Language group

 \blacksquare Imperative

(Fartian, Colbol, C) (Java, Ctt, Ct) (Python, JavaScript) •von Neumann object-oriented scripting languages

Declarative

(Huskell) functional

•logic, constraint-based (Prolog)

In this class

·Languages we will cover

Java

C++

Python Java Script

Haskell

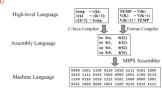
Sorry, but don't expect me to guide you be a programming expert, please.

Imperative languages

- •Imperative languages predominate
- •They will occupy the bulk of our attention
- •We also plan to spend a lot of time on functional language

How does the computer understand program?

or maching code.



Compilation vs. Interpretation

Compilation

•The compiler translates the source program into an equivalent <u>target</u> program



Interpretation

•Interpreter stays around for the execution of the program Source program

Interpreter

Compilation vs. Interpretation

•Most language implementations include a mixture of both compilation and interpretation

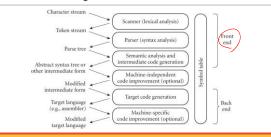


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Compilation

- •Compilation (does / does not) have to produce machine language
- •Compilation is translation from one language into another, with full analysis of the meaning of the input

Phase of Compilation



9.13

What makes a program valid?

- •Does it LOOK like a valid program?
- Syntax
- •Does it MEAN for a valid program?
- Semantic
- •Is it the correct one for the job?
- Correctness

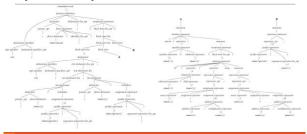
Lexical Analysis

int main() {
 int i = getint(), j = getint();
 while (i != j) {
 if (i > j) i = i - j;
 else j = j - i;
 }
 putint(i);
}

int	main	()	{								
int	i	=	getint	()	,	j	=	getint	()	;
while	(i	!=	j)	{						
if	(i	>	j)	i	=	i	-	j	;	
else	j	=	j	-	i	;						
}												
putint	(i)	;								
}												

9.10

Syntax Analysis



Semantic Analysis

- •Semantics is concerned with what the parse tree means.
- •What properties do we want from language semantics definitions?
- Precise
- ulletComplete