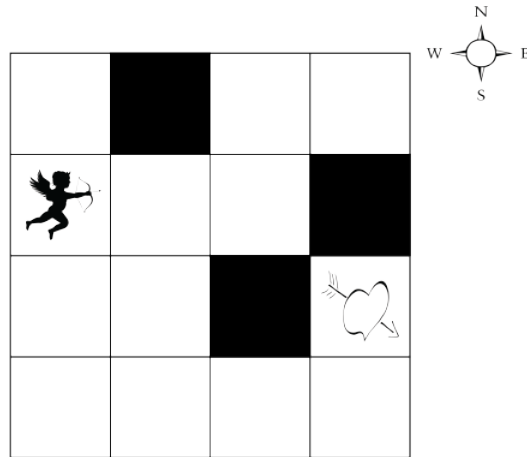# Problem of the Week
Problem B and Solution
Code to Guide Cupid

Problem

In the grid, the black squares represent obstacles to Cupid, who cannot go through them; nor can Cupid step outside the grid boundaries.

Let's play with some *pseudocode* to guide Cupid's path to the heart. The code will use the following instructions:

- fly1: moves Cupid one square in the current arrow direction

- rotc: turns (rotates) Cupid 90° clockwise

- rotcc: turns Cupid 90° counterclockwise

(a) For each set of pseudocode instructions, determine where Cupid ends up, or if an obstacle ends his quest (i.e., the code *crashes*).

(i)
```
fly1
rotc
fly1
fly1
rotc
fly1
```

(ii)
```
fly1
rotc
fly1
rotcc
fly1
```

(b) Write pseudocode which guides Cupid to the heart.

Solution

(a) (i) We go through the pseudocode, moving Cupid as directed.

fly1: Cupid moves one square east
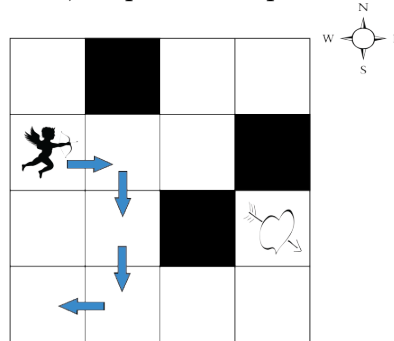
rotc: Cupid turns south

fly1: Cupid moves south one square

fly1: Cupid moves south one square

rotc: Cupid turns west

fly1: Cupid moves one square west

Following this sequence of moves, Cupid ends up in the lower left square on the grid.

(ii) We go through the pseudocode, moving Cupid as directed.
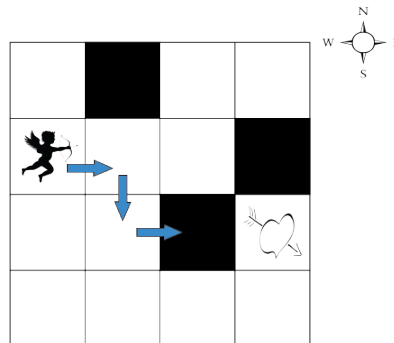
fly1: Cupid moves one square east

rotc: Cupid turns south

fly1: Cupid moves south one square

rotcc: Cupid turns east

fly1: Cupid moves east one square

Following this sequence of moves crashes the code, since Cupid is attempting to move through an obstacle.

(b) There are several possible sets of pseudocode. The two with the least number of instructions are given.

fly1	rotc
rotc	fly1
fly1	fly1
fly1	rotcc
rotcc	fly1
fly1	fly1
fly1	fly1
rotcc	rotcc
fly1	fly1