Giving Talks on Research

Whats and Hows

Jifeng Wu

With inspiration from Derek Dreyer, Simon Peyton Jones, Finn Hacket, Robert Xiao

October 27, 2023

Contents

- Whats👈
- Hows

Contents::Whats

- Whats
    - Goals👈
    - Perks

Contents::Whats::Goals

- Get people to read your paper? ❌
- Give people positive feelings about you and your work![1] ✅
- Entertain your audience! ✅
  - "Your mission is to wake them up!" [2]
  - "Your most potent weapon, by far, is your enthusiasm!" [2]
  - "Put on a show!" [3]

[1] Derek Dreyer. How to write papers and give talks that people can follow. (The Cornell, Maryland, Max Planck Pre-doctoral Research School, 2023)
[2] Simon Peyton Jones. How to give a great research talk. (MSR Summer School, 2016)
[3] John Hughes. Unaccustomed as I am to public speaking. (PLMW, 2016)

Contents::Whats::Goals

During the talk:

- *Verbal*
  - Variation in your voice
  - Interesting puns
- *Nonverbal* [1]
  - Eye contact
  - Gestures
  - Moving on the stage

[1] Finn Hacket and Robert Xiao. Workshop on presentation skills.

Contents::Whats::Goals

On the conclusion slide:

- Conclusion sentence
- Acknowledgements
- Website and QR code for publicity

Contents::Whats::Goals

Q&A session:

- Acknowledge good questions.
- Disagreement:
  - Understand their viewpoint.
  - Acknowledge reasonable points.
  - Politely present personal opinion.
- Inability to answer:
  - *Be honest.*
  - Present relevant parts that we *do know*.
  - Anticipate *directions for future work*.

Contents::Whats

- Whats
  - Goals
  - Perks👈

Contents::Whats::Perks

Contents::Whats::Perks

- You can't say much.
- The audience may or may not care.
- The audience may easily get lost.
- You have to convey information visually.

[1] Derek Dreyer. How to write papers and give talks that people can follow. (The Cornell, Maryland, Max Planck Pre-doctoral Research School, 2023)

A ~~paper~~ talk structure that works[1]

- ~~Abstract~~
- Introduction (8 minutes)
- Key ideas (11 minutes)
- ~~Technical details~~
- ~~Related work~~
- *Conclusion slide*

[1] Derek Dreyer. How to write papers and give talks that people can follow. (The Cornell, Maryland, Max Planck Pre-doctoral Research School, 2023)

Contents::Whats::Perks

- Intro (8 minutes)
    - Stage the motivation!
        - General version of your problem (2 minutes)
        - Your specific problem (4 minutes)
    - Tell them what you did!
        - Contributions
        - Overview of the key ideas

[1] Derek Dreyer. How to write papers and give talks that people can follow. (The Cornell, Maryland, Max Planck Pre-doctoral Research School, 2023)

Contents::Whats::Perks

Coherence [1]:

- Be minimal. [2]
- Make the focus obvious. [2]

Flow [1]:

- Be incremental. [2]
- Introduce concepts when we need them. [2]

[1] Derek Dreyer. How to write papers and give talks that people can follow. (The Cornell, Maryland, Max Planck Pre-doctoral Research School, 2023)

[2] Ranjit Jhala, "How to Design Talks".

