

School of Computer Science

<http://www.cs.adelaide.edu.au>



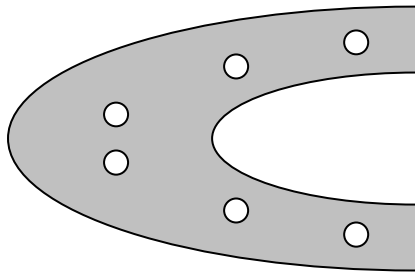
PUZZLE BASED LEARNING

Puzzles are a great way to develop the kind of problem solving skills that are needed for Computer Science and other engineering disciplines. In 2009, the School of Computer Science will introduce a first year course on puzzle based learning – but in the meantime, here are a few examples to test your wits on!

Solutions will be posted at www.cs.adelaide.edu.au on 31/8/2007.

Horseshoe

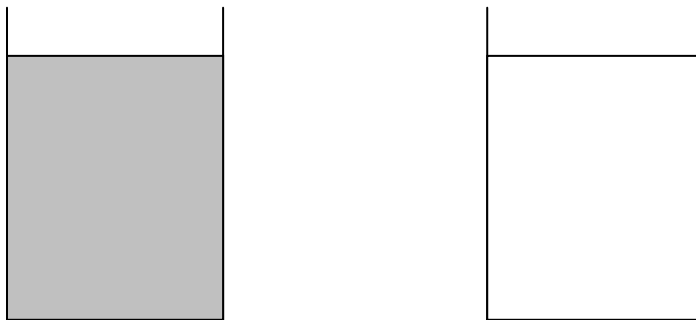
There is a horseshoe with six holes for nails, as shown below:



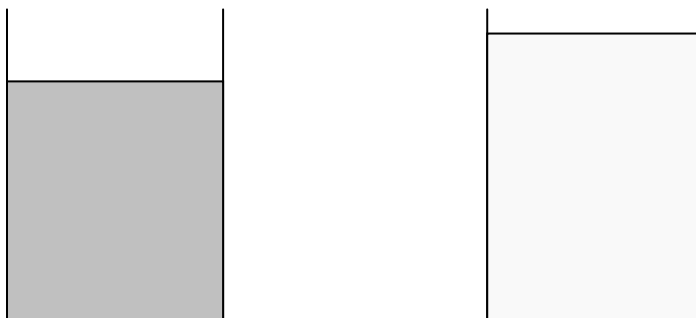
Using two straight-line cuts, chop it into six separate parts with a hole in each part.

Juice

In front of you is a glass of water and a glass of juice. Their volumes are identical:

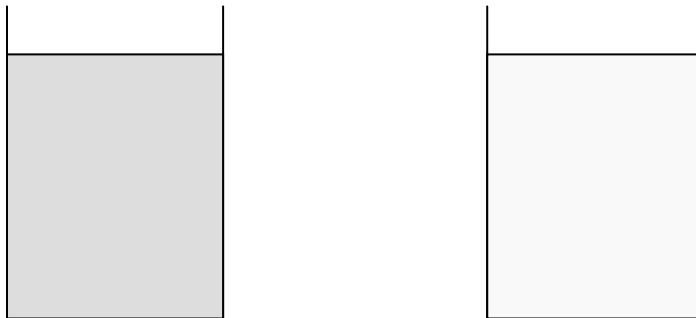


You take a full spoon of juice and put it in the glass of water:



SCHOOL OF COMPUTER SCIENCE
LEVEL 2, PLAZA BUILDING
THE UNIVERSITY OF ADELAIDE SA 5005
TELEPHONE +61 8 8303 5586
FACSIMILE +61 8 8303 4366
secretary@cs.adelaide.edu.au
<http://www.cs.adelaide.edu.au/>

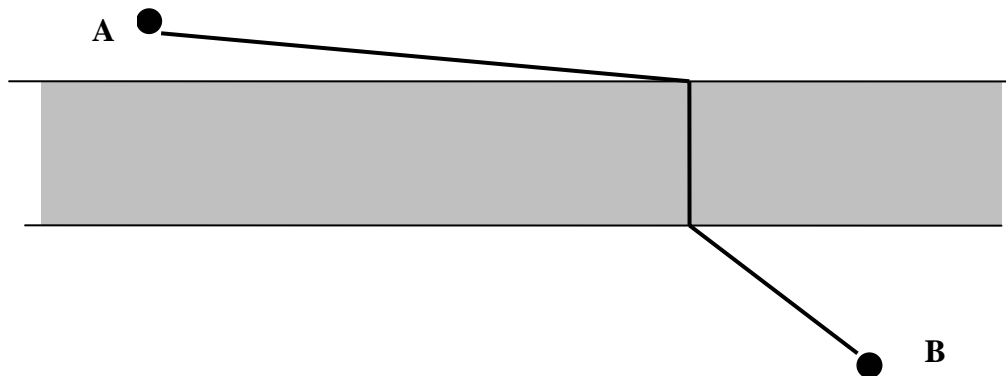
After briefly stirring up the mixture, you put a full spoon of the mixture back into the glass of juice:



Which is greater: the amount of juice in the water or the amount of water in the juice?

Building a bridge

Suppose we have to build a road from city A to city B, but these cities are separated by a river. We'd like to minimise the length of the road between these cities. The bridge must be constructed perpendicular to the banks of the river. Now, the question is: where to build the bridge so as to minimise the total length of the road?



Chocolate

A rectangular chocolate bar consists of $m \times n$ small rectangles and you wish to break it into its constituent parts. At each step, you may pick up one piece and break it along any of its marked vertical or horizontal lines. How can we break the chocolate bar into single pieces with the minimum number of steps?