Lecture 25

Find all simple digraphs on $\mathcal{G}^2$ vertices.

\[
\text{is simple} \quad \text{(not simple)}
\]

possible underlying graphs:

\[
\text{no edges is allowed)}
\]

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Find all 3-vertex, simple digraphs.

0 edges.

This time, just sort by number of edges. Will skip most cases - see HW key.

3 edges

4 edges

If $D_1$ and $D_2$ are isomorphic, then have isomorphic underlying graphs?
FSA: What language (allowed strings) does this accept?

\[ \{0, 1\} \]

- in these states, string read so far is accepted. (in L)

Evidence:

1, 111, 11111, ...

011110011011000111...

Complete answer:

Allowed are WOG where W has even # of 1s.

\[ \begin{array}{c}
\text{odd} \\
\text{odd}
\end{array} \]

\[ \begin{array}{c}
\text{odd} \\
\text{odd} \\
\text{any thing}, \\
\text{even empty string}
\end{array} \]

More...
Find a FSA that accepts, from words in \{0,1\}, any word with an even number of zeros.

\[ \varepsilon \text{ accepted.} \]

Start State = find State

```
0 0 1 0
```

```
odd
```

d, d, d, ...

```
even
```

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Are we done? Depends on question.

Q: What is the weight of a min-weight path? 7, done.

Q: Find a min weight path? - can finish -
In this case, there are three max-weight paths.