EMBEDDED OPERATING SYSTEMS

Embedded Linux on Beaglebone Black

What is Variadic?

- In math and computing
  - **Variadic** refers to functions with indefinite arity
    - Once that accepts a variable number of arguments

- C supports variadic functions

  #include <stdarg.h>
  - Supports portable implementation of variadic across platforms

- C uses ellipsis (…)
  - To indicate that a function is variadic in nature

C support for variadic

- A datatype ***va_list***
- 4 macros
  - *va_start*
    - Inputs: ***va_list*** object, function's last parameter (before …)
    - Initializes the ***va_list*** for use by ***va_arg*** and ***va_copy***
  - *va_arg*
    - Inputs: ***va_list*** object, datatype descriptor
    - Expands to the next variable argument
  - *va_end*
    - Input: ***va_list*** object
    - Cleans up
  - *va_copy*
    - Inputs: 2 ***va_list*** objects
    - Clones the first into the second

Variadic usage types

- Pass in the expected number of arguments
  - As an input argument
    - Example prototype / definition:

      void my_func(int x, float y, int count, …)
      - Here, count indicates the number of arguments
      - Expected as part of the …

- Pass in a sentinel value at the end
  - Generally, NULL
    - Example invocation:

      this_func(int x, float y, double z, char w, NULL);
      - Here, NULL acts as the indicator for the end of argument list
      - Has to be handled by the function code

Variadic exercise

- ***variadic-1.c***
  - Study the usage of variadic objects and macros in C
  - Extend it to using sentinels

THANK YOU!