

# TESTING PRACTICES

# Testing Models

- Whitebox testing
  - Testing guided by the internals of the system
  - Usually have access to the source code
- Black box testing
  - No knowledge of the internals of the system
  - Have to use intuition about how the system might be designed and where possible edge/corner cases are

# Whitebox Testing

- Statement coverage
  - Testing such that every line of a program is executed
- Branch testing
  - Testing **every** branch of a program
- Path testing
  - Testing every possible *path* through a program

# How is Statement testing different from Branch testing?

```
int main(int argc, char *argv[]) {  
    int i = -1;  
    if (argc != 15)  
        i = 0;  
    return i;  
}
```

# A case for path testing

```
void foo(char *buf, int n, int should_free) {  
    if (should_free) free(buf);  
    if (n > 10)  
        printf("%s\n", buf);  
}
```

# What should we test?

- `./readnames filename`
  - Reads names (“Firstname Lastname”) from a file
  - 1 name per line

# Break it down

- Test command line arguments
  - Too few arguments
  - Too many arguments
  - Wrong *type* of arguments
    - filename does not exist
    - filename is not a file (directory)
    - filename is not a readable file

# Testing the file

- Test an empty file (0 byte file)
- Test a file with only a single line
- Test incomplete lines
- Test lines with more than 2 terms
- Lines with extra whitespace (trailing / leading/  
in between)
- EOF partway through the file