



Problem of the Week

Problem B and Solution

Shelby's Code

Problem

Shelby is using block coding to draw different shapes.

- (a) Her first program is shown. What shape will be drawn after running this program?

```

on start
pen down
move forward 10 steps
turn right 90 degrees
move forward 10 steps
turn right 90 degrees
move forward 10 steps
turn right 90 degrees
move forward 10 steps
turn right 90 degrees

```

- (b) Using the given blocks, write a program to draw the same shape as Shelby's program, using fewer blocks. Notice that some blocks contain an empty box to be filled with a number.

Blocks	Program
<div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> move forward <input style="width: 20px;" type="text"/> steps </div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> turn right <input style="width: 20px;" type="text"/> degrees </div> <div style="border: 1px solid #ccc; padding: 5px;"> repeat <input style="width: 20px;" type="text"/> times </div>	<div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> on start </div> <div style="border: 1px solid #ccc; padding: 5px;"> pen down </div>

- (c) Using the given blocks, write a program to draw the following shape: You may use a block more than once.

Blocks	Program
<div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> move forward <input style="width: 20px;" type="text"/> steps </div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> turn right <input style="width: 20px;" type="text"/> degrees </div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> turn left <input style="width: 20px;" type="text"/> degrees </div> <div style="border: 1px solid #ccc; padding: 5px;"> repeat <input style="width: 20px;" type="text"/> times </div>	<div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> on start </div> <div style="border: 1px solid #ccc; padding: 5px;"> pen down </div>

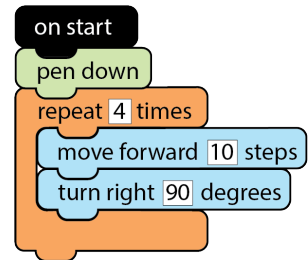


Solution

- (a) This program will draw a square. The table below shows the drawing progress and position of the pen as we trace through the program.

Program Section	Drawing Progress
on start pen down	
move forward 10 steps turn right 90 degrees	
move forward 10 steps turn right 90 degrees	
move forward 10 steps turn right 90 degrees	
move forward 10 steps turn right 90 degrees	

- (b) By using the repeat block, we can use fewer blocks in the program, as shown.



- (c) There are several possible programs, depending on where the pen starts, and how many repeat blocks are used. Two programs are shown.

