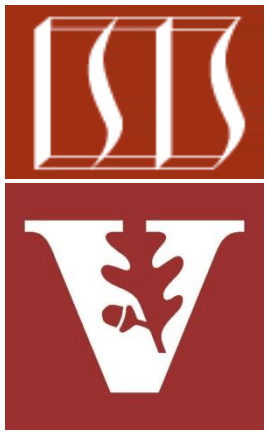
Java Threads:
Introduction to Threads

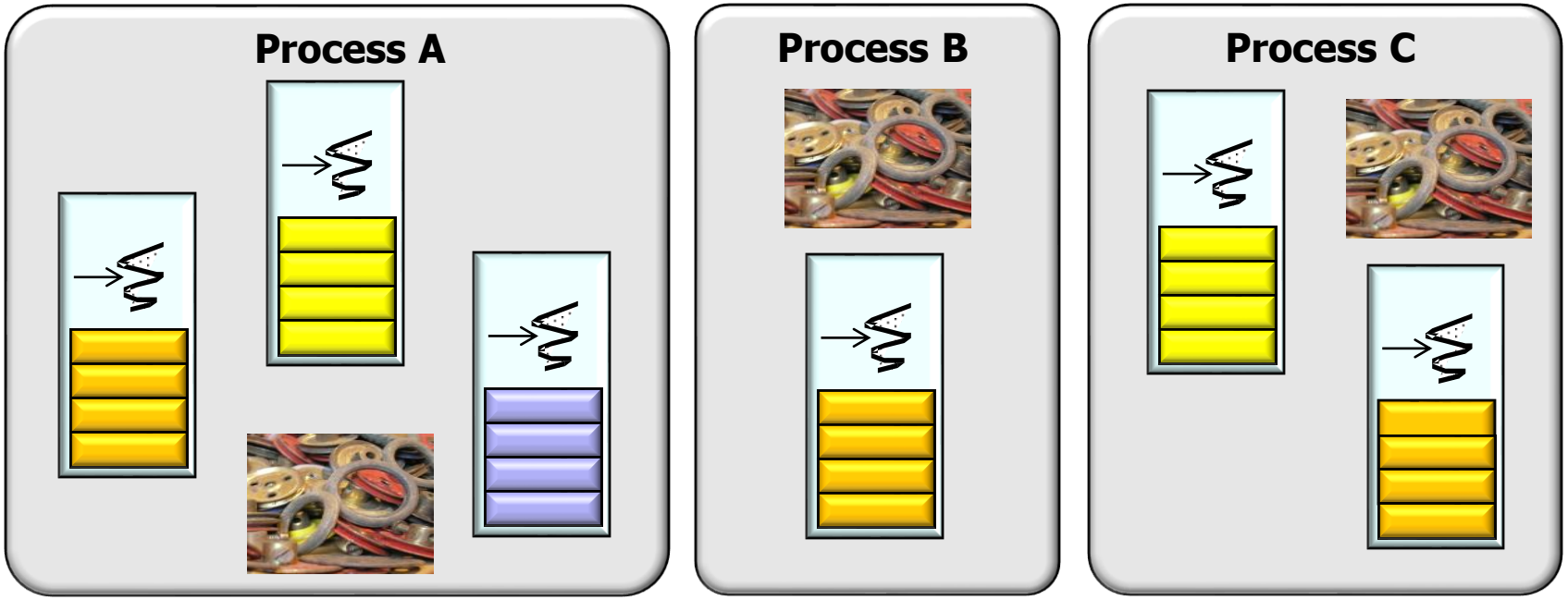


Douglas C. Schmidt
d.schmidt@vanderbilt.edu
www.dre.vanderbilt.edu/~schmidt

Institute for Software
Integrated Systems
Vanderbilt University
Nashville, Tennessee, USA