Contents

- Whats
- Hows👈

Contents::Hows

- Hows
  - Tools👈
  - Note-taking
  - Practicing

Contents::Hows::Tools

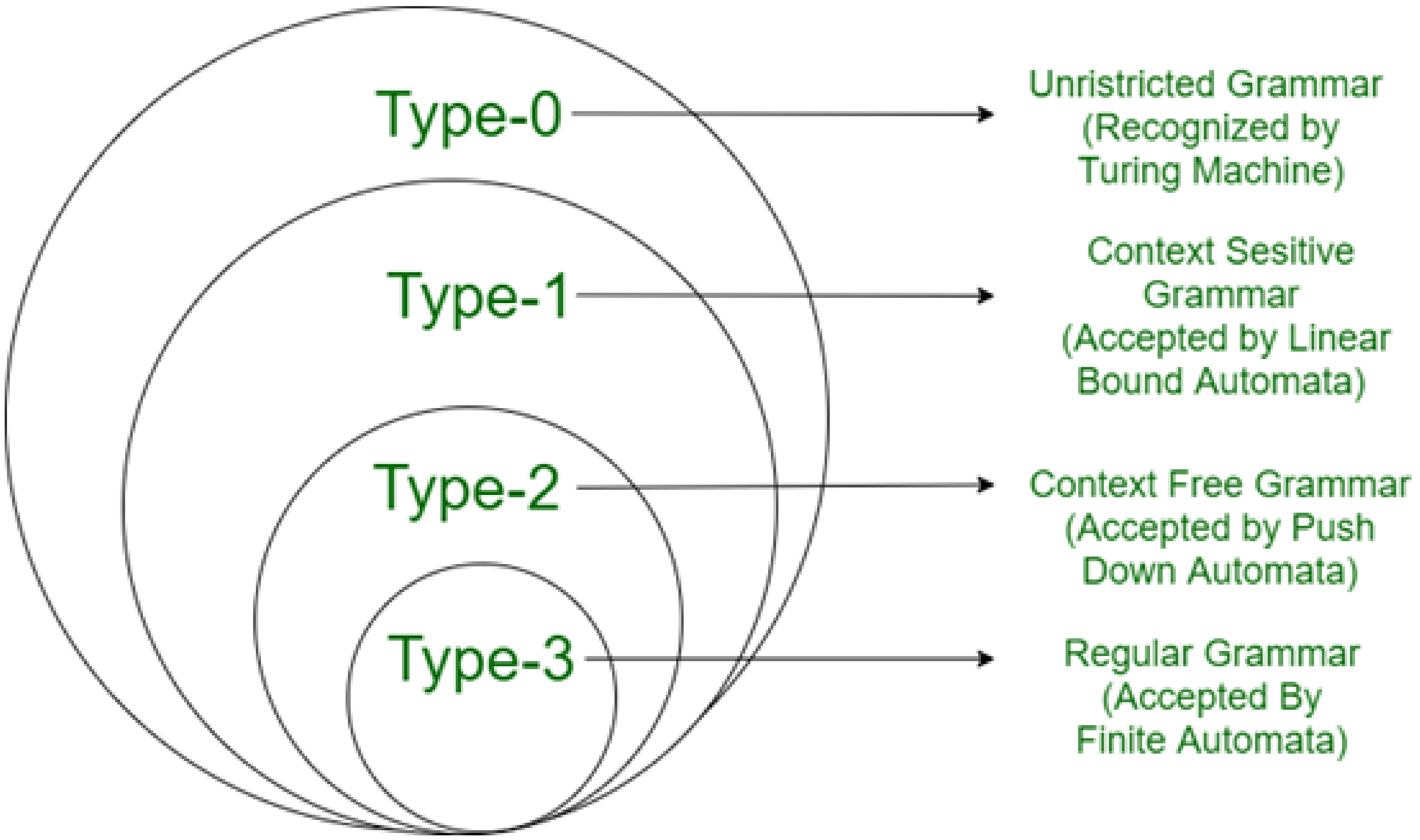
- Slides👈
- Figures

Tools with decreasing *expressiveness*

- Presentation programs
- Beamer
- Frameworks for designing presentations with *Markdown dialects*
  - Rmarkdown[1]
  - Marp[2]
  - Pandoc[3]

[1] https://rmarkdown.rstudio.com/
[2] https://marp.app/
[3] https://pandoc.org/

Powerful ≠ Best for the job



Unristricted Grammar (Recognized by Turing Machine)

Context Sesitive Grammar (Accepted by Linear Bound Automata)

Context Free Grammar (Accepted by Push Down Automata)

Regular Grammar (Accepted By Finite Automata)

Aspects to consider

- *First-class support* for features including:
  - Animations
  - Block quotations
  - Code blocks
  - Math expressions
  - Citations
  - Interactive visualizations
- Integration with the rest of the research pipeline
- Collaboration

Contents::Hows::Tools

- Slides
- Figures👈

Figures

"Diagrams are pictorial, yet abstract, representations of information. Line graphs, bar charts, engineering blueprints, and architects' sketches are all examples of diagrams, whereas photos and video are not." [1]

- Diagrams👈
- Other Figures

[1] Michael Anderson (1997). "Introduction to Diagrammatic Reasoning"

