Subtyping and Arrays

Does $B \subseteq A$ imply $B[] \subseteq A[]$?

Java’s Array Subtyping Rule

Static type checking: $B \subseteq A \Rightarrow B[] \subseteq A[]$

Need a run-time check for every array store to an array where the actual element type is not known.
Generic Subtyping

Does $B \subseteq A$ imply $T^B \subseteq T^A$?

```
List<String> as;
List<Object> ao;
```

```
List<String> as;
List<Object> ao;
```

Type mismatch: cannot convert from List<String> to List<Object>

Type mismatch: cannot convert from List<Object> to List<String>

Generic Subtyping: Novariant

```
List<String> as;
List<Object> ao;
```

```
ao = as;
as = ao;
```

Wildcard Types!

```
List<? extends Object> ag;
```

```
ag = ao;
ag = as;
```

```
String s = ag.get(0);
```

Type mismatch: cannot convert from capture#3-of ? extends Object to String

Buzzword Description

“A simple, object-oriented, distributed, interpreted, robust, secure, architecture neutral, portable, high-performance, multithreaded, and dynamic language.”  [Sun95]

As the course proceeds, we will discuss how well it satisfies these “buzzwords”. You should especially be able to answer how well it satisfies each of the blue ones in your final interview.