Learning Objectives in this Part of the Lesson

- Understand how Java threads support concurrency

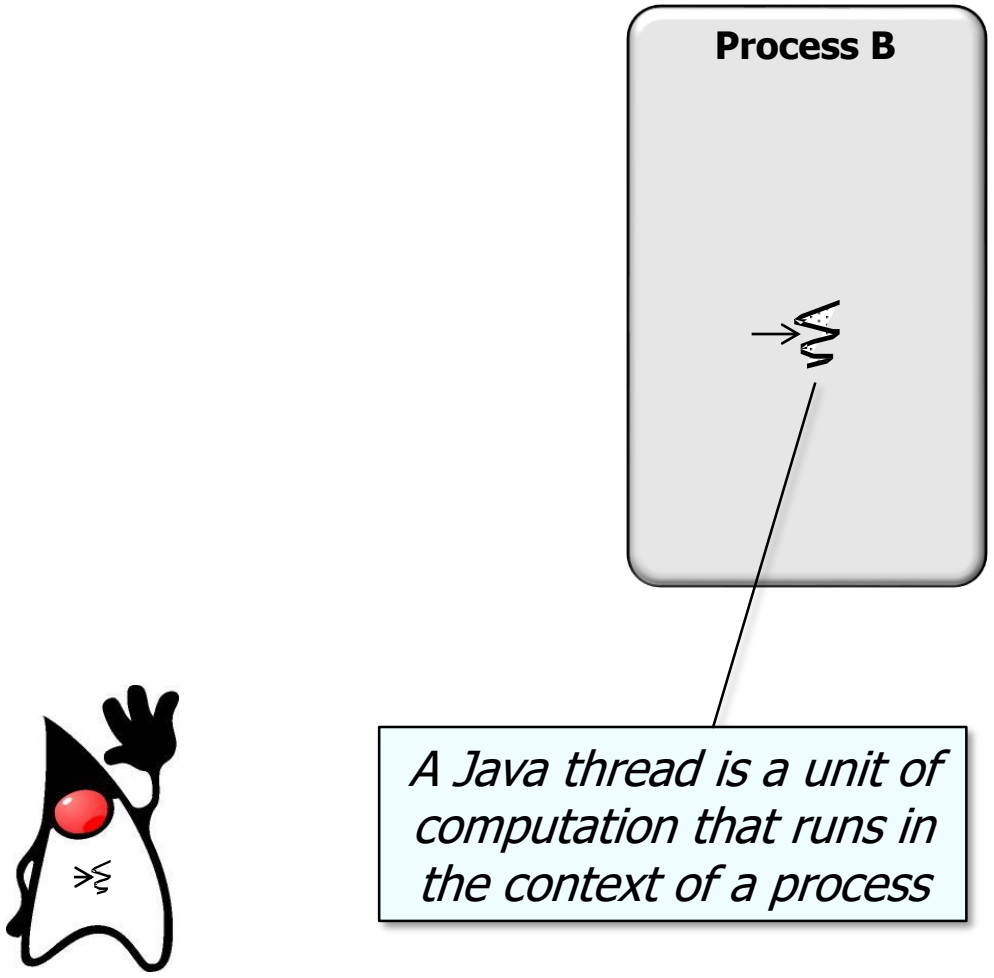


Concurrent apps use threads to simultaneously run multiple computations that potentially interact with each other

