Quiz(Midterm 2) Prep Week 15

Concepts for week 15

- Generics
- Streams
- Kotlin! (optional)

Other topics for this midterm

- Big-O, Type parameters, ArrayList/LinkedList, Inner class (see week 9 review)
- Hashing, Maps, Exceptions, Internet Stuff (see week 11 review)
- Recursion, Trees (see week 12 review)
- Sorting algorithms, Binary Search (see week 14 review)

EMP Session Links

Generics

1. What is a classic usage of generic in Java (*Hint: you put items in it, you can extend it or shrink it, ...*)?

▶ Spoiler!

2. What are the conventional names of generics for number/element/key/value?

▶ Spoiler!

3. How do we change the following class definition to use generics?

```
public class MyList {
  private List<Object> list;
  private int size;
  public MyList(int setSize) {
    size = setSize;
    list = new ArrayList(setSize);
  }
}
```

▶ Spoiler!

```
public class MyList<E> {
  private List<E> list;
  private int size;
  public MyList(int setSize) {
    size = setSize;
    list = new ArrayList(setSize);
  }
}
```

4. Can you implement generics on array in Java?

▶ Spoiler!

Streams

1. Convert the following for loop to stream.

```
int count = 0;
for (int i = 0; i < 5; i++) {
  if (i % 3 == 0) {
    count += 1;
  }
}
```

▶ Spoiler!

```
int count = Stream.of(1, 2, 3, 4, 5)
  .filter(e -> e % 3 == 0)
  .count();
```

2. What does the following stream do?

```
int mystery = Stream.of(1, 2, 3, 4, 5)
  .filter(e -> e % 3 != 0)
  .reduce(1, (a, b) -> a * b);
System.out.println(mystery);
```

▶ Spoiler!

3. Why do we use Streams?

More succinct, composable, efficient.