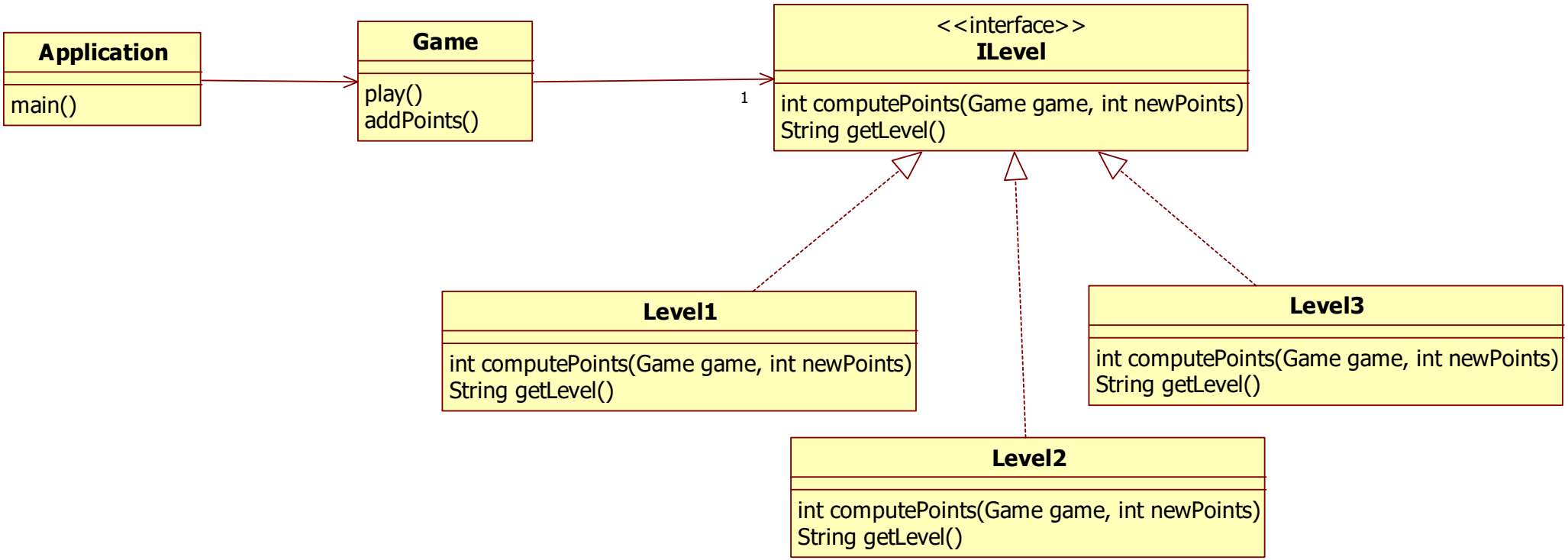
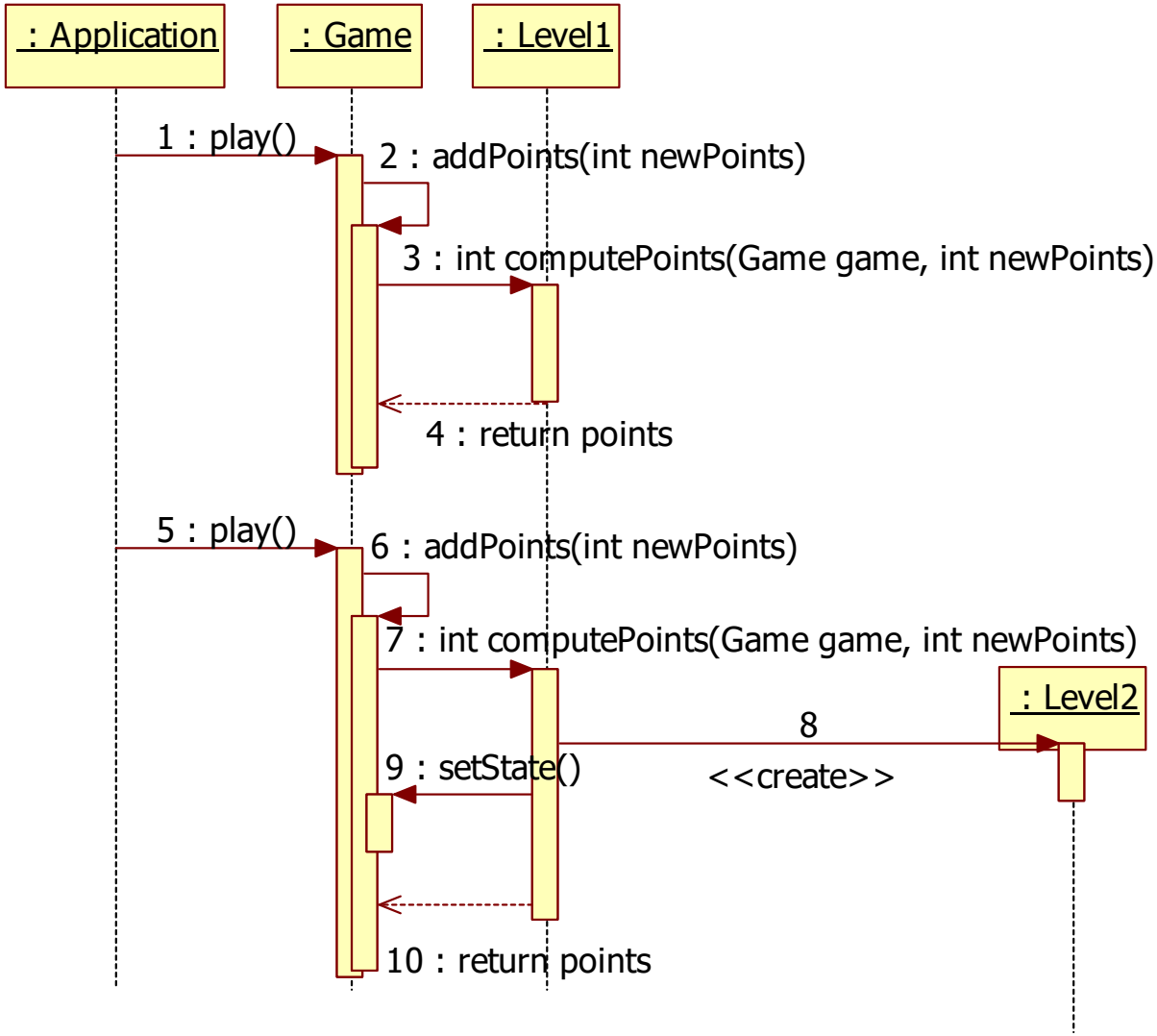
Lab 5

```
public class Game {
  private int totalPoints = 0;
  private int level = 1;

  public void play() {
    Random random = new Random();
    addPoints(random.nextInt(7));
    System.out.println("points="+totalPoints+" level="+level);
  }

  public int addPoints(int newPoints) {
    if (level == 1) {
      totalPoints = totalPoints + newPoints;
      if (totalPoints > 10) { // move to level 2
        level = 2;
        totalPoints = totalPoints + 1;//add 1 bonus point
      }
    } else if (level == 2) {
      totalPoints = totalPoints + 2 * newPoints;
      if (totalPoints > 20) { // move to level 3
        level = 3;
        totalPoints = totalPoints + 2; //add 2 bonus points
      }
    } else if (level == 3) {
      totalPoints = totalPoints + 3 * newPoints;
    }
    return totalPoints;
  }
}
```

