

Makefile cheatsheet

```
foo = "bar"
bar = $(foo) foo # dynamic (renewing) assignment
foo := "boo" # one time assignment, $(bar) now is "boo foo"
foo ?= /usr/local # safe assignment, $(foo) and $(bar) still the same
bar += world # append, "boo foo world"
foo != echo fooo # exec shell command and assign to foo
# $(bar) now is "fooo foo world"
```

= expressions are only evaluated when they're being used.

Magic variables

```
out.o: src.c src.h
  $@ # "out.o" (target)
  $< # "src.c" (first prerequisite)
  $^ # "src.c src.h" (all prerequisites)

%.o: %.c
  $* # the 'stem' with which an implicit rule matches ("foo" in "foo.c")

also:
  $+ # prerequisites (all, with duplication)
  $? # prerequisites (new ones)
  $| # prerequisites (order-only?)

$(@D) # target directory
```

Command prefixes

-	Ignore errors
@	Don't print command
+	Run even if Make is in 'don't execute' mode

```
build:
  @echo "compiling"
  -gcc $< $@

-include .depend
```

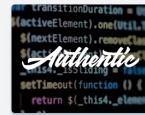
Find files

```
js_files := $(wildcard test/*.js)
all_files := $(shell find images -name "**")
```

Substitutions

```
file      = $(SOURCE:.cpp=.o) # foo.cpp => foo.o
outputs   = $(files:src/%.coffee=lib/%.js)

outputs   = $(patsubst %.c, %.o, $(wildcard *.c))
assets    = $(patsubst images/%, assets/%, $(wildcard images/*))
```



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More functions

```
$(strip ${string_var})

$(filter %.less, $(files))
$(filter-out %.less, $(files))
```

Building files

```
%o: %.c
    ffmpeg -i $< > $@ # Input and output
    foo $^
```

Includes

```
-include foo.make
```

Options

```
make
-e, --environment-overrides
-B, --always-make
-s, --silent
-j, --jobs=N # parallel processing
```

Conditionals

```
foo: $(objects)
ifeq ($(CC),gcc)
    $(CC) -o foo $(objects) $(libs_for_gcc)
else
    $(CC) -o foo $(objects) $(normal_libs)
endif
```

Recursive

```
deploy:
    $(MAKE) deploy2
```

Further reading

- [isaacs's Makefile](#)
- [Your Makefiles are wrong](#)
- [Manual](#)





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