Introduction to Java Threads

Introduction to Java Threads

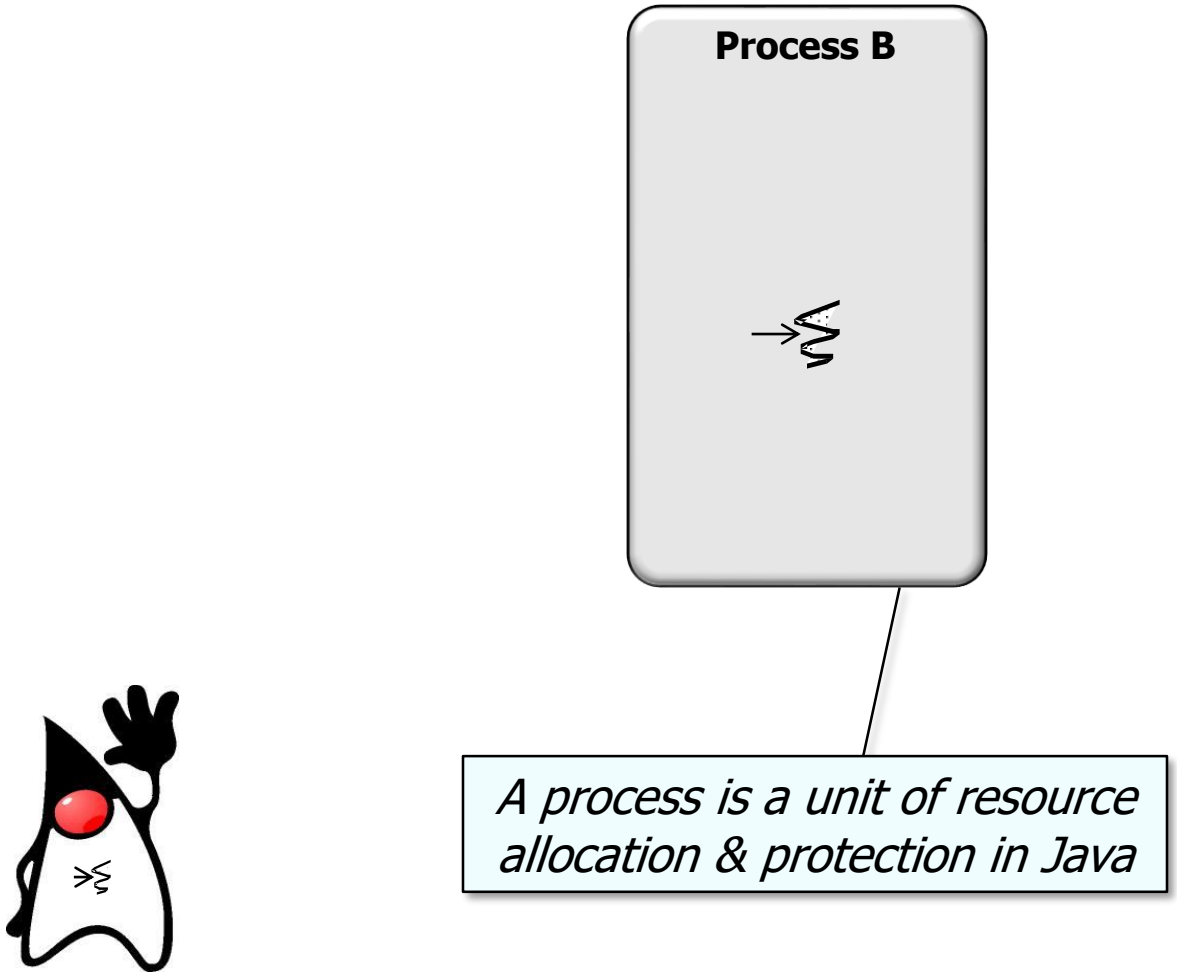
- Threads are the most basic way of obtaining concurrency in Java



See en.wikipedia.org/wiki/Thread_(computing)

