

Pooh's Encyclopedias (2007)

Rating: fun

Think about how search engines work while helping Whinnie the Pooh and his friends solve their problems.

Problem:

<http://www.naclo.cs.cmu.edu/assets/problems/prob07.pdf>

Solution:

<http://www.naclo.cs.cmu.edu/assets/problems/soln07.doc>

The Lost Tram (2007)

Rating: fun

**See how optical character recognition
can go wrong!**

Problem:

<http://www.naclo.cs.cmu.edu/assets/problems/prob07.pdf>

Solution:

<http://www.naclo.cs.cmu.edu/assets/problems/soln07.doc>

Springing up Baby (2008, open)

Rating: Will work for fun

Don't know Hindi? No problem! Learn how machine translation works by decoding the mystery words in this problem.

Problem:

<http://www.naclo.cs.cmu.edu/assets/problems/naclo08r1.pdf>

Solution:

http://www.naclo.cs.cmu.edu/assets/problems/naclo08r1_sol.pdf

Fakepapersshelfmaker (2008, invitational)

Rating: Challenge

See how a data structure called a tree can help you understand Japanese.

Problem:

<http://www.naclo.cs.cmu.edu/assets/problems/naclo08r2.pdf>

Solution:

http://www.naclo.cs.cmu.edu/assets/problems/naclo08r2_sol.pdf

Thorny Stems (2008, invitational)

Rating: Challenge

Stemmers chop suffixes off of words so that search engines can see that they have the same root (e.g., walk, walking, walked, walks). Can you make this stemmer work?

Problem:

<http://www.naclo.cs.cmu.edu/assets/problems/naclo08r2.pdf>

Solution:

http://www.naclo.cs.cmu.edu/assets/problems/naclo08r2_sol.pdf

aw-TOM-uh-tuh (2008, invitational)

Rating: Challenge

Learn how an abstract machine called a finite state automaton can help you identify the words of this New Guinea language.

Problem:

<http://www.naclo.cs.cmu.edu/assets/problems/naclo08r2.pdf>

Solution:

http://www.naclo.cs.cmu.edu/assets/problems/naclo08r2_sol.pdf

The Whole Spectrum (2008, invitational)

Rating: Challenge

Learn the language of spectrograms.

Problem:

<http://www.naclo.cs.cmu.edu/assets/problems/naclo08r2.pdf>

Solution:

http://www.naclo.cs.cmu.edu/assets/problems/naclo08r2_sol.pdf

Nok-Nok! (2009, open)

Rating: Will work for fun

Christopher Robin needs help with spelling. Can you figure out his spelling checker works?

Problem:

http://www.naclo.cs.cmu.edu/assets/problems/naclo09prob_r1.pdf

Solution:

<http://www.naclo.cs.cmu.edu/assets/problems/naclo09sol.pdf>

Help my camera! (2009, open)

Rating: fun

**This chat bot is not making sense!
Can you figure out how to fix it?**

Problem:

[http://www.naclo.cs.cmu.edu/assets/problems/naclo09p
rob_r1.pdf](http://www.naclo.cs.cmu.edu/assets/problems/naclo09p
rob_r1.pdf)

Solution:

[http://www.naclo.cs.cmu.edu/assets/problems/naclo09s
ol.pdf](http://www.naclo.cs.cmu.edu/assets/problems/naclo09s
ol.pdf)

Sk8 Parsr (2009, invitational)

Rating: Challenge

In this fictional video game, the moves can be pretty complex. But how complex can they get before they break the program?

Learn about shift-reduce parsing. A technique that computers use for identifying structure in human languages and programming languages.

Problem:

http://www.naclo.cs.cmu.edu/assets/problems/naclo09prob_r2.pdf

Solution:

<http://www.naclo.cs.cmu.edu/assets/problems/naclo09sol.pdf>

Orwellspeak (2009, invitational)

Rating: Champion

In a dystopian future, a repressive government tries to prevent people from saying false sentences.

Learn about context-free grammars and markov models, computational techniques for describing sequences.

Problem:

http://www.naclo.cs.cmu.edu/assets/problems/naclo09prob_r2.pdf

Solution:

<http://www.naclo.cs.cmu.edu/assets/problems/naclo09sol.pdf>

Texting, Texting, One, Two, Three (2010 open)
Rating: Challenge

Learn about data compression while cracking a code.

- Problem:
- <http://www.naclo.cs.cmu.edu/problems2010/E.pdf>
- Solution:
- <http://www.naclo.cs.cmu.edu/problems2010/ES.pdf>

Dogs and Cats on Trees (2010, Invitational)

Rating: Challenge

Learn how computers parse sentences and learn Malayalam (a language from India) at the same time.

Problem:

<http://www.naclo.cs.cmu.edu/problems2010/I.pdf>

Solution:

<http://www.naclo.cs.cmu.edu/problems2010/IS.pdf>

F u c n r d t h s (2010, invitational)

Rating: Will work for fun

The overworked employees in a call center have developed a strange writing system with abbreviations. Can you decipher it?

But watch out, they make typos!

- Problem:
- <http://www.naclo.cs.cmu.edu/problems2010/K.pdf>
- Solution:
- <http://www.naclo.cs.cmu.edu/problems2010/KS.pdf>

Real Money (2010, invitational)

Rating: Challenge with math!

