

# Recap



COMP 524: Programming Language Concepts  
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**What are the two principle sources of memory waste in heap allocation?**

Internal and external fragmentation

# What is the referencing environment?

The set of all active bindings; all valid names.

# What is aliasing? Why can it be a problem?

Two names refer to the same object; hinders optimization since corner cases must be considered.

# What is an opaque export?

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# What is meant by the terms “module as a manager” and “module as a type.”

manager: exists only once; collection of definitions

type: multiple instances with private state can coexist.