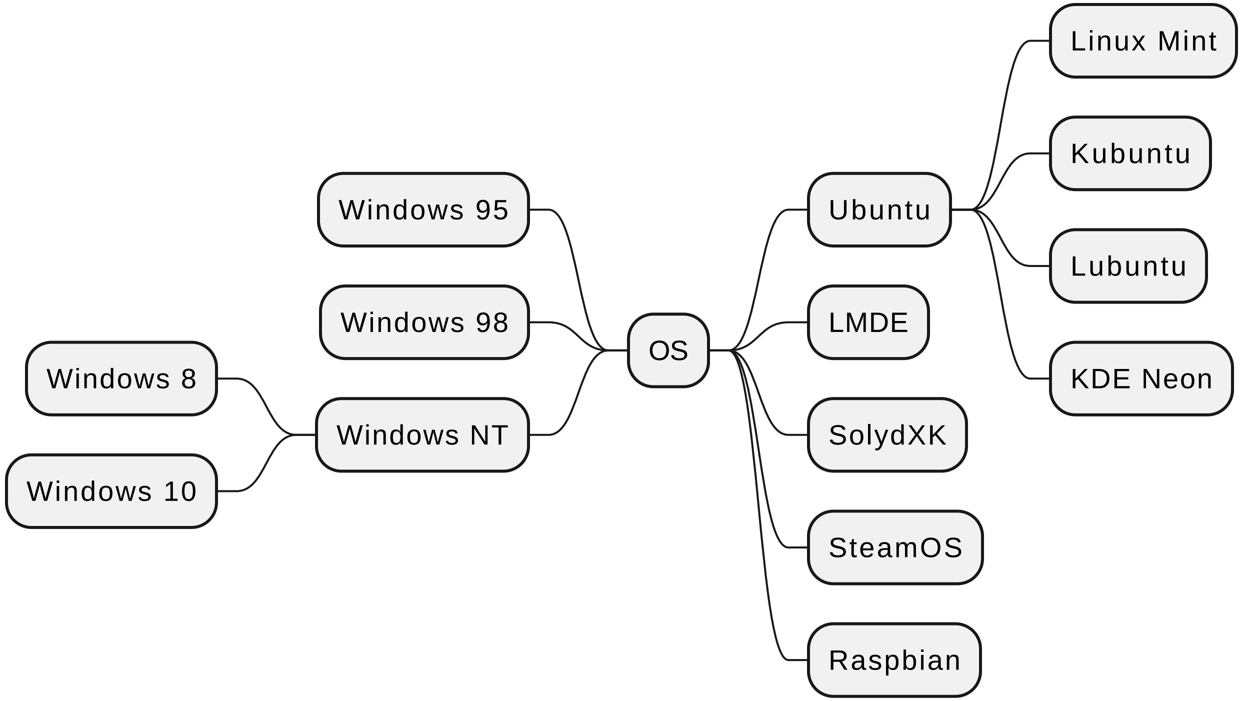
Diagrams

- Quantitative Diagrams
  - *Please search "data visualization tools"*
- Qualitative Diagrams👈

Qualitative Diagrams

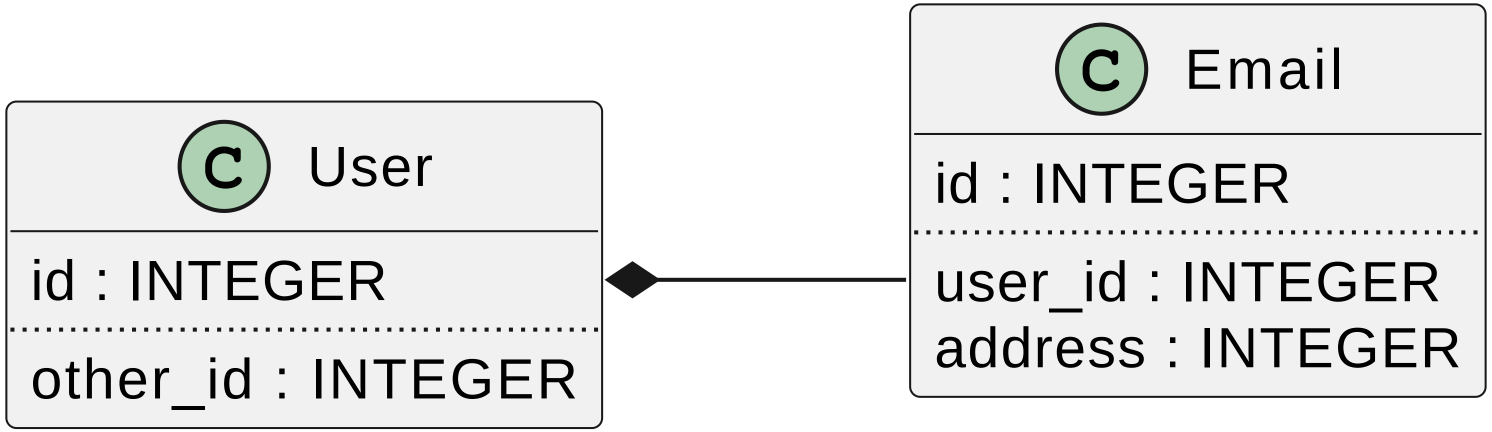
- Existing Models👈
- From Scratch

Mindmaps[1][2]



