C as Implemented in Assembly

Overview

- For real-time DSP applications we use C for rapid prototyping and code maintainability
- There are no MCUs which execute C, only machine code
- So we compile the C to assembly code, a human-readable representation of machine code
- We need to know what the assembly code implementing the C looks like
  - To use the processor efficiently
  - To analyze the code with precision
  - To find performance and other problems
- An overview of what C gets compiled to
  - C start-up module, subroutines calls, stacks, data classes and layout, pointers, control flow, etc.
The Convenience of C and C++

- As many functions and variables as you want!
- All the memory you could ask for!
- So many data types!
  - Many integer types
  - Floating point
- So many data structures!
  - Arrays, lists, trees, sets, dictionaries
  - Custom types
- So many control structures!
  - Various looping means,
  - if/then/else, etc.
- Iterators!
- Object oriented, e.g., Polymorphism!