CS 302: Computer Fluency

Paul Bae
pbae@utexas.edu

Who am I?

Senior in Computer Science at UT Austin

Born in Edmonds, Washington

Interests:

- Programming
- Startups
- Literature
- Coffee
- Sleep

Algorithms:

- Algorithms are instructions to do something
- For example, if we want to make a PB&J

1. Get bread(s)
2. Get Peanut Butter
3. Get Jelly
4. Put it together

Algorithms:

- You can write algorithms in any way
- For example, the make PB&J could be done with:
- “Make PB&J”
- Pretty easy right?
- So why don’t we?

What are algorithms for?

The computer:

```
0000000 0000 0001 0001 1010 0010 0001 0004 0128
0000010 0000 0016 0000 0028 0000 0010 0000 0020
0000020 0000 0001 0004 0000 0000 0000 0000 0000
0000030 0000 0000 0000 0010 0000 0000 0000 0204
0000040 0004 8384 0084 c7c8 00c8 4748 0048 e8e9
0000050 00e9 6a69 0069 a8a9 00a9 2828 0028 fdfc
0000060 00fc 1819 0019 9898 0098 d9d8 00d8 5857
0000070 0057 7b7a 007a bab9 00b9 3a3c 003c 8888
0000080 8888 8888 8888 8888 288e be88 8888 8888
0000090 3b83 5788 8888 8888 7667 778e 8828 8888
00000a0 d61f 7abd 8818 8888 467c 585f 8814 8188
00000b0 8b06 e8f7 88aa 8388 8b3b 88f3 88bd e988
00000c0 8a18 880c e841 c988 b328 6871 688e 958b
00000d0 a948 5862 5884 7e81 3788 1ab4 5a84 3eec
00000e0 3d86 dcb8 5cbb 8888 8888 8888 8888 8888
00000f0 8888 8888 8888 8888 8888 8888 8888 0000
0000100 0000 0000 0000 0000 0000 0000 0000 0000
*
0000130 0000 0000 0000 0000 0000 0000 0000
000013e
```

How does the computer run algorithms?

Program, or code
Programs are written in programming languages
They often look a little like this:

```
void QNote::setup()
{
    readConfig();
    QStringList files = parentDir.entryList(QDir::AllEntries | QDir::NoDotAndDotDot);
    fileModel = new FileViewModel(files, 0);
    ui->listView->setModel(fileModel);
}

void QNote::readConfig()
{
    QFile configFile(QDir::homePath() + QDir::separator() + ".notetakinginfo");
    if (!configFile.exists()) {
        QMessageBox::warning(this, tr("No default directory found"), tr("Please choose a default directory"));

        QString working_dir_name = QFileDialog::getExistingDirectory(this, tr("Default directory"),
                                                                     QDir::homePath(),
                                                                     QFileDialog::ShowDirsOnly
                                                                     | QFileDialog::DontResolveSymlinks);
        if (!working_dir_name.isEmpty())
            parentDir = QDir(working_dir_name);
        else
            readConfig();
```

Syntax

Syntax means the “grammar” rules of the code

It can include:

- Indentation
- Keywords
- Spelling
- And much, much more

So why does this matter?

As we just learned, the computer can only run certain types of code

We want our programs to conform to those types

Getting in the habit of writing clear pseudocode will make your life as a programmer much easier

Pseudocode

Pseudocode is a simple version of code:

- It doesn't have any rigid syntax
- But it should be expressive and clear

Example

1. Sum numbers up in a list

Versus

1. Set sum to 0
2. While there are more numbers in the list:
3. sum += N_i
4. print sum

Practice

Introduce yourself to the person on your right
And start working together on the next example

Data structure for the Best Sellers list on the New York Times

Rank	Name	Price	Weeks on the list
1	The Glass Castle	$16.00	29
2	Unbroken	$27.00	84
3	Wild	$25.95	20
...	etc.	etc.	etc.
15	The Power of Habit	$28.00	20

Exercise 1

Find the books that have been on the list for more than 50 weeks (print them out)

Exercise 2

Count the number of the books whose price is higher than $30

Exercise 3

Find the name of the book which has been on the list for the longest time

Announcements

- Homework 1 is due today 5PM
- Homework 2 will be released next week
- Join MAD! (Mobile App Devs)
- CNS Career Fair EXPO the 18th

Contact

- My office hours are from 1-3PM in GDC 1.302
- Email: pbae@utexas.edu
- Slides: https://github.com/pybae/slides