Four Patterns

We've now seen four common patterns in parallel code

- 1. Map
- 2. Reduce
- 3. Prefix
- 4. Pack (a.k.a. Filter)

21

Amdahl's Law

Suppose our program takes 100 seconds. And S is 1/3 (i.e. 33 seconds).

What is the running time with

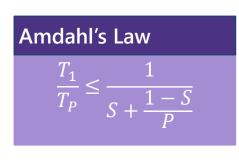
3 processors

6 processors

22 processors

67 processors

1,000,000 processors (approximately).



Bad Interleaving

```
void withdraw(int amount){void withdraw(int amount){
    int b = getBalance();
    if(amount > b)
    throw new ...;
    setBalance(b-amount);
    }
}
```

42

Bad Interleaving

There's still a bad interleaving. Find one.

```
void withdraw(int amount){ void withdraw(int amount){
    int b = getBalance();
    if(amount > getBalance())
    throw new ...;
    setBalance(
        getBalance()-amount);
    }
}
```