[1] https://mermaid.js.org/syntax/mindmap.html
[2] https://plantuml.com/mindmap-diagram

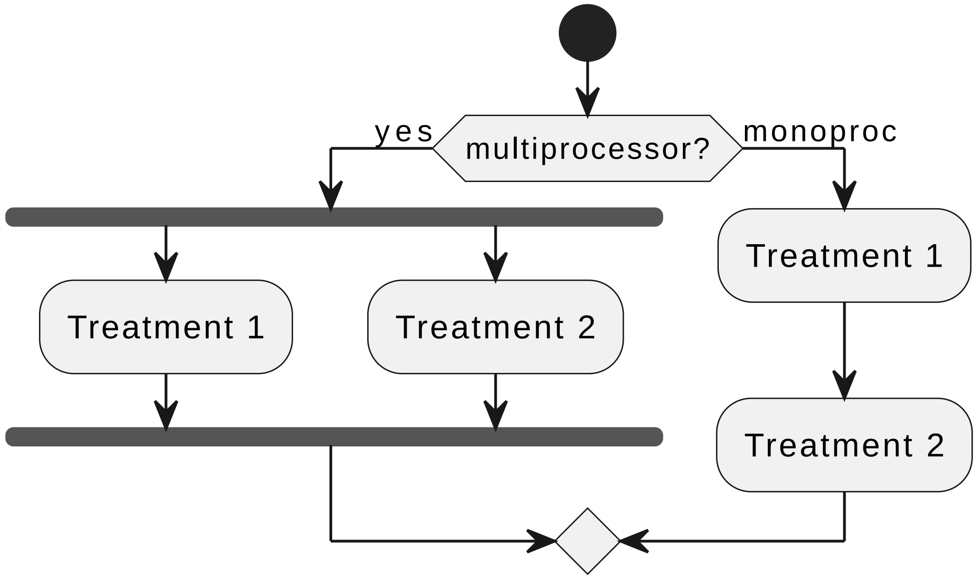
Class Diagrams[1][2]



[1] https://mermaid.js.org/syntax/classDiagram.html

[2] https://plantuml.com/class-diagram

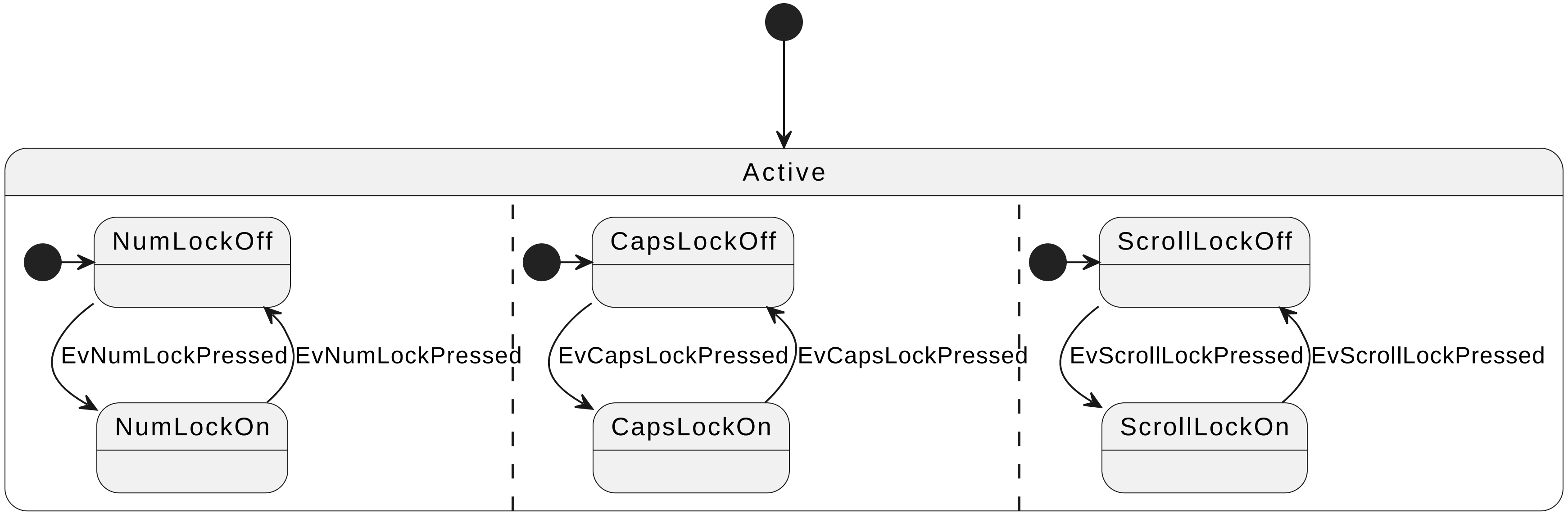
Flowcharts[1] and Activity Diagrams[2]



