

# C Command Line Arguments

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## Command Line Arguments

- Functions have arguments
- Caller specify arguments when calling the function
- main() function also have arguments
- Who specifies arguments for main()?
- Examples:
  - Most UNIX tools take command line arguments
  - cp -r dir1 dir2

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## main()

```
int main(int argc, char *argv[]);
```

- argc: argument count
- argv: argument vector
  - Each element is a "char \*" pointing to a null-terminated char array (string)
  - argv[0] contains the name of the command
  - argv[i] contains the i<sup>th</sup> argument (0 < i < argc)
  - All command line arguments are represented as strings (e.g. "123")

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## Converting Arguments

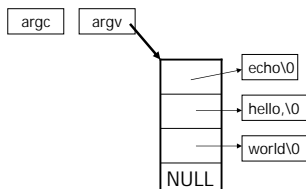
- int atoi(const char \*str);
- long int atol(const char \*str);
- int sscanf(const char \*str, const char \*format, ...);
- int getopt (int argc, char \* const argv[], const char \*optstring);

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## Example: echo

```
% echo hello, world
```

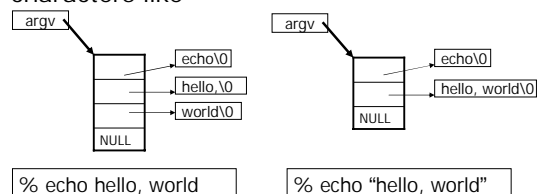


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## “ “ on the command line

- Group multiple words into one single argument
- Prevent the shell from interpreting special characters like “\*”



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## Process Options

- `strstr()`: find substring
- `strcmp()`: string compare
- etc.
  
- `getopt()`: more standardized option processing routine
- `getopt_long()`
- `getopt_long_only()`

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## getopt()

```
#include <unistd.h>
int getopt (int argc, char * const argv[], const char *optstring);
extern char *optarg;
extern int optind, opterr, optopt;
extern void getoptreset (void);
```

- `argc`: argument count
- `argv`: argument vector
- `sptstring`: accepted arguments spec
  - Option followed by ":" in the spec has option argument
- `optarg`: point to the option argument of the current option we are processing
- `opterr`: disable getopt error message
- `optopt`: value of the char that caused the error

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## getopt() (cont.)

- Successful: the next option character
- ":": a missing option argument; `optstring` begin with ":"
- "?": encounters an option character not in `optstring`; or a missing option argument, but `sptstring` does not begin with ":"
- -1: otherwise
  - We can use this to handle non-option command line arguments

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- John H. Hartman, *Classnotes for Csc352-Spring03*, CS Dept., University of Arizona, 2003
- Brian W. Kernighan, Dennis M. Ritchie, *The C Programming Language (2<sup>nd</sup> Ed.)*, Prentice Hall, 1988

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