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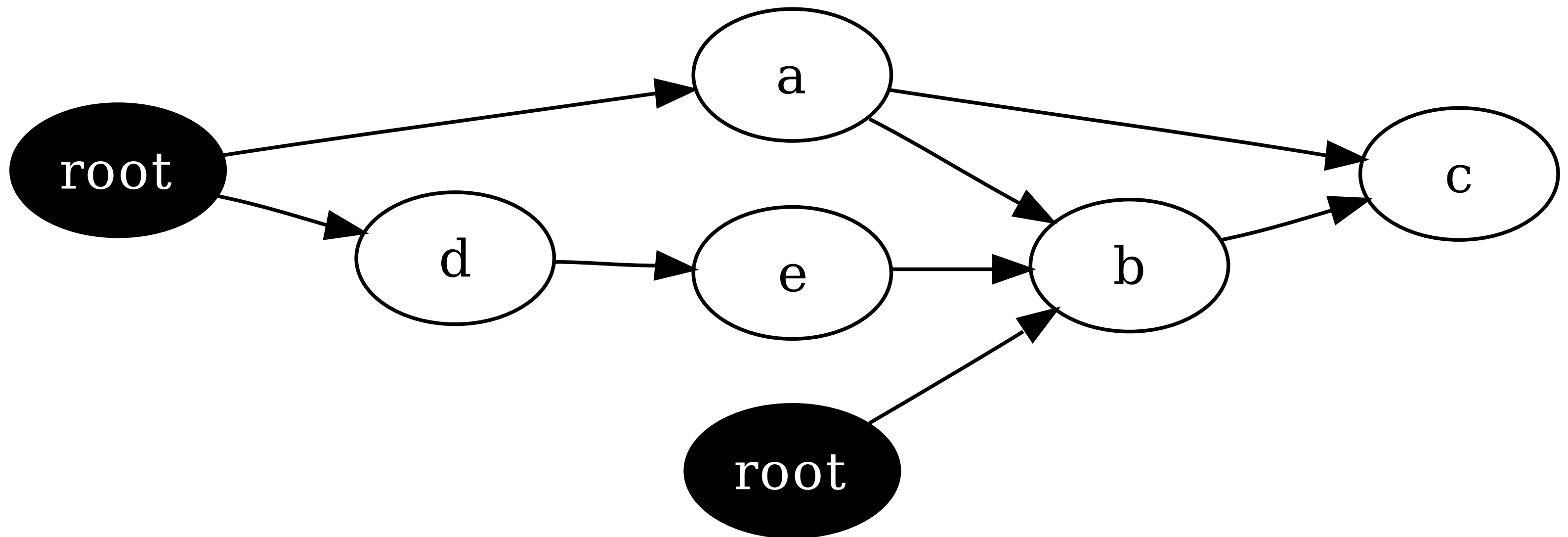