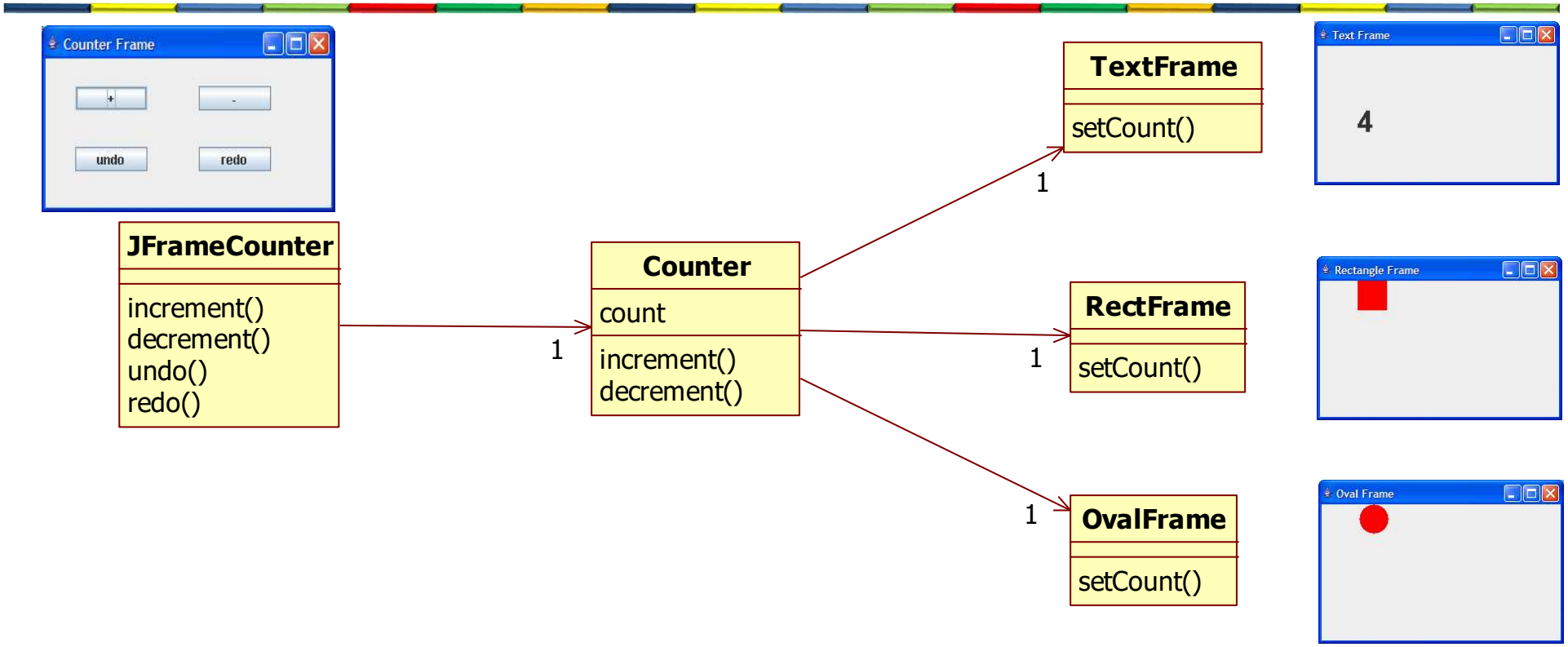
Lab 5 a


Application
main()
Game
play()
addPoints()
1
<<interface>>
ILevel
int computePoints(Game game, int newPoints)
String getLevel()
Level1
int computePoints(Game game, int newPoints)
String getLevel()
Level2
int computePoints(Game game, int newPoints)
String getLevel()
Level3
int computePoints(Game game, int newPoints)
String getLevel()

