COMP 110/L Lecture 2

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Programming Languages
as
Natural Languages

Syntax

Syntax

Defines what valid sentences are

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Megan goes to the store.

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Megan goes to the store. ✅

–This is a valid sentence according to the syntactic rules of English

Syntax

Defines what valid sentences are

Megan goes to the store. ✓

The goes store to Megan.

Syntax

Defines what valid sentences are

Megan goes to the store. ✓

The goes store to Megan.

–This is not a syntactically valid sentence according to the rules of English
–Programming languages have the exact same sort of rules, though the valid sentences usually don't _look_ like natural language sentences.
–The methods for defining programming language syntax were taken directly from linguistics; the idea of a syntax error predates computers

Semantics

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Defines what valid sentences *mean*

Semantics

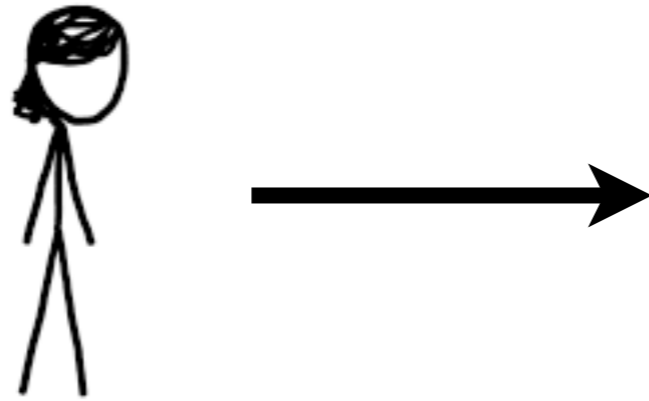Defines what valid sentences *mean*

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Defines what valid sentences *mean*

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???

–Natural languages allow us to define sentences that are syntactically valid but semantically nonsensical

Programming Language Semantics

- Some languages have the same problem!

- All syntactically valid sentences in Java have prescribed meaning

    - ...this meaning might not be useful...

    - ...and it definitely could be unintended...

–C/C++ lets you define equally meaningless statements (thanks to undefined behavior)

Learning a Language

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Have to start somewhere

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Need nouns
(that which can act
or can be acted on)

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Need verbs
(the actions)

Learning a Language

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Megan goes to the store.

Need nouns
(that which can act
or can be acted on)

Need verbs
(the actions)

Need connections between the two

–This will work

The Point

- To make complete sentences, we need a lot of stuff

- Java requires a *lot* for a complete sentence

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- To make complete sentences, we need a lot of stuff

- Java requires a *lot* for a complete sentence

```
public class MyClass {
   public static void
   main(String[] args) {
      ...
   }
}
```

–For now, the ... is everything you actually want to write, everything else is required but somewhat indirect

The Point

- To make complete sentences, we need a lot of stuff

- Java requires a *lot* for a complete sentence

```
public class MyClass {
    public static void
    main(String[] args) {
        ...
    }
}
```

For now, a magical incantation

–For now, the ... is everything you actually want to write, everything else is required but somewhat indirect

Let's see some code!
(in jGrasp)