Ask me anything

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6 questions
0 upvotes

What safety problems could arise if BalkingBoundedCounter were not fully synchronized?

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```
public class BalkingBoundedCounter implements BalkingCounter {
    protected long count = BoundedCounter.MIN;  // from MIN to MAX
    protected int errors = 0;
    public synchronized long value() { return count; }
    public synchronized void inc() throws BalkingException {
        if (count >= BoundedCounter.MAX) {
            throw new BalkingException("cannot increment");
        }
        ++count;
        checkInvariant();
    }
    public synchronized void dec() throws BalkingException {...}
    protected void checkInvariant() {...}
    public int errors() { return errors; }
}
```

It could increase count over the defined BoundedCounter.MAX

the bounds could not be respected

Since the buffer is bounded, without synchronization, two threads may simultaneously use the last buffer and exceed the size?

Increment could result in a count higher than BoundenCounter.MAX

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What could go wrong with the synchronized BatchArray.updateAll() method?

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```
public class BatchArray<Value> extends ExpandableArray<Value> {
    public BatchArray(int initialSize) { super(initialSize); }
    public BatchArray() { super(); }
    public synchronized void updateAll(Mutator<Value> p) {
        for (int i = 0; i < size; ++i) {
            data[i] = p.update(data[i]);
        }
    }
}
```

we could have a liveness issue

What if p is not synchronized and changes state internally when used in another thread?

It is a very long critical section

What if the thread yields in between

data.length > size

If p throws, we might end up with inconsistent data in the array.

the data may be updated at the same time as the data is accessed.

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DEMO: BatchArray.updateAll() without synchronization

Which safety pattern would you use to implement: RGB colours that can be mixed ?

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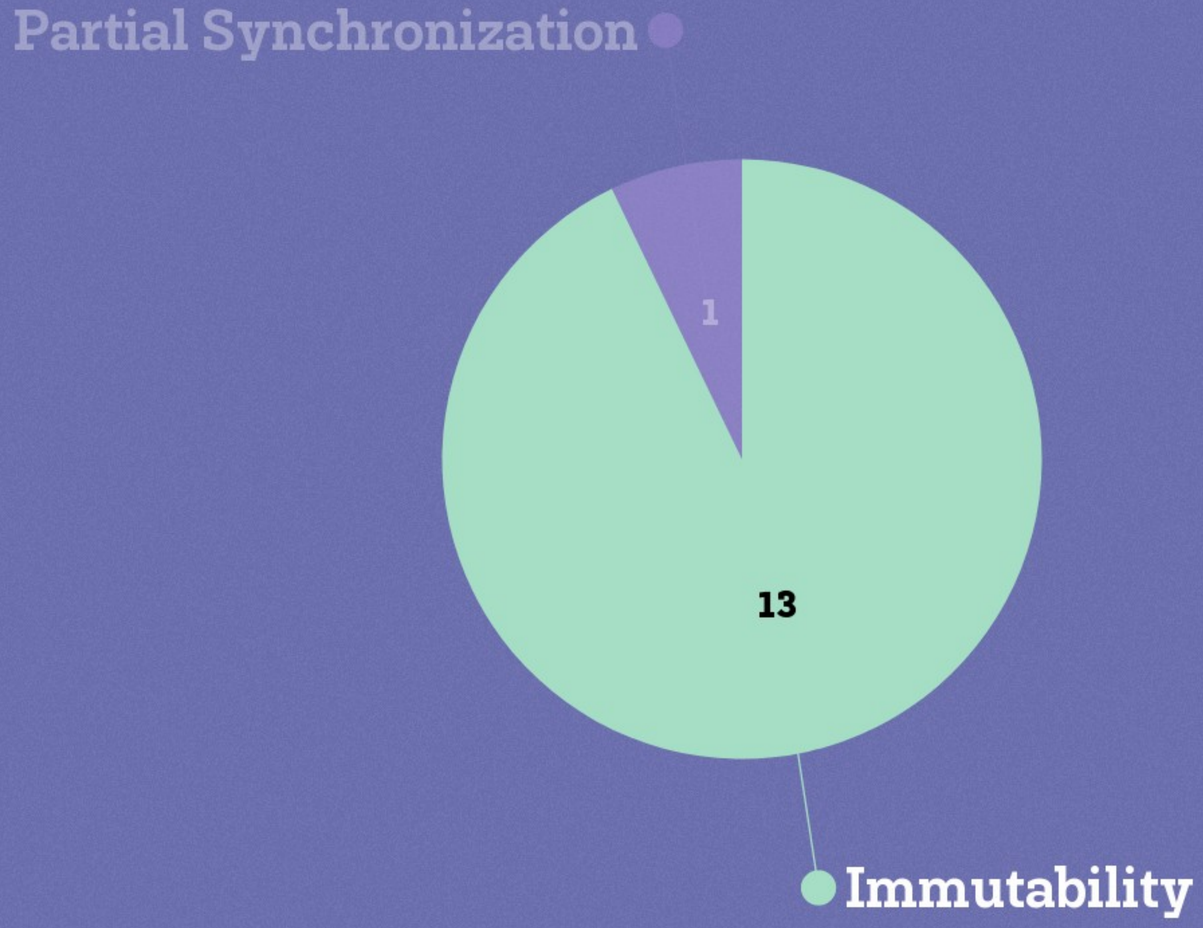

