programming language classification

imperative:

- van Wijnen: C, Python, VB

- scripting: csh, perl, ...

- specify how the computer carries out tasks

object oriented:

- Java, C++, ...

declarative:

- programming by definitions

functional:

- Lisp, Schemer, ML, Haskell

- defining functions

logic:

- Prolog

- define facts

Ex: Salem is a cat

cat(Salem)

- eats mice

- eat.mice(x) = cat(x)

- what eats mice?

- eat.mice(x) = x = Salem
What is a compiler?

convert source into machine code something else

interpreter: takes source code or intermediate code (like Java class files)

and executes that

```
Source
  \rightarrow \text{compile}

\rightarrow \text{target}
\rightarrow \text{output}
```

```
Source
\rightarrow \text{input}
\rightarrow \text{interpret}
\rightarrow \text{output}
```

(Old BASIC)

```
Input \rightarrow \text{target} \rightarrow \text{output}
```

pre compiled
Java source
compiler
intermediate code
interpreter
output

Compiler: compiled source code translator

Phases of compilation

- Scanner: breaks source into tokens
- Syntax: form
- Parser: build parse tree
- Semantics: meaning

```
x + y

; ; ;
```