Introduction to Java Threads

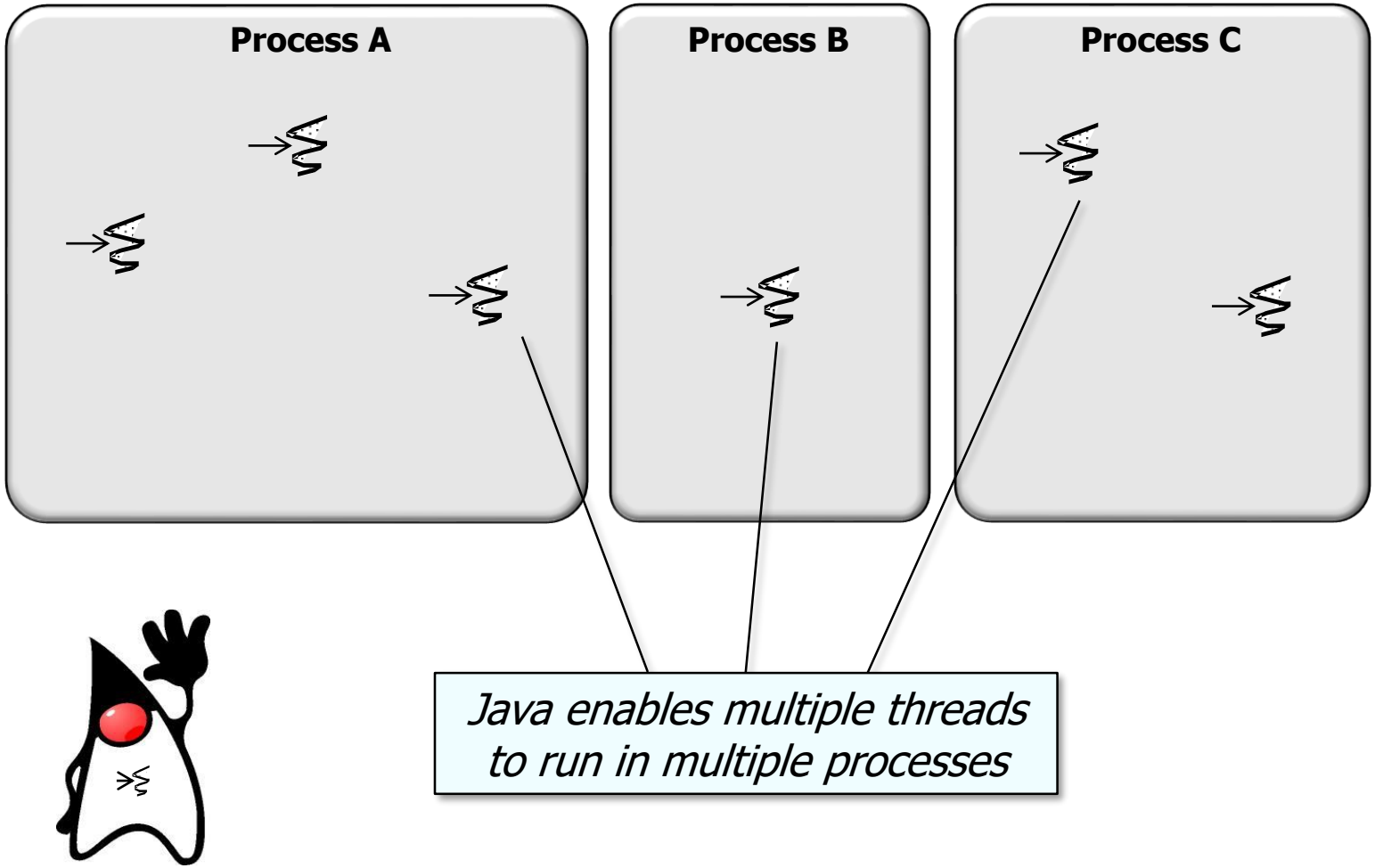
- Threads are the most basic way of obtaining concurrency in Java