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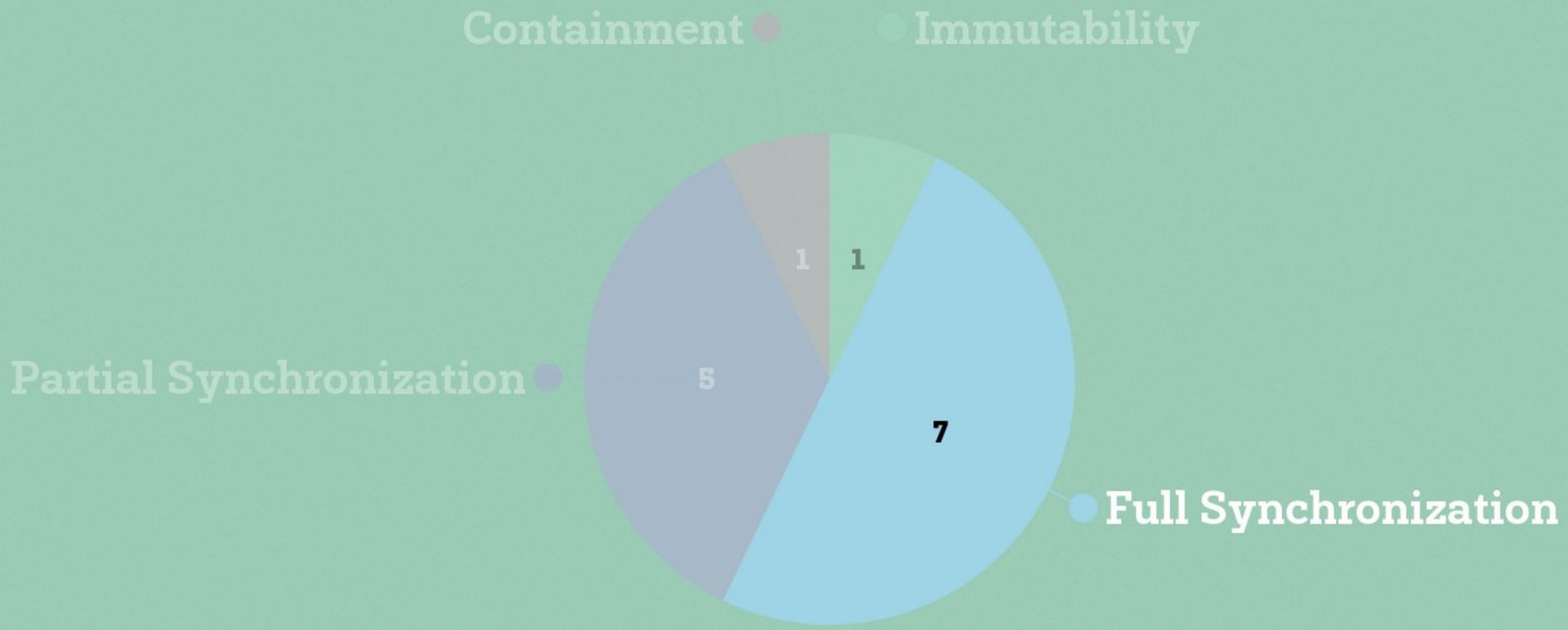