[1] https://mermaid.js.org/syntax/flowchart.html

[2] https://plantuml.com/activity-diagram-beta

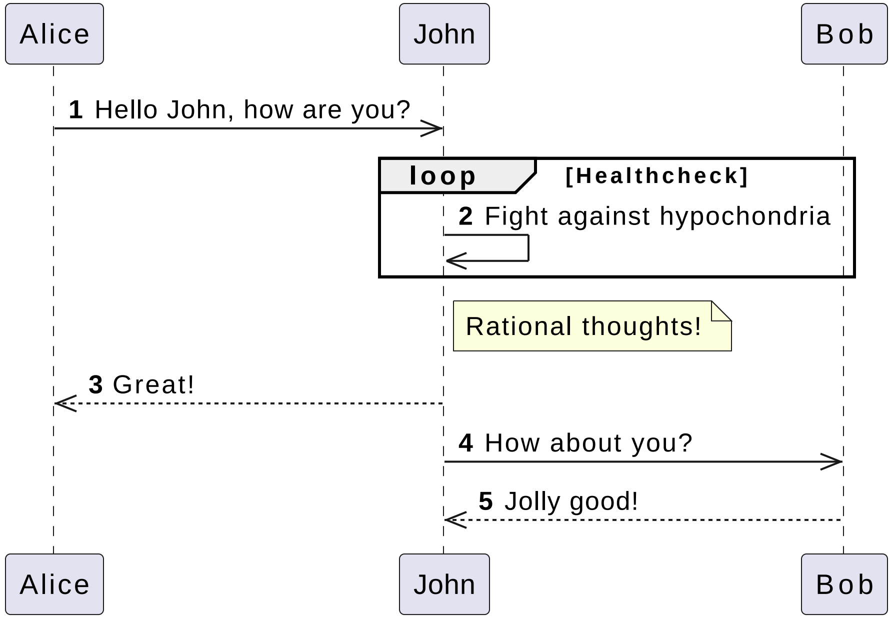
State Diagrams[1][2]



[1] https://mermaid.js.org/syntax/stateDiagram.html

[2] https://plantuml.com/state-diagram

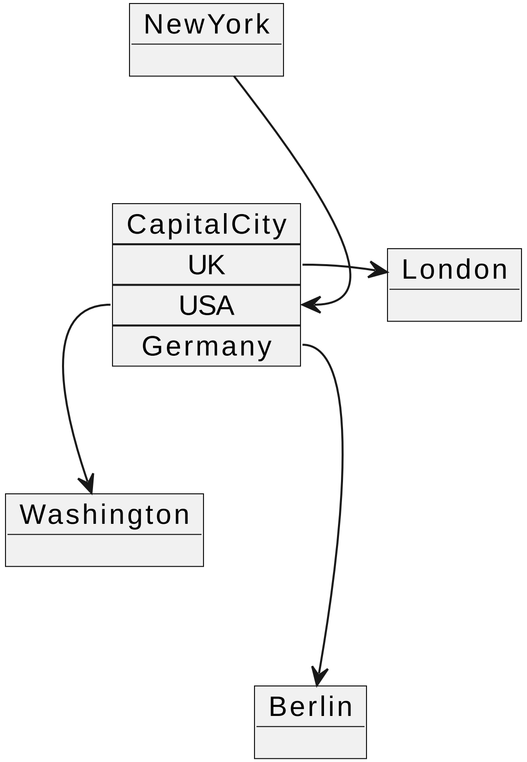
Sequence Diagrams[1][2]



