

## Lecture: 2-1

- Prerequisites for this lecture are: 1-1 and .

## John Romero Programming Proverbs

- 2. “It’s incredibly important that your game can always be run by your team. Bulletproof your engine by providing defaults (for input data) upon load failure.”
- John Romero, “The Early Days of Id Software - John Romero @ WeAreDevelopers Conference 2017”

# Python

- Python is a scripting language

# Python Gotha's

- blocks are defined by indentation!
- turn off tabs in your favourite editor
- in your own programs examples never create a name clash with a Python library module
- Python2 vs Python3
  - we will be using Python3

## Python verses similar tools

- Python is a scripting language
  - it can be compiled if necessary to increase speed
- is more powerful than many other scripting languages, Tcl
  - applicable to larger systems development (games, net admin)
- has a much cleaner syntax than Perl
  - easier to maintain
- does not compete head on with Java
  - Java is a systems language like C++

## Python and games

- examples of games which use Python `<http://wiki.python.org/moin/PythonGames>`

# Python can be simple



```
#!/usr/bin/python3  
print("hello world")
```

# Python Modules allow for problem decomposition

- similar to Modula-2

- myfile.py

```
#!/usr/bin/python3  
  
title = "hello world"
```

- foo.py

```
#!/usr/bin/python3  
  
import myfile  
print(myfile.title)
```

- when run prints hello world



## Alternative import



**bar.py**

```
#!/usr/bin/python3  
  
from myfile import title  
print(title)
```

- note that all python modules need to be saved as *name.py*
  - so in our example the module `myfile` was saved into a file called `myfile.py`

# Python builtin types

- python contains many builtin types
  - use them..
- builtin objects make simple programs easy to understand
  - lists, dictionaries, exist, don't reinvent the wheel
- built in objects are more efficient than custom data types

## Builtin objects



|              |                                      |
|--------------|--------------------------------------|
| numbers      | 3.14159, 1234                        |
| strings      | 'spam', "fred's"                     |
| lists        | [1, [2, 'three'], 4]                 |
| dictionaries | { 'food': 'spam', 'taste': 'yum' }   |
| tuples       | (1, 'spam', 4, 'U')                  |
| files        | text=open('/etc/passwd', 'r').read() |

# Expression operators



|                          |                                   |
|--------------------------|-----------------------------------|
| or, and, not             | logical operators (short circuit) |
| <, <=, >, >=, ==, <>, != | comparison operators              |
| x   y                    | bitwise or                        |
| z & y                    | bitwise and                       |
| x << y                   | shift left by y bits              |
| x >> y                   | shift right by y bits             |
| x[i]                     | indexing                          |
| x[i:y]                   | slicing                           |
| x.y                      | qualifying (imports)              |
| x(y)                     | function calls                    |

# Strings

- concatenation via +
  - repeated via \*
-