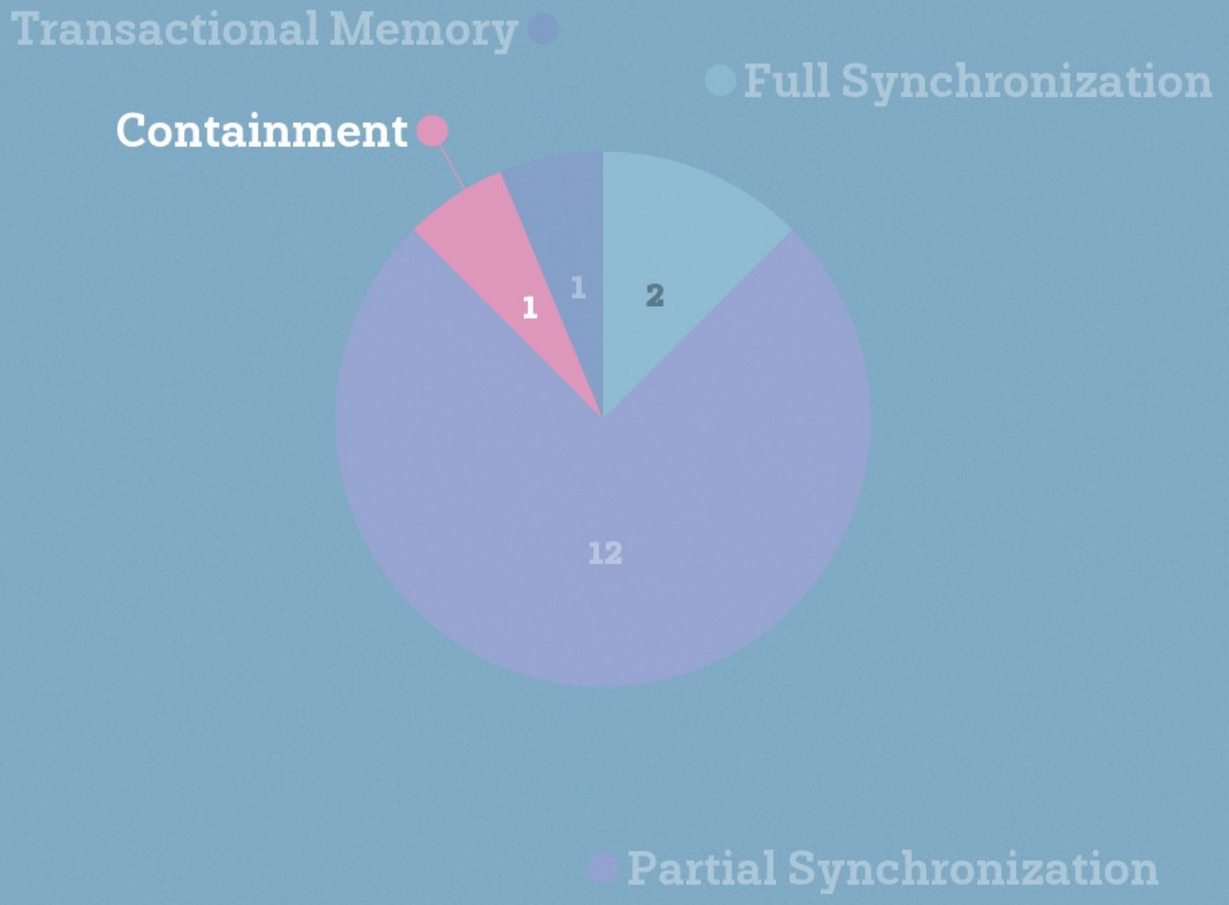
Which safety pattern would you use to implement: An updatable data cell ?



