CS530
HW1
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http://merlot.usc.edu/cs530-s10
Programming & Good Habbits

Always check return code!
- open(), write()
- malloc()
- switch (errno) { ... }

Initialize all variables!
- int i=0;
- struct timeval timeout;
  memset(&timeout, 0, sizeof(struct timeval));

Never leak any resources!
- malloc() and free()
- open() and close()
- Delete temporary files
Programming & Good Habbits (Cont...)

Don’t assume external input will be short
- use strncpy() and not strcpy()
- use snprintf() and not sprintf()
- use sizeof() and not a constant, for example,

```c
unsigned char buf[80];

buf[0] = '\0'; /* initialization */
strncpy(buf, sizeof(buf), *argv[1]);
buf[sizeof(buf)-1] = '\0'; /* in case *argv[1] is long */
```

Fix your code so that you have zero compiler warnings!
Notes on `gdb`

The debugger is your friend! Get to know it!

- **compile program with**: `-g`
- **start debugging**: `gdb hw1`
- **set breakpoint**: `(gdb) break foo.c:123`
- **run program**: `(gdb) run`
- **clear breakpoint**: `(gdb) clear`
- **stack trace**: `(gdb) where`
- **print field**: `(gdb) print f.BlockType`
- **printf()**: `(gdb) printf "%02x\n", buf[0]`
- **single-step at same level**: `(gdb) next`
- **single-step into a function**: `(gdb) step`
- **print field after every cmd**: `(gdb) display f.BlockType`
- **assignment**: `(gdb) set f.BlockType=0`
- **continue**: `(gdb) cont`
- **quit**: `(gdb) quit`

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Numbers

'Z' is 0x5a (hex)
- integer: 90
- hex: 0x5a
- binary: 0101 1010
- octal: 0132
- hexstring representation: "5a"

Memory
- char buf[40]
- hexstring: e7c16723f8e70c751ddd01c51d7c27d
  - buf[0] = 0xe7
  - buf[1] = 0xc1
  - buf[2] = 0x67
  - ...
  - buf[15] = 0x7d
Yesterday, all my troubles seemed so far away. Now it looks as though they're here to stay. Oh, I believe in yesterday... Suddenly, I'm not half the man I used to be. There's a shadow hanging over me... Oh, yesterday. Came suddenly... Why she had to go, I don't know. She wouldn't say... I said something wrong, now I long for yesterday... Yesterday, love was such an easy game to play. Now I need a place to hide away. Oh, I believe in yesterday...---by John Lennon and Paul McCartney.
Hexdump (Cont...)

Binary file:

000000:  47 49 46 38 39 61 4b 00  6e 00 84 00 00 bf 60 60  GIF89aK.n.
000010:  f9 ef ef 9f 10 10 b9 50  50 99 00 00 db a5 a5 f2  ~~~~ PP~
000020:  df df b3 40 40 d2 8f 8f  ec cf cf cc 7f 7f ff ba  ~~~@~
000030:  10 c6 70 70 ac 30 30 a6  20 20 ff ff ff e5 bf bf .~pp~00~
000040:  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00 00
000050:  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00 00
000060:  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00 00
000070:  01 00 00 0f 00 2c 00 00  00 00 4b 00 6e 00 00 05 ......!

You must match the above format exactly