This is a basic math puzzle, except it's in Quechua (a language from South America).

Problem:

<http://www.naclo.cs.cmu.edu/problems2010/L.pdf>

Solution:

<http://www.naclo.cs.cmu.edu/problems2010/LS.pdf>

Khipu (2010, invitational)

Rating: Challenge with Math

- **Decipher an ancient Inca system of knots that was used for record keeping.**
- Problem:
- <http://www.naclo.cs.cmu.edu/problems2010/P.pdf>
- Solution:
- <http://www.naclo.cs.cmu.edu/problems2010/P.pdf>

Running on MT (2011, open)

Rating: fun

A machine translation program is making mistakes. Can you figure out why?

Problem:

<http://www.naclo.cs.cmu.edu/problems2011/A.pdf>

Solution:

<http://www.naclo.cs.cmu.edu/problems2011/AS.pdf>

Interstellar first contact (2012, open)

Rating: fun

Decoding messages in these fictitious alien languages will help you understand how computers translate one human language to another.

Problem:

<http://www.naclo.cs.cmu.edu/problems2012/NACLO2012ROUND1.pdf>

Solution:

<http://www.naclo.cs.cmu.edu/problems2012/NACLO2012ROUND1SOLUTIONS.pdf>

Waorani Numbers (2012, open)

Rating: fun with math!

This is a basic math puzzle, except it is in Waorani, a language from Ecuador.

Problem:

<http://www.naclo.cs.cmu.edu/problems2012/NACLO2012ROUND1.pdf>

Solution:

<http://www.naclo.cs.cmu.edu/problems2012/NACLO2012ROUND1SOLUTIONS.pdf>

The Little Engine that Could... Read (2012, invitational)
Rating: Challenge

**Professor Monotone has a machine that
can make inferences, but it is broken.
Can you fix it?**

Problem:

<http://www.naclo.cs.cmu.edu/problems2012/NACLO2012ROUND2.pdf>

Solution:

<http://www.naclo.cs.cmu.edu/problems2012/NACLO2012ROUND2SOLUTIONS.pdf>

Jeg kan tælle (2012, invitational)

Rating: fun with math

Figure out how to count in Danish.

Problem:

<http://www.naclo.cs.cmu.edu/problems2012/NACLO2012ROUND2.pdf>

Solution:

<http://www.naclo.cs.cmu.edu/problems2012/NACLO2012ROUND2SOLUTIONS.pdf>

One, Two, Tree (2012, invitational)

Rating: Champion, with math

**How many meanings are there for this phrase:
space mission control freak show? How could
you compute them?**

Problem:

<http://www.naclo.cs.cmu.edu/problems2012/NACLO2012ROUND2.pdf>

Solution:

<http://www.naclo.cs.cmu.edu/problems2012/NACLO2012ROUND2SOLUTIONS.pdf>

The Heads and Tails of Huffman (2013, open)

Rating: Challenge

- **Deb and her friend Ahab encode their messages in the binary language of heads and tails, but they don't have a lot of coins. How can they make their messages shorter?**
- **Learn about efficient encoding of information.**
- Problem:
- <http://www.naclo.cs.cmu.edu/pdf-split/N2013-C.pdf>
- Solution:
- <http://www.naclo.cs.cmu.edu/pdf-split/N2013-CS.pdf>

Grammar Rules (2013, open)

Rating: Challenge

- **Learn how a computer can analyze grammar with a notation called context-free rules.**
- Problem:
- <http://www.naclo.cs.cmu.edu/pdf-split/N2013-F.pdf>
- Solution:
- <http://www.naclo.cs.cmu.edu/pdf-split/N2013-FS.pdf>

Twodee (2013, open)

Rating: Champion, with math

- **This problem introduces a two dimensional notation for representing ambiguous sentences.**
- Problem:
- <http://www.naclo.cs.cmu.edu/pdf-split/N2013-H.pdf>
- Solution:
- <http://www.naclo.cs.cmu.edu/pdf-split/N2013-HS.pdf>

Yesbot (2013, invitational)

Rating: fun

Figure out how to make this slightly deranged chat bot smarter.

Problem:

<http://www.naclo.cs.cmu.edu/pdf-split/N2013-L.pdf>

Solution:

<http://www.naclo.cs.cmu.edu/pdf-split/N2013-LS.pdf>

A Tree by any other Name (2013, invitational)

Rating: Challenge

- **Learn about a computational technique called a decision tree while making a dictionary of English phrasal verbs (take out, call in, etc.)**
- Problem:
- <http://www.naclo.cs.cmu.edu/pdf-split/N2013-N.pdf>
- Solution:
- <http://www.naclo.cs.cmu.edu/pdf-split/N2013-NS.pdf>

Grice's Grifter Gadgets (2013, invitational)

Rating: Challenge

You have a flying robot that helps you cheat at card games, but how can you program it to give you the most relevant information?

Problem:

<http://www.naclo.cs.cmu.edu/pdf-split/N2013-Q.pdf>

Solution:

<http://www.naclo.cs.cmu.edu/pdf-split/N2013-QS.pdf>