14

Which safety pattern would you use to implement: Collaborative game where players build a scene with sets of pieces ?



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Which safety pattern would you use to implement: A traversable tree data structure ?

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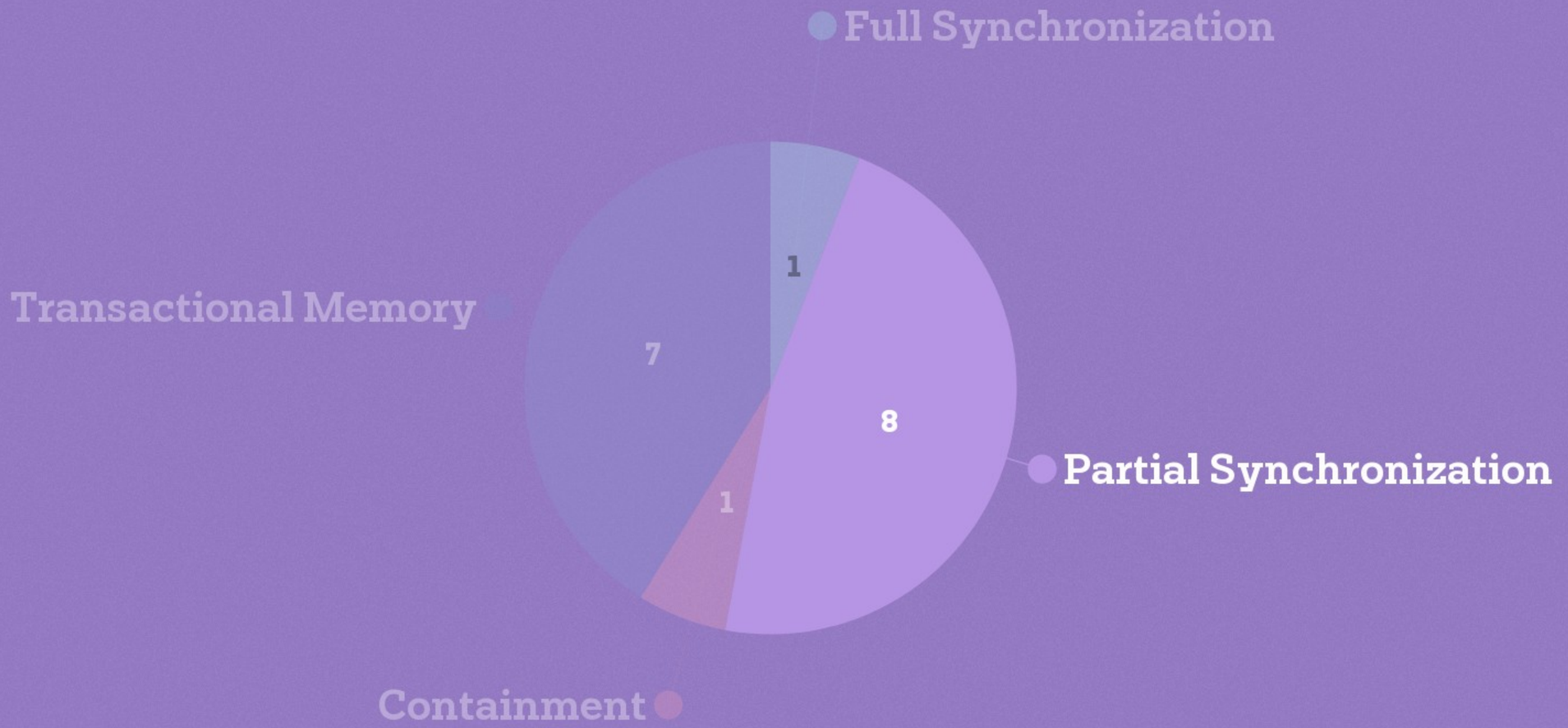

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Which safety pattern would you use to implement: Fixed shapes (circles, squares) that can be combined to create new Shapes ?

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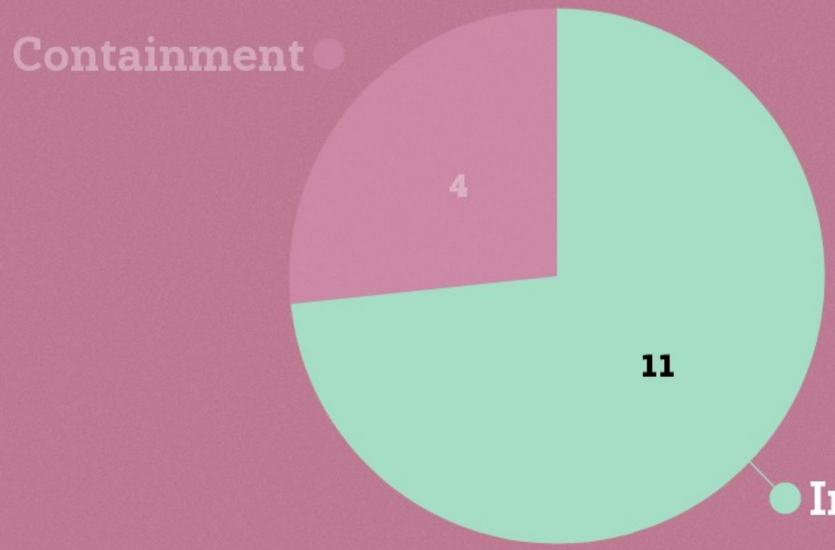

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Last chance for questions