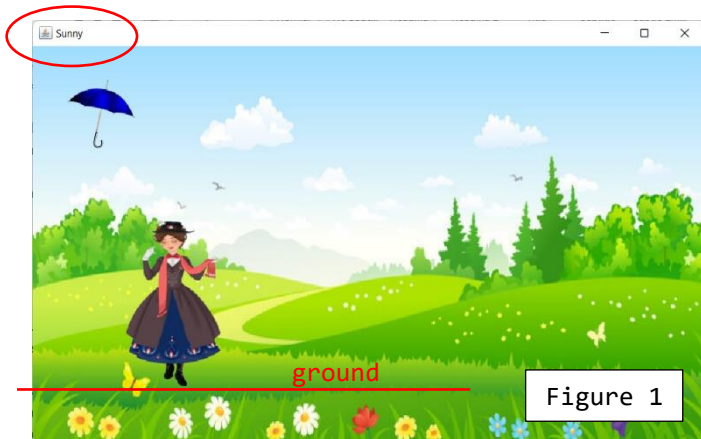


Figure 1

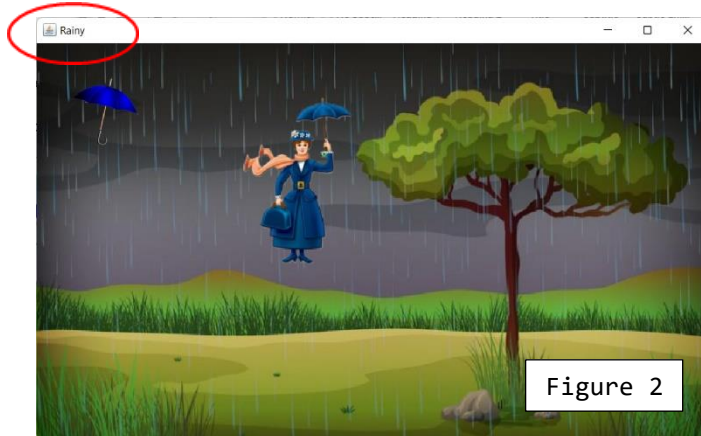


Figure 2

1. Background

- 1.1 Alphabet key S: background switches to Sunny & Poppins switches to Walking (not holding umbrella and getting back to ground location), as Figure 1
- 1.2 Alphabet key R: background switches to Rainy & Poppins switches to Flying (holding umbrella), as Figure 2
- 1.3 Title bar must show correct background

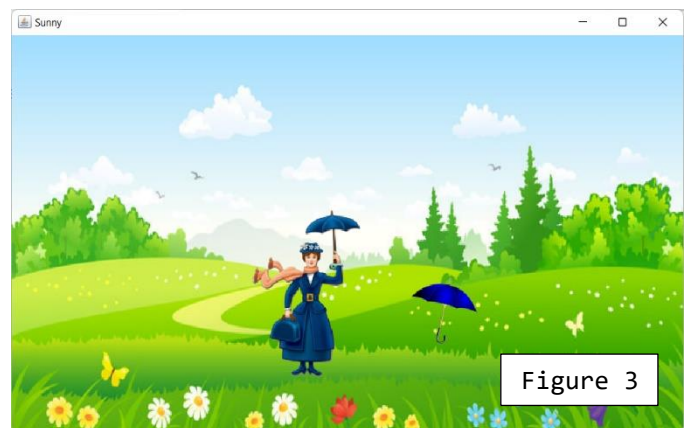


Figure 3

2. Umbrella

- 2.1 Umbrella can be dragged within the frame area (in both Sunny & Rainy) by using mouse
- 2.2 If it is dragged to touch the Walking Poppins, Poppins can switch to Flying without changing the background, as Figure 3
- 2.3 But if it is dragged to the Flying Poppins or the Walking/Flying Poppins moves to touch the umbrella, nothing will happen

3. Poppins

- 3.1 The Walking Poppins can only move left/right by using arrow keys LEFT/RIGHT. When she reaches one side of the frame, she'll appear on the opposite side
- 3.2 The Flying Poppins can move left/right by using arrow keys LEFT/RIGHT as in (3.1), and move up/down by using arrow keys UP/DOWN but only within the frame area

4. Complete `class PoppinsFrame 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 is poppinsLabel

- 4.1 Add methods to make activeLabel move by calling its methods (e.g. moveUp, moveDown, moveLeft, moveRight)
- 4.2 Add methods to switch between Sunny/Rainy (e.g. setting background and title bar)
- 4.3 Add variables/methods or make further modifications as needed

5. Complete `class ToggleLabel extends MoveLabel`. We will create poppinsLabel from this class

- 5.1 Add methods to update its location according to its move conditions (e.g. moveUp, moveDown, moveLeft, moveRight, updateLocation)
- 5.2 Add methods to switch between Waking/Flying (e.g. setting icon and move conditions)
- 5.3 Add variables/methods or make further modifications as needed

6. Complete `class DragLabel extends MoveLabel implements MouseMotionListener`. We will create umbrellaLabel from this class

- 6.1 Add methods to update label position according to its move conditions. Also check that if it overlaps with the activeLabel, set the activeLabel to Flying mode

```
// use parentFrame.getActiveLabel() to get activeLabel  
  
if ( label_1.getBounds().intersects(label_2.getBounds()) )  
    System.out.println("label 1 overlaps with label 2");
```

- 6.2 Add variables/methods or make further modifications as needed