**Chapter 06 Activities**

Activity 06a Looking at ambiguous phrases

In section 6.4, students learn about parsing and parse trees. This idea is also used to make meaning of sentences in the English language, and one branch of Artificial Intelligence deals with making meaning of sentences using this method. At times it can be confusing to parse an English sentence, and this activity helps students see how parse trees work while introducing some of the challenges that Artificial Intelligence programs must handle.

Activity 06b Working with objects

This activity helps students understand the object-oriented paradigm. In particular, students consider the difference between a class, an object, the state of an object, and methods that can be performed on an object.

**Activity 06a Parsing Ambiguous Sentences**

A. Just as computer scientists try to parse statements in any given programming language, researchers try to write algorithms that parse human language. This is part of the branch of computer science called Natural Language Processing.

(sources: <https://www.nytimes.com/2010/01/31/magazine/31FOB-onlanguage-t.html> and

<https://www.youtube.com/watch?v=CXpZnZM63Gg&list=PL8FFE3F391203C98C>)

Here is a headline taken from an actual news article: “Teacher Strikes Idle Kids”

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| What is the verb in this sentence? |
| What is the noun? |
| What are the other parts of the sentence ? |

B. Explain the two different meanings of each headline.

Hospitals are Sued by Seven Foot Doctors Hospitals are Sued by Seven Foot Doctors

Local High School Dropouts Cut in Half Local High School Dropouts Cut in Half

British Left Waffles on Falklands British Left Waffles on Falklands

Gator Attacks Puzzle Experts Gator Attacks Puzzle Experts

C. Now that we have had some fun with the English Language, let’s go back to the parsing of computer statements. Imagine that you have made up a computer language that does not have clear grammar rules. What would be some computer programming statements that might be ambiguous?

**Activity 06b Working with Objects**

A. Many programming languages are designed to work with objects. An object is a particular instance of a class (its template). Every object’s current state can be defined by naming instance variables, and its state can be changed by defining methods.

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| Example: List the current state of your phone at this moment: |

B. Imagine that you have a smartwatch that can accept voice commands to act on certain objects in your home. Assume there two classes of objects that can interact with your smart watch in you home. They are Room and Television. (Assume that you live in a house with “smart” rooms.)

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| --- | --- |
| Assign names to two or more rooms in your home. |  |
| Assign names to two or more televisions in your home. |  |

C. State. What is the current state of a Television? What kinds of things can you change in a television?

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| List at least 3 things. |

What is the current state of a Room? Assume it is enabled with smart technology .

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| List at least 2 things. |

D. Now, imagine you and someone else are home. One person goes into one room and sets the TV in that room. The other person goes into a different room and sets the TV in that room. List the commands that each person might speak into your smart watch.

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| --- | --- | --- |
| Name of object | Command | Any inputs (up, down, on, a number…..) |
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E. One day, the TV stops working, and you decide to get a new one. How would you tell your smartwatch that you have a new TV? What information would you need to provide to your smartwatch?

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