See en.wikipedia.org/wiki/Process_(computing)

Introduction to Java Threads

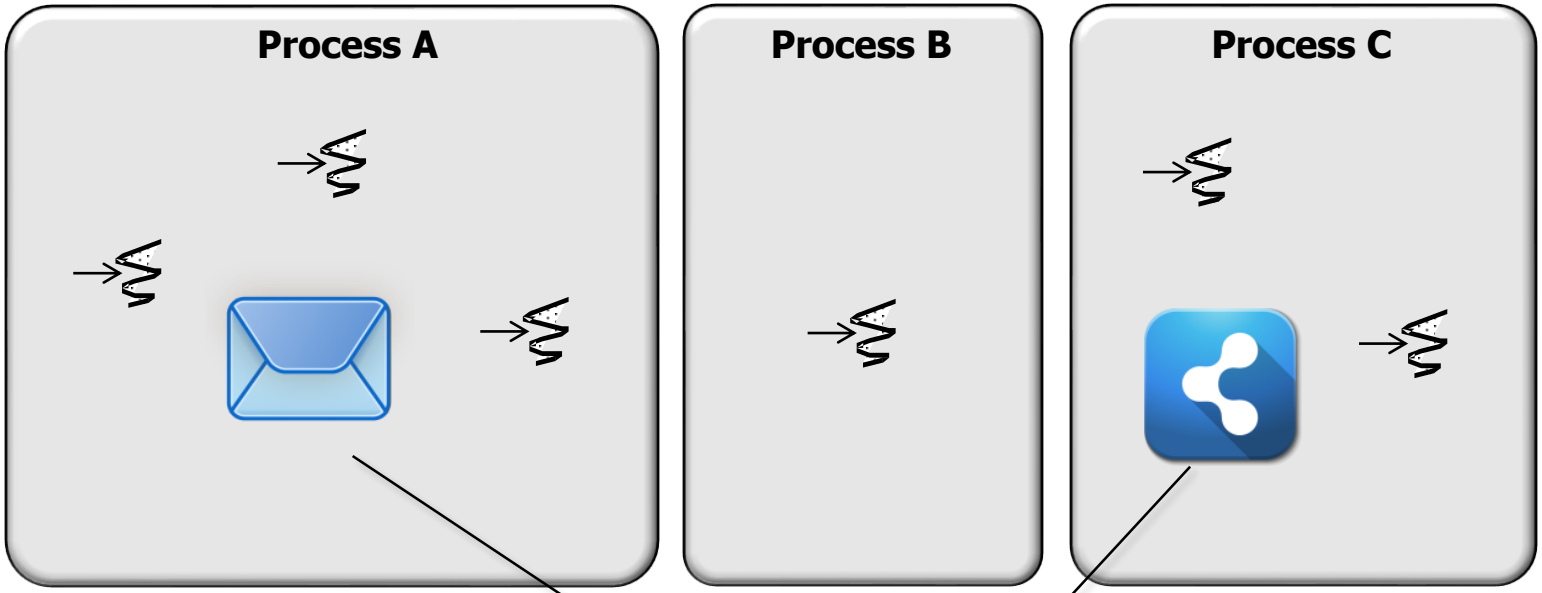
- Threads are the most basic way of obtaining concurrency in Java

