

Communicating in Code: Naming

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- An effective way to express ideas of what you want the computer to do
- Communication!
 - To the computer
 - To yourself (later on)
 - To others

What about Documentation?

- External documentation is very useful, but has its own problems
 - Can be out of date/inconsistent with program
 - Maintained separately (multiple files)
 - Often for a different audience
 - developer vs. user
- Clearly written code can be more important than well-written documentation of that code

Communicating in Code

- Choosing good names
- Including appropriate comments
- Following good layout and style

- These are all critical to documentation, and with good naming, commenting, and layout, other documentation may be unnecessary!

Names

- We assign names **throughout** a program
- Give identity
- Imply behavior/purpose
- Provide recognition

What gets named?

- Variables
- Functions
- Types/classes
- Namespaces
- Macros
- Source Files

Choosing Names

- Sometimes there are naming conventions
 - If you work at a company that has an agreed convention, follow it!
- But, there are several “wise” ideas to consider when choosing names.

Naming Considerations

Be sure it's not a reserved name (Duh!)
Sometimes it's easy to forget...

Make it **informative**

Keep it **concise**

Make it **memorable**

Make it **pronounceable**

Informative Names

- The amount of information a name needs depends on its scope – understand it when seen
- Use descriptive names for globals, short names for locals
- Large routines/loops need more descriptive names

```
s = 0;
for (WhichGroup=0; WhichGroup<num; WhichGroup++)
{
    s += G[WhichGroup].n();
}
```

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```
nAnimals = 0;
for (i=0; i<NumAnimalGroups; i++) {
    nAnimals += AnimalGroup[i].NumberInGroup();
}
```

Descriptive Names

- Names should convey what it represents or does, unless obvious from context
- Describe everything a routine does
 - Print() vs. **PrintAndCloseFile()**
- Avoid meaningless or vague names
 - HandleData(), PerformAction(), etc.

Descriptive Names

- Procedures: Active names
 - Verb followed by noun
 - AnotherStudent(s) vs. **AddStudent(s)**
- Functions different: give return value
 - GetNumStudents() vs. **numStudents()**
- Booleans: Be clear what is returned
 - checkEOF vs. **isEOF**

Consistent Names

- Key: **Be Consistent!**
 - nKids, numKids, num_kids, NumKids, nkids, Number_Kids, numberofkids
 - Write1stObject(), WriteSecondObject(), write_third_object()
 - averageSalary vs. salaryMinimum
- Use related names for related operations
 - OpenFile(): CloseFile() vs. fclose()
 - open/close, first/last, old/new, min/max, etc.

Name Length

- Tradeoff between description and visual space
- Moderate-length names tend to be best
 - 8-20 characters
- If a glance at the code seems like it has lots of short or lots of long names, use caution!
- Scope plays a role
- Rarely-used functions might be longer

Other Random Naming Considerations

- Beware of “temp” variables
- Be careful of reusing variable names
- Be careful of overloading names
- Avoid intentional misspellings
- Consider pronunciation

Conventions

- Lots of conventions out there
- Conventions help convey information away from its definition
- Very useful for larger groups/programs
- Examples:
 - Globals have initial capital letters
 - Constants are in ALL CAPS
 - Etc.

Common Naming Conventions

- Beginning/ending with a p if a pointer
- Starting with n for a number
- i, j are integer indices
- s is a string, c or ch are characters

Example: Hungarian Naming Convention

- Base types:
 - wn Window
 - scr Screen Region
 - fon Font
 - ch Character
 - pa Paragraph
- Eg: wnMain, scrUserWorkspace

Example: Hungarian Naming Convention

- Prefixes
 - a array
 - c count
 - d difference between two variables
 - e element of array
 - g global variable
 - h handle
 - i index into array
- e.g. `iwnUserView` = index into array of windows giving user views