MemorySegments

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1 Memory segments

https://www.geeksforgeeks.org/memory-layout-of-c-program/

1.1 Table of Contents

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1.2 Memory segments in C/C++ programs

- main memory (RAM) is typically divided into 2 main spaces:
  1. kernel space - reserved for running the kernel (OS background processes, device drivers, etc.)
     - loaded in lower addresses
  2. user space - user-mode applications are loaded
     - loaded in higher addresses
- in C/C++ programs, user space is divided into 5 different areas, called segments:

1.2.1 Stack segment

- also called scratch pad
- function parameters, local variables, and other function-related register variables are stored
- grows and shrinks based on program needs

1.2.2 Heap segment

- dynamically allocated variables (using pointers) are allocated from this segment
- Heap size is normally much larger compared to stack size
- size (actual) grows and shrinks based on program needs

1.2.3 BSS segment (Block Started by Symbol)

- also called the uninitialized data segment)
- zero-initialized or uninitialized global and static variables are stored

1.2.4 Data segment

- also called the initialized data segment
- initialized global and static variables are stored

1.2.5 Text segment (also called a code segment)

- compiled program/code is loaded
- code segment is typically read-only.

Programmers primarily focus on the heap and the stack, as that is where most of the interesting stuff takes place.

1.3 Demo program

memory_segments.cpp - compile and run memory_segments.cpp inside demo-programs folder to see various memory segements in use by a C++ program

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