

CS383 Programming Languages

Quiz 8

1. Which is **not** a major area of the memory?

a. static area

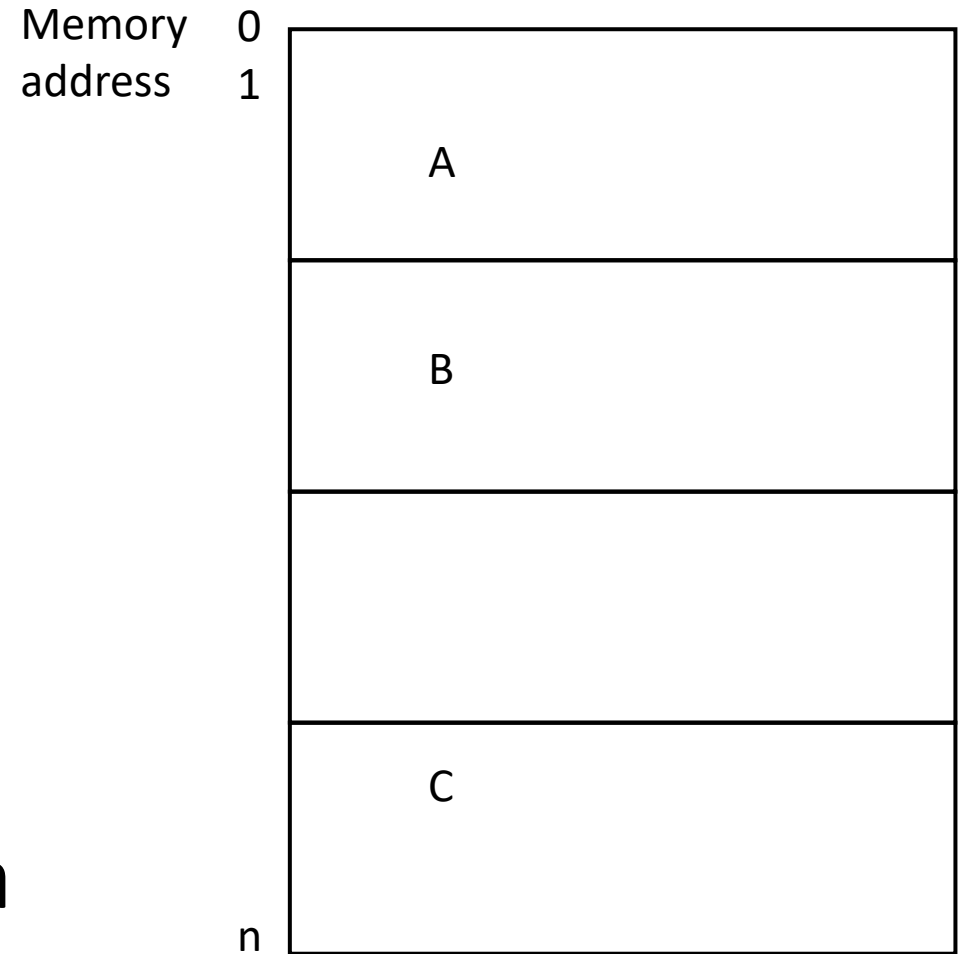
b. heap

c. free list

d. runtime stack

2. What is the structure of runtime memory?

- a. A: static area; B: stack; C: heap
- b. A: stack; B: static area; C: heap
- c. A: static area; B: stack; C: heap
- d. A: stack ; B: heap; C: static area



3. Runtime stack holds global variables that can be statically allocated.

a. True

b. False

4. Why don't we put the heap on the top of the address space?

Because this may lead to
memory overflow

5. Which of the following C/C++ statements doesn't allocate memory from Memory Heap?

a. `char s[] = "abc";`

b. `p = malloc (sizeof (int));`

c. `int* a = new int (4);`

d. `array[i] = new int [n];`

6. Garbage collection is ___?

- a. a syntactic component
- b. a semantic feature
- c. always invoked by programmer
- d. a practical consideration

GC and Programming Languages

- GC is not a language feature
- GC is a pragmatic concern for automatic and efficient heap management
 - Cooperative langs: Lisp, Scheme, Prolog, Smalltalk ...
 - Uncooperative languages: C and C++
 - But garbage collection libraries have been built for C/C++
- Recent languages have GC built-in:
 - Object-oriented languages: Modula-3, Java, C#, Python
 - In Java, runs as a low-priority thread; `System.gc` may be called by the program
 - Functional languages: ML and Haskell

7. Which of the following programming languages **doesn't** have inherent Garbage Collection mechanism?

a. Lisp

b. Scheme

c. C

d. Haskell

8. Which one is **not** a classical garbage collection strategy mentioned on class?

- a. Reference Counting
- b. Mark-and-Sweep
- c. Early Detection**
- d. Copy Collection

9. Which of the following is **incorrect** about Reference Counting?

- a. Its biggest defect is in its inability to deallocate circular structures.
- b. It is relatively easy to implement.
- c. Its cost is proportional to the size of the heap or to the percentage of it in use or not at any time.
- d. It comes with space overhead since additional space needed for reference count.

10. Which is **not** one of the disadvantages for the mark-and-sweep GC algorithm?

- a. Normal execution must be suspended.
- b. May touch all virtual memory pages.
- c. **Fail to detect inaccessible circular structure.**
- d. Heap may fragment.