Lab 5 b

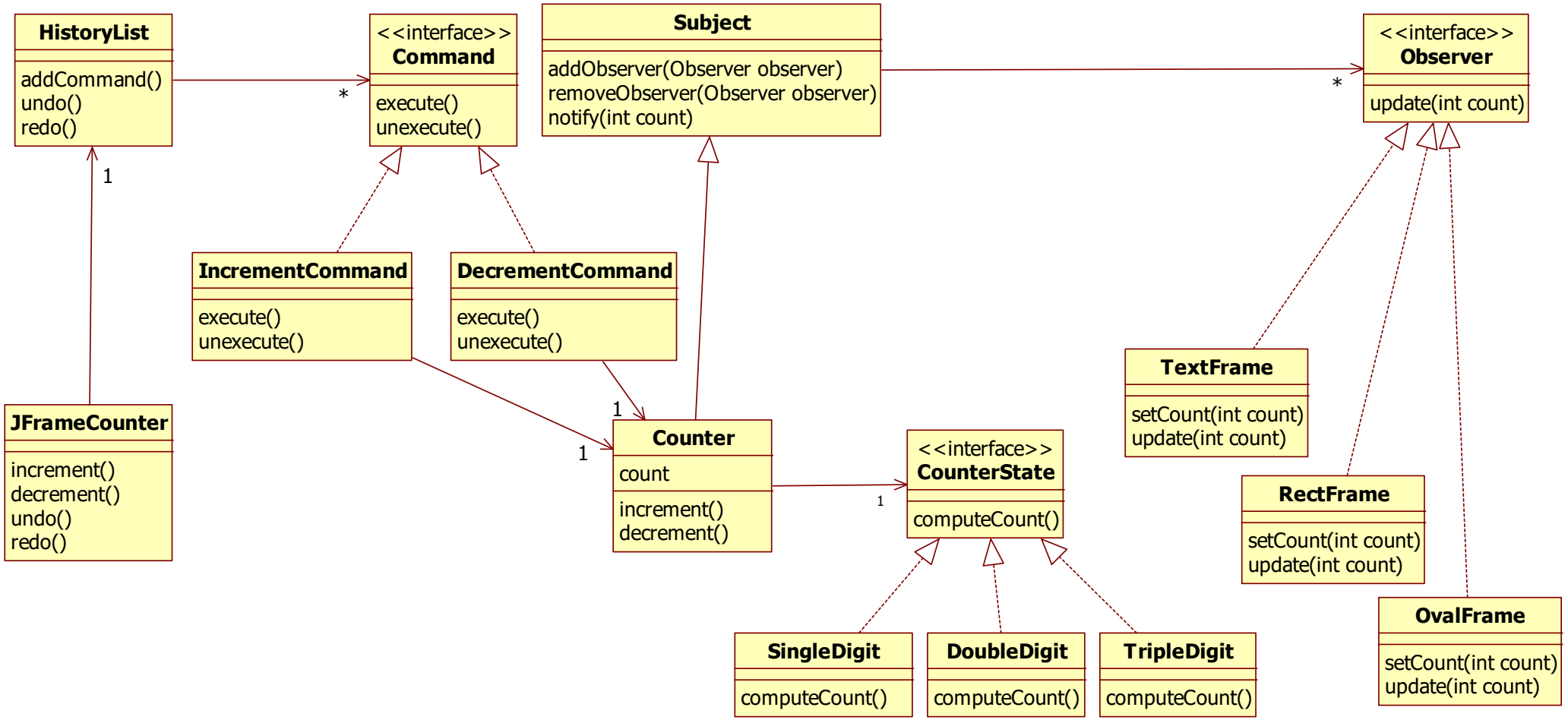

: Application
: Game
: Level1
1 : play()
2 : addPoints(int newPoints)
3 : int computePoints(Game game, int newPoints)
4 : return points
5 : play()
6 : addPoints(int newPoints)
7 : int computePoints(Game game, int newPoints)
: Level2
8
<<create>>
9 : setState()
10 : return points

