

You are provided with an image of some dominoes. The image is taken from the top, looking down. The dominoes have colored spots on them. The background is generally dark. The basic color of each domino is generally white.

Each domino has a number of spots on it, and the number of the spots is also represented with the same colors. For example, when a domino has seven spots on one end, the spots are consistently made in purple.

Each domino has the same aspect ratio. They are always the same size. Each end of a domino has some number of spots on it. The numbers for these dominoes may be zero, one, two, three, ... up to nine dots.

It is possible to have the same number of dots on each end of the domino. For example, in Figure 1 on the left side there is one domino that has six dots on both ends. This is called a “double six”. There is also a domino that is a “double seven”, and one that is a “double four”.

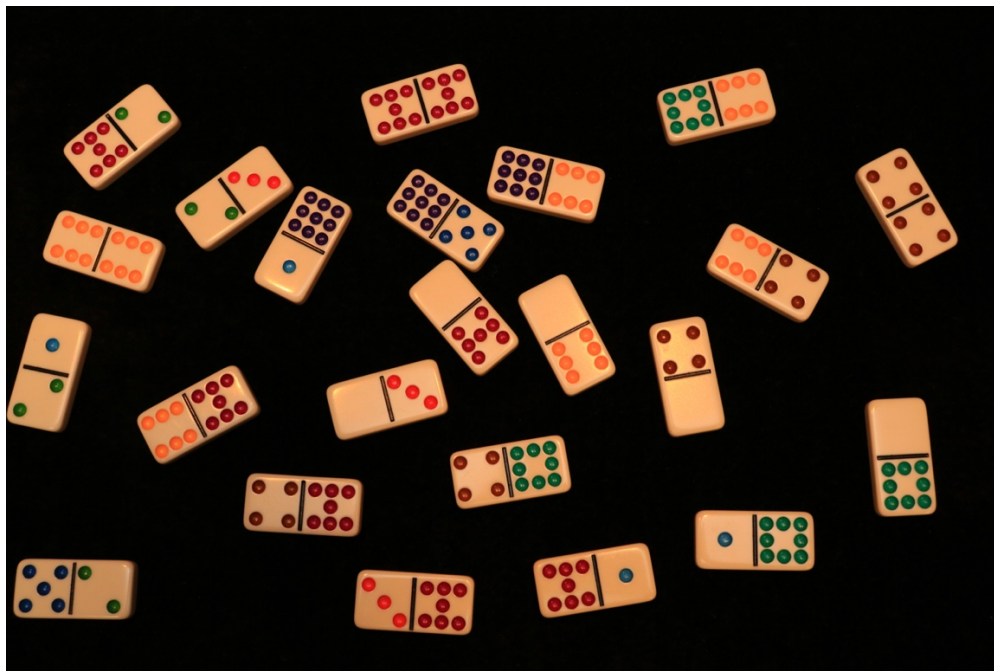


Figure 1- An example input image for domino analysis.

You are trying to get a computer program to help you play a game. Here are the rules:

1. You want to form the longest chain of dominoes that you can.
2. The starting domino for the chain is the domino in the lowest left-hand corner.
For example in Figure 1 the starting domino is a domino with a five blue dots on one end, and two greenish dots on the other end.
3. Other dominoes that might chain off of this starting domino will either have two dots on one end, or five dots on one end.
4. For a given chain, you cannot repeat the same number anywhere in the chain. This means that for the given example, you cannot have another domino that has five spots on it anywhere, or two spots on it anywhere.
5. You cannot use “double” dominoes in your chain. This simplifies the solution for your work.

For the example shown in Figure 1, a possible chain might be:

[9 | 5], [5 | 2], [2 | 3], [3 | 7], [7 | 1], [1 | 8], [8 | 0], [0 | 4], [4 | 6].

This would be a chain that consists of 9 tiles, and you cannot do any better than 9 tiles.

Notice that the chain starts with the domino [5 | 2], and can grow in either direction.

Writeup:

Use one inch margins, single spaced, 10 point font, TimeNewRoman font.

Submit a write-up that includes:

1. A full step-by-step, description of how you processed the image and solved the problem. Write this in English, to show understanding. Provide a high-level overview of how your solution works. (~1 page)
2. Then describe the details of how your program worked. (~1 page)
3. Describe how you were able to get started and running, without having to have all of the code written before hand? How did you break down the problem to solve it? How did you *grow* the solution? (~1 page)
4. Describe the most challenging issues you faced, if any. (~1 page)
Or, did your program run first time through?
5. Write a conclusion (~1 page)

Rubric for the Final Submission:

The program runs and processes the image:	20
The program code is well documented:	20
The program produces an output for an input image, tested by the grader later on:	30
The program correctly prints out the best solution for the given image.	10
Your write-up is complete and shows strong evidence of understanding and learning.	20