# JavaOne<sup>SM</sup>

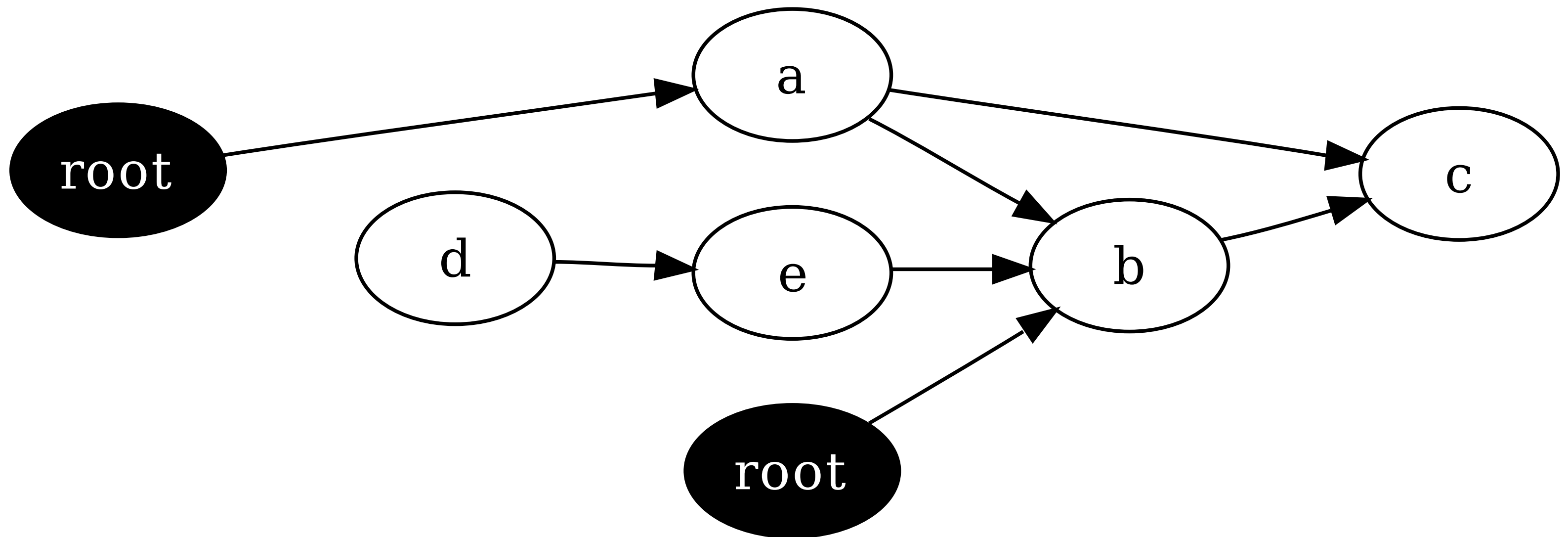
## The Ghost in the Virtual Machine A Reference to References

Bob Lee  
Google Inc.