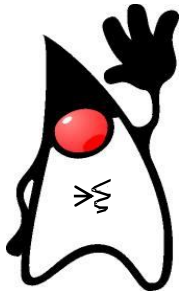


See docs.oracle.com/javase/tutorial/essential/concurrency/procthread.html

Introduction to Java Threads

- Threads are the most basic way of obtaining concurrency in Java



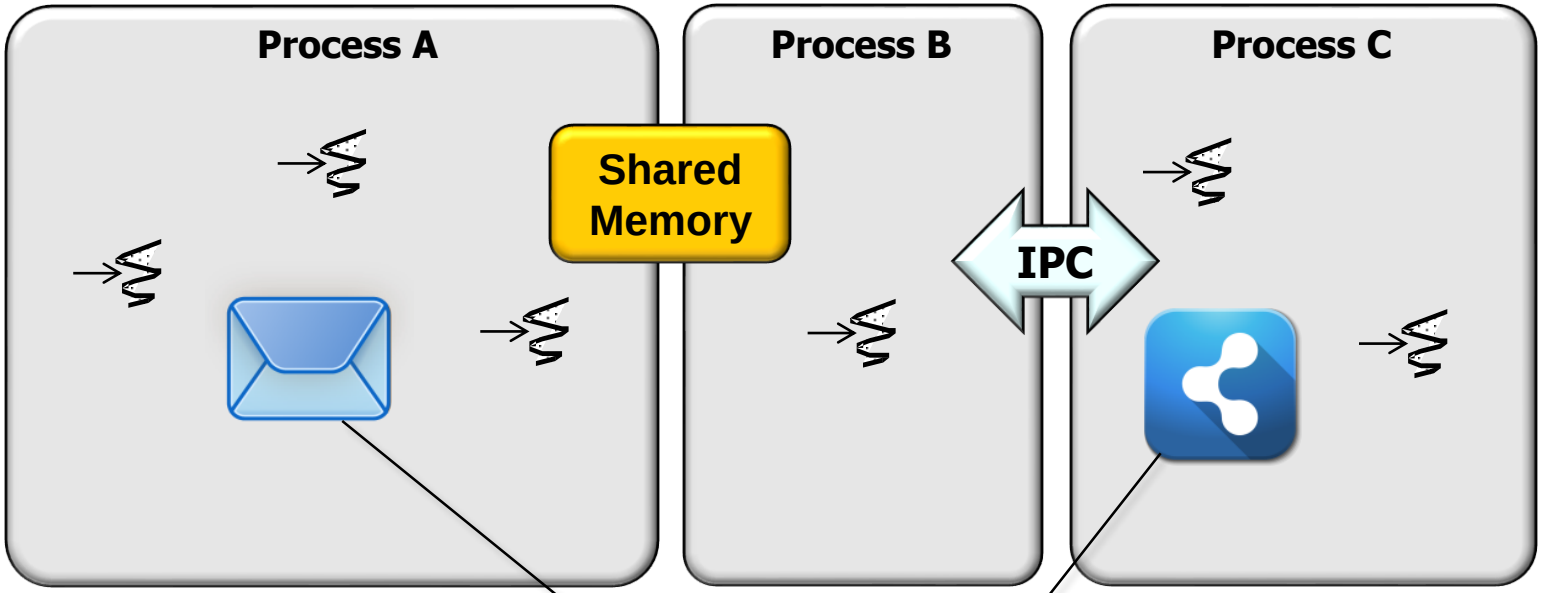


Java threads running in the same process can communicate with each other via shared objects or message passing

See www.javatpoint.com/inter-thread-communication-example & web.mit.edu/6.005/www/fa14/classes/20-queues-locks/message-passing

Introduction to Java Threads

- Threads are the most basic way of obtaining concurrency in Java

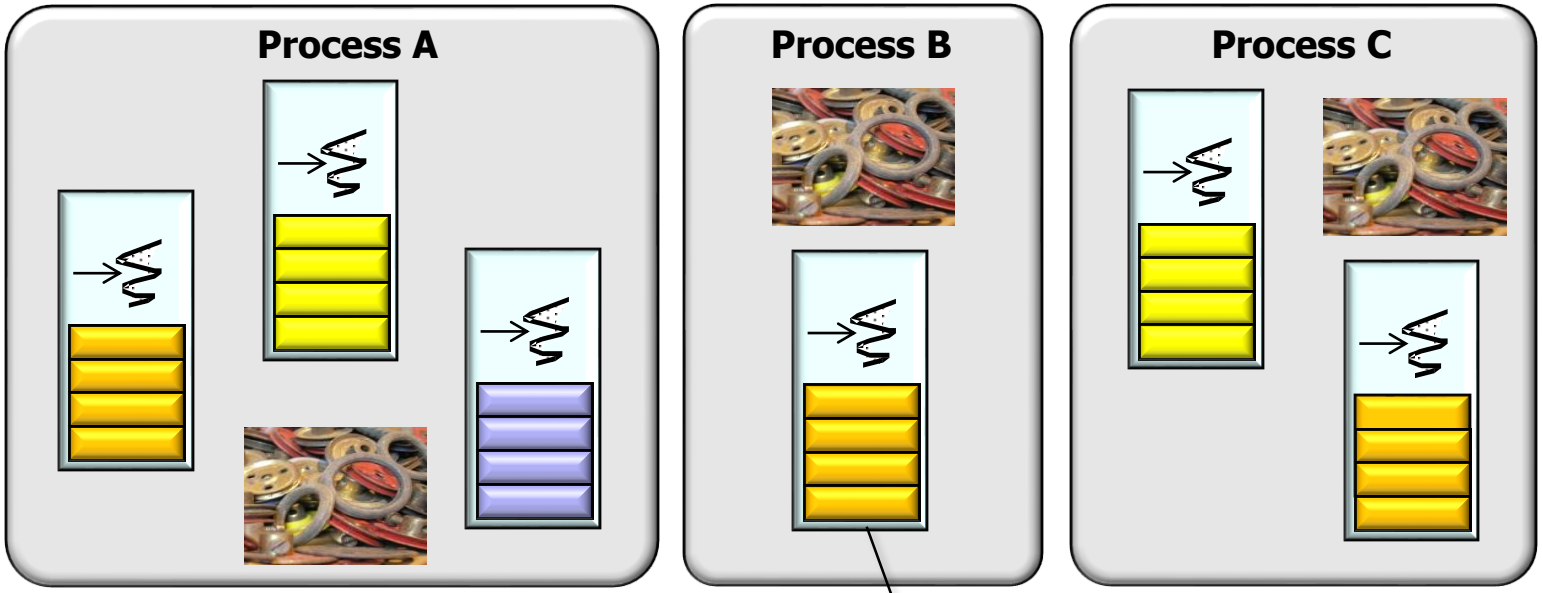


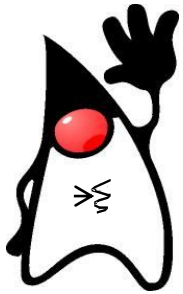
Java threads running in different processes can communicate with each other via shared memory or inter-process communication (IPC) mechanisms

