

Introduction to C Programming

- History
- Features
- How do I use C ?
- Programming style
- C data types
 - Basic data types
- Literals
- Storage class
- Scalar variable definitions



History

- 1972 : Dennis Ritchie
 - developed as a convenient way of accessing the machine instruction set
 - produced efficient machine code
- 1973 : Ritchie and Ken Thompson
 - rewrite the UNIX kernel using C
 - portability was a requirement
- 1977 : Ritchie and Brian Kernighan
 - “The C Programming Language”
 - K&R dialect of C
- AT&T releases PCC : Portable C Compiler
 - *de facto* “standard” starts to break down as vendors begin to “extend” their C compilers in non-portable ways



History (2)

- 1983 : James Brodie (Motorola) applies to X3 committee of ANSI to draft a C standard
 - ANSI (American National Standards Institute)
 - results in X3J11 – C Programming Language Committee
- 1985 : AT&T (Bjarne Stroustrup) and first release of C++
 - (But that's another story)
- 1987, 1989
 - ANSI Standard C defined simultaneously with ISO
 - ISO (International Standards Organization)
 - Committee JTC1 SC22 WG14
- we will be focusing on a version referred to as ANSI C
 - GNU toolchain



```
/*
 * mywc.c: not-quite-so-robust version of "wordcount"
 */

#include <ctype.h>
#include <stdio.h>
#include <string.h>
#include <stdlib.h>

#define MAX_LINE_LEN 256

int main (int argc, char **argv) {
    FILE *infile;
    char line[MAX_LINE_LEN];

    int  num_chars = 0;
    int  num_lines = 0;
    int  num_words = 0;

    char *c;

    if (argc < 2) {
        fprintf(stderr, "usage: %s filename\n", argv[0]);
        exit(1);
    }

    infile = fopen(argv[1], "r");
    if (infile == NULL) {
        fprintf(stderr, "%s: cannot open %s", argv[0], argv[1]);
        exit(1);
    }

    /* continued on next slide with same indentation */
}
```

```
/* continued from previous slide */

while (fgets(line, MAX_LINE_LEN-1, infile) != NULL) {
    num_lines += 1;
    num_chars += strlen(line);
    if (strncmp(line, "", MAX_LINE_LEN) != 0) {
        num_words++;
    }
    for ( c = line; *c; c++) {
        if (isspace(*c)) {
            num_words++;
        }
    }
}

fclose(infile);

printf ("%s: %d %d %d\n", argv[1],
        num_lines, num_words, num_chars);

return 0; /* return the success code */

}
```