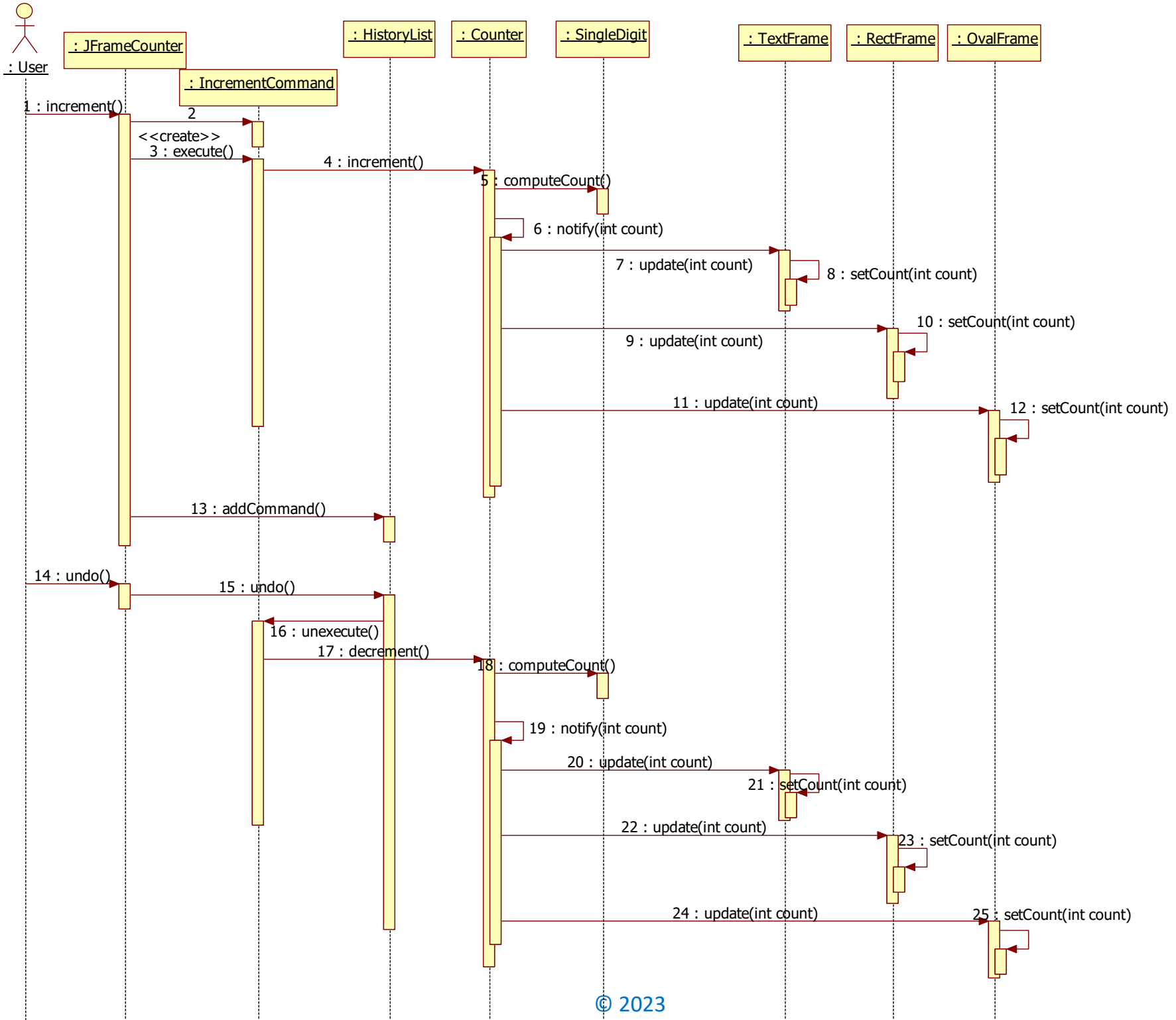
Lab 6 d



- Now we want to add the following functionality to this application:
  - When the Counter value is a single digit number, then every button action (increment and decrement) will add or subtract 1 point from the current teller Counter.
  - When the Counter value is a double digit number, then every button action (increment and decrement) will add or subtract 2 points from the current Counter value.
  - When the Counter value is a triple digit number, then every button action (increment and decrement) will add or subtract 3 points from the current Counter value.

Lab 6 d


HistoryList
addCommand()
undo()
redo()
<<interface>>
Command
execute()
unexecute()
Subject
addObserver(Observer observer)
removeObserver(Observer observer)
notify(int count)
<<interface>>
Observer
update(int count)
IncrementCommand
execute()
unexecute()
DecrementCommand
execute()
unexecute()
JFrameCounter
increment()
decrement()
undo()
redo()
Counter
count
increment()
decrement()
<<interface>>
CounterState
computeCount()
TextFrame
setCount(int count)
update(int count)
RectFrame
setCount(int count)
update(int count)
OvalFrame
setCount(int count)
update(int count)
SingleDigit
computeCount()
DoubleDigit
computeCount()
TripleDigit
computeCount()
1
*
*
1
1
1
1


: User
: JFrameCounter
: IncrementCommand
: HistoryList
: Counter
: SingleDigit
: TextFrame
: RectFrame
: OvalFrame
1 : increment()
2
<<create>>
3 : execute()
4 : increment()
5 : computeCount()
6 : notify(int count)
7 : update(int count)
8 : setCount(int count)
9 : update(int count)
10 : setCount(int count)
11 : update(int count)
12 : setCount(int count)
13 : addCommand()
14 : undo()
15 : undo()
16 : unexecute()
17 : decrement()
18 : computeCount()
19 : notify(int count)
20 : update(int count)
21 : setCount(int count)
22 : update(int count)
23 : setCount(int count)
24 : update(int count)
25 : setCount(int count)