PYTHON OPTIMIZATIONS

INTERNING

Important Note:

A lot of what we discuss with memory management, garbage collection and optimizations, is usually specific to the Python implementation you use.

In this course, we are using CPython, the standard (or reference) Python implementation (written in C).

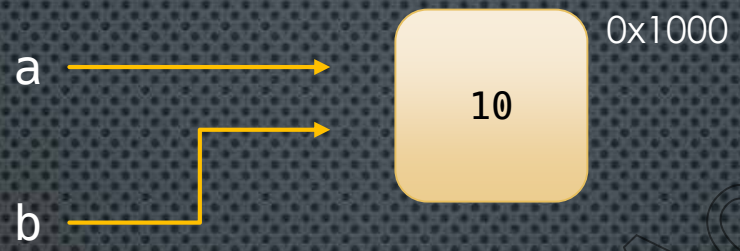
But there are other Python implementations out there. These include:

- Jython – written in Java and can import and use any Java class – in fact it even compiles to Java bytecode which can then run in a JVM
- IronPython – this one is written in C# and targets .Net (and mono) CLR
- PyPy – this one is written in RPython (which is itself a statically-typed subset of Python written in C that is specifically designed to write interpreters)
- and many more…

https://wiki.python.org/moin/PythonImplementations

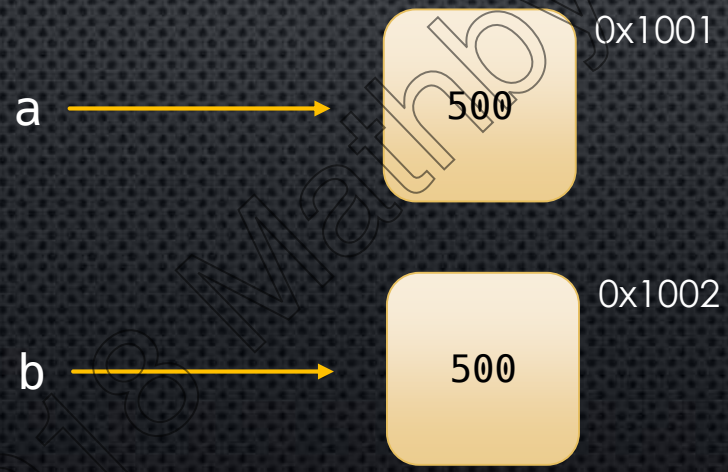
Earlier we saw:

```
a = 10
b = 10
```



But look at this:

```
a = 500
b = 500
```



In this case, although it would be safe for Python to create a shared reference, it does not!

What is going on?

Interning: reusing objects on-demand

At startup, Python (CPython), pre-loads (caches) a global list of integers in the range [-5, 256]

Any time an integer is referenced in that range, Python will use the cached version of that object

Singletons Optimization strategy – small integers show up often

When we write

```
a = 10
```

Python just has to point to the existing reference for 10

But if we write

```
a = 257
```

Python does not use that global list and a new object is created every time