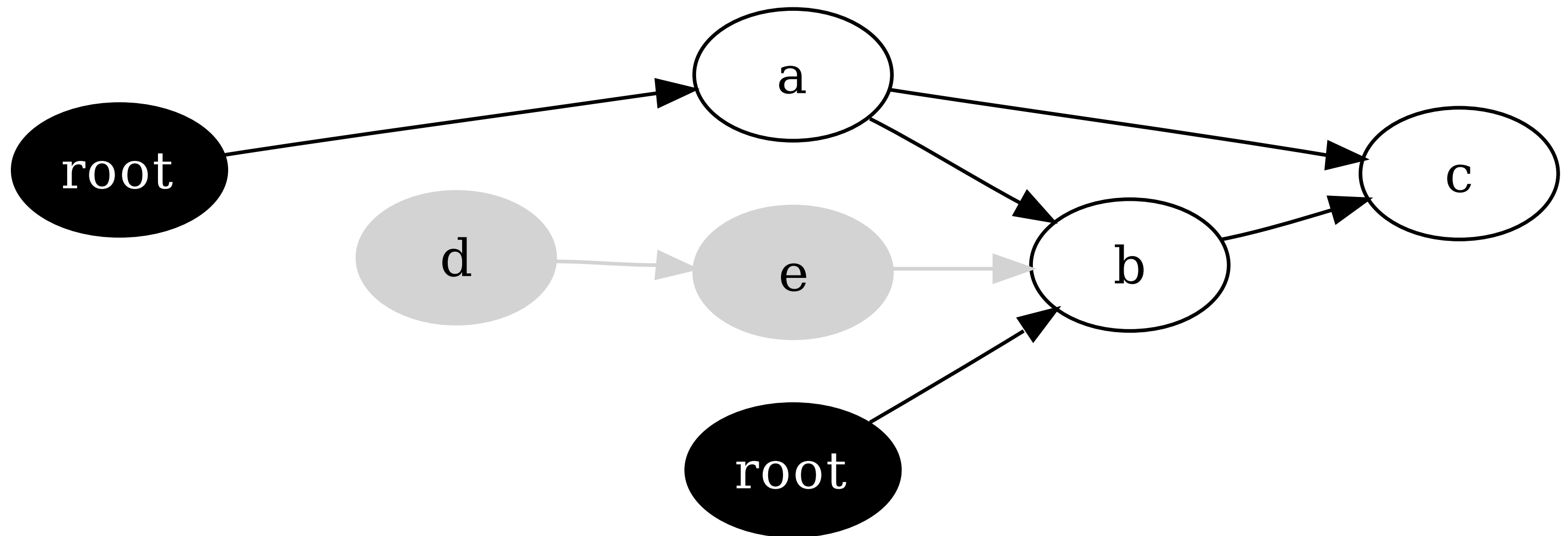
# Garbage Collection



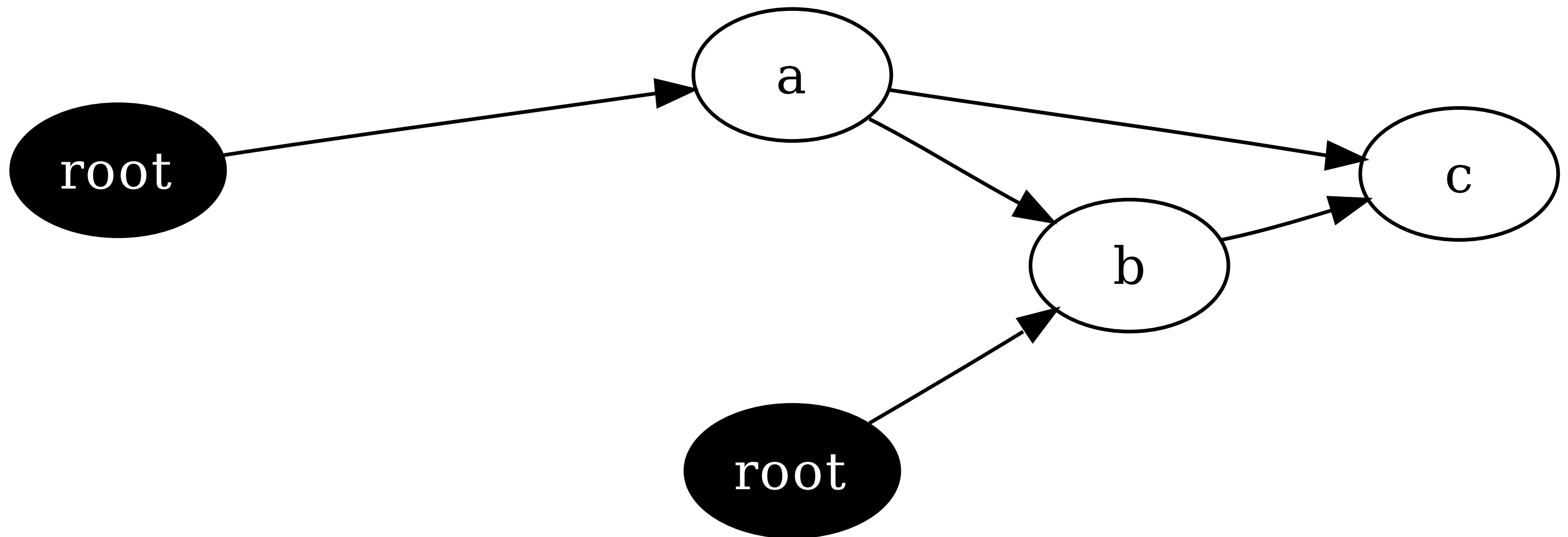
# Garbage Collection



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# Object Reachability

- > An object is `_reachable_` if a live thread can access it.
- > Examples of heap roots:
  - System classes (which have static state)
  - Thread stacks
  - In-flight exceptions
  - JNI global references
  - The finalizer queue
  - Interned strings
  - etc. (VM-dependent)



# In the beginning, there was the finalizer...

```
public class Foo extends Bar {  
    @Override protected void finalize() throws Throwable {  
        try {  
            ... // Clean up Foo.  
        } finally {  
            super.finalize(); // Clean up Bar.  
        }  
    }  
}
```

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```



# Hello, World!

