Problem of the Week

Problem A

Mystery Code

James wants to send an image to a friend. The image is made up of filled in black squares on a grid. The rows of the grid are labelled with numbers from 1 to 9 and the columns of the grid are labelled from A to Z. James encodes the image by providing a series of short codes. Each short code consists of four parts:

- A letter between A and Z followed by a number between 1 and 9 indicating the column and row of the first square to be filled in on the grid,
- followed by an arrow (↑, ↓, ←, →) indicating the direction to fill,
- followed by a number, indicating the total number of squares to colour.

For example, the short code B2 ↓ 7 tells you to fill in a square at position B2 on the grid, and continue filling in 6 more squares directly below that position. And the short code L6 → 1 tells you to fill in a square at position L6 on the grid and no other squares. This code would have you fill in the grid as shown:

Using the blank grid on the next page, determine the image that James sent using the following codes:

T8 ↑ 7   D4 ← 1   R2 ← 5   I5 → 3   F2 ↓ 7   L8 ↑ 6   C3 → 1

P3 ↓ 6   X2 ↓ 7   E3 ↑ 1   W5 ← 3   H8 ↑ 6   K2 ← 3   B2 ↓ 7
Use the first blank grid to create the image that James sent using the following codes:

\[
\begin{align*}
T8 & \uparrow 7 \\
D4 & \leftarrow 1 \\
R2 & \leftarrow 5 \\
I5 & \rightarrow 3 \\
F2 & \downarrow 7 \\
L8 & \uparrow 6 \\
C3 & \rightarrow 1 \\
P3 & \downarrow 6 \\
X2 & \downarrow 7 \\
E3 & \uparrow 1 \\
W5 & \leftarrow 3 \\
H8 & \uparrow 6 \\
K2 & \leftarrow 3 \\
B2 & \downarrow 7
\end{align*}
\]

An extra blank grid is provided below. Make your own image and provide a classmate with the code that would be used to create your image.

**Strand**  Geometry and Spatial Sense