

Project 2 -- GC

Last time

- Garbage Collection

Today

- How to implement a Mark and Sweep Garbage Collector
- Detailed example

Trace Collecting

Observation

- rather than explicitly keep track of the number of references to each object we can traverse all reachable objects and discard unreachable objects

Details

- start with a set of **root** pointers (program vars)
- global pointers
- pointers in stack and registers
- traverse objects recursively from root set
- visit **reachable** objects
- unvisited objects are garbage
- we might visit an object even if it's dynamically dead (ie, we are only conservatively approximating dead object discovery)

When do we collect?

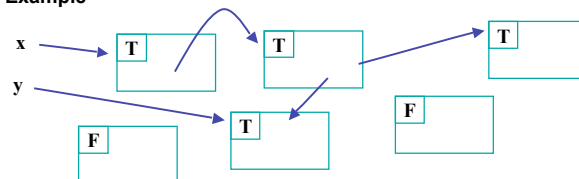
- when the heap is full

Mark-Sweep Collecting

Simple trace collector

- trace reachable objects marking reachable objects
- sweep through all of heap
- add unmarked objects to **free list**
- clear marks of marked objects

Example



Next Time

Wednesday

- CFG and liveness for register allocation

Assignments

- Make sure to turn in Project 1
- Start Project 2 ASAP