See developer.android.com/guide/components/aidl

Introduction to Java Threads

- Threads are the most basic way of obtaining concurrency in Java



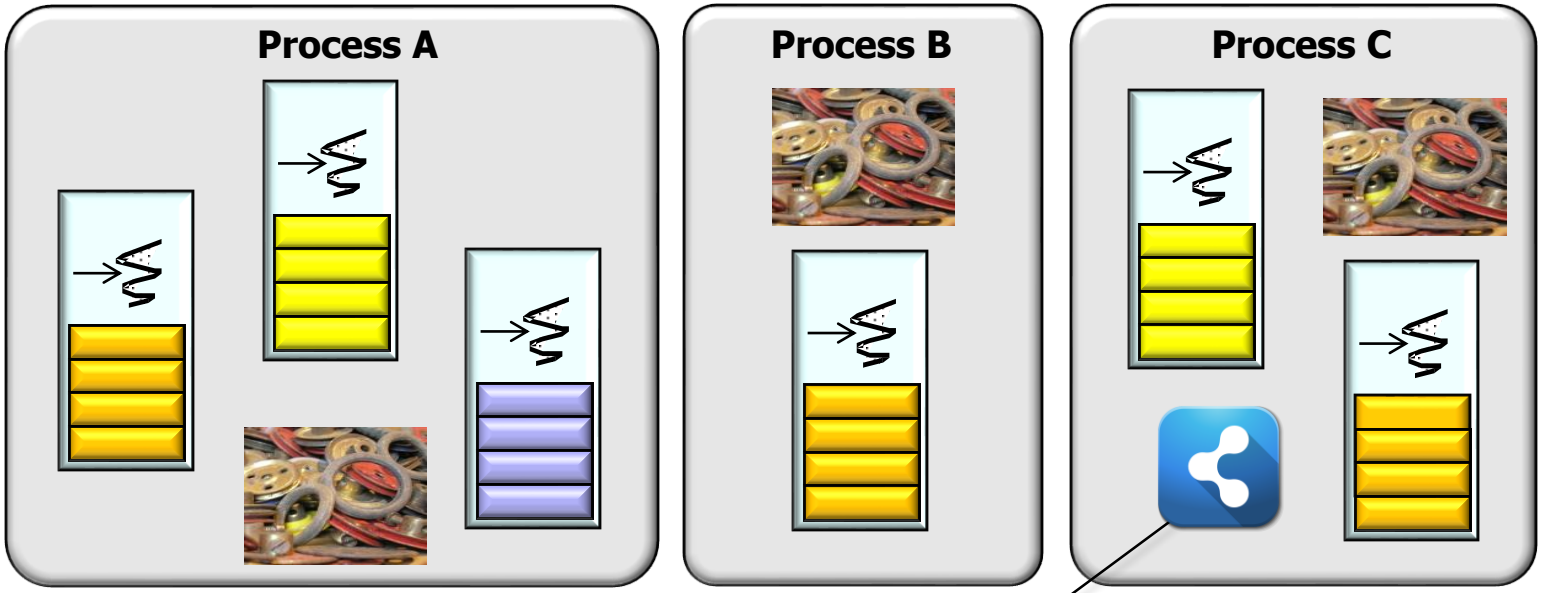


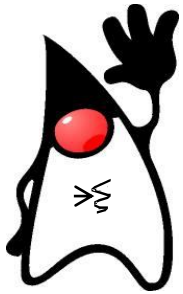
Each Java thread leverages unique "state" from the underlying operating system thread, e.g., a runtime stack, an instruction counter, & other registers

See en.wikipedia.org/wiki/Thread_(computing)#Processes.2C_kernel_threads.2C_user_threads.2C_and_fibers

Introduction to Java Threads

- Threads are the most basic way of obtaining concurrency in Java





Java dynamic & static objects can be shared across Java threads (i.e., this "state" is common)

See en.wikipedia.org/wiki/Thread_(computing)#Processes.2C_kernel_threads.2C_user_threads.2C_and_fibers

End of Java Thread: Introduction to Threads