CMSC131

The Call Stack and Parameters
What is a Stack?

• A stack is a data structure with two essential operations; push and pop.
  – push something onto a stack
  – pop the top thing off the stack

• A stack of plates is the common metaphor.

• The part of memory referred to as the stack uses this approach for allocating and releasing memory.
  – NOTE: Once allocated and on the memory stack, random access is possible. The "stack" behavior is just at the allocation level.
Stack Frames

- Our examples so far have been limited to a single method.
- When expanding to consider a series of method calls (and their completion) we extend our picture to include "frames" on the memory stack.
- Each method call places a new frame on the stack which contains:
  - The parameters and other local variables used by that method.
  - Other information used "internally" which we will not explore in this course.
public static void main(String[] args) {
Student s1 = new Student("Pat", 18, 987654321);
int val1 = 5;
Integer val2 = 25;

    System.out.println(
            s1 + " \tValue #1:"+ val1 + " Value #2:"+ val2
    );

messWithStudent(s1, val1, val2);

    System.out.println(
            s1 + " \tValue #1:"+ val1 + " Value #2:"+ val2
    );
}
public static void messWithStudent(
    Student localStudent,
    int x, Integer y
) {

    localStudent.useToken();

    localStudent = new Student("Sam", 345363267);
    localStudent.receiveTokens(x+y);

    x=0;
    y++;

    System.out.println(
        localStudent+" \\
        Value #1:"+x+" Value #2:"+y
    );
}

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