[1] https://mermaid.js.org/syntax/sequenceDiagram.html

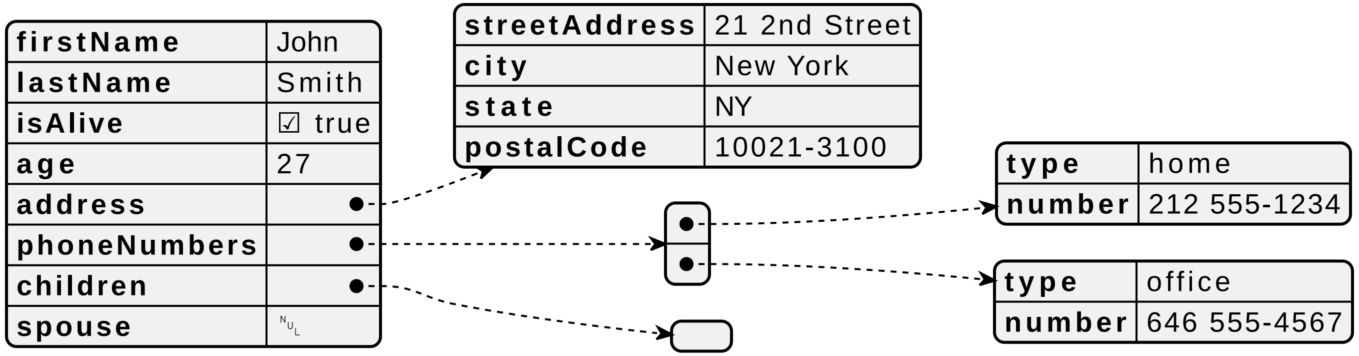
[2] https://plantuml.com/sequence-diagram

Object Diagram[1]



[1] https://plantuml.com/object-diagram

JSON[1]



firstName	John
lastName	Smith
isAlive	☑ true
age	27
address	●
phoneNumbers	●
children	●
spouse	NUL

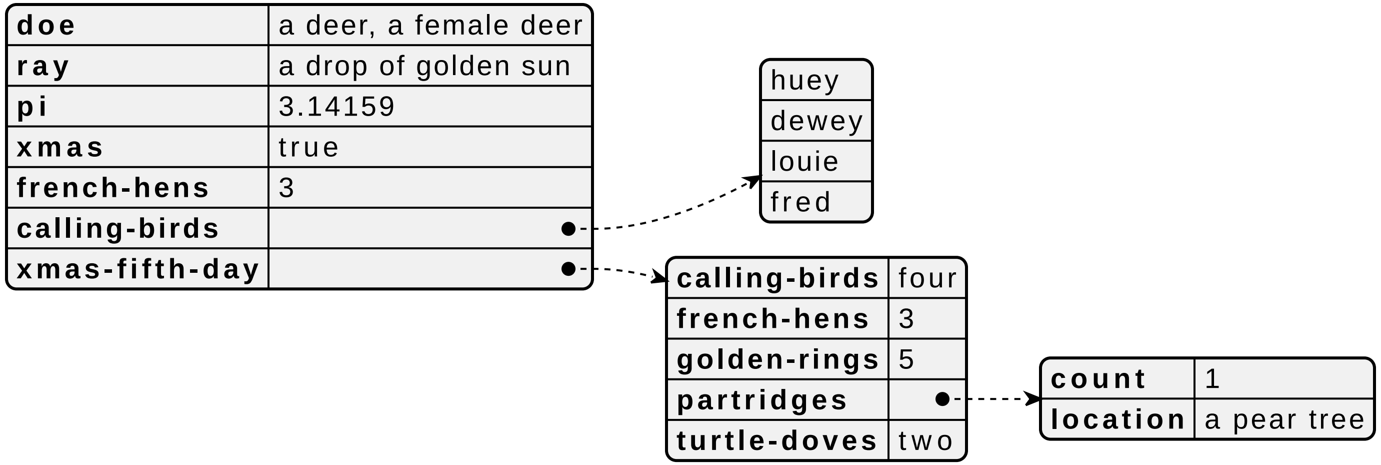
streetAddress	21 2nd Street
city	New York
state	NY
postalCode	10021-3100

type	home
number	212 555-1234

type	office
number	646 555-4567

[1] https://plantuml.com/json

YAML[1]



doe	a deer, a female deer
ray	a drop of golden sun
pi	3.14159
xmas	true
french-hens	3
calling-birds	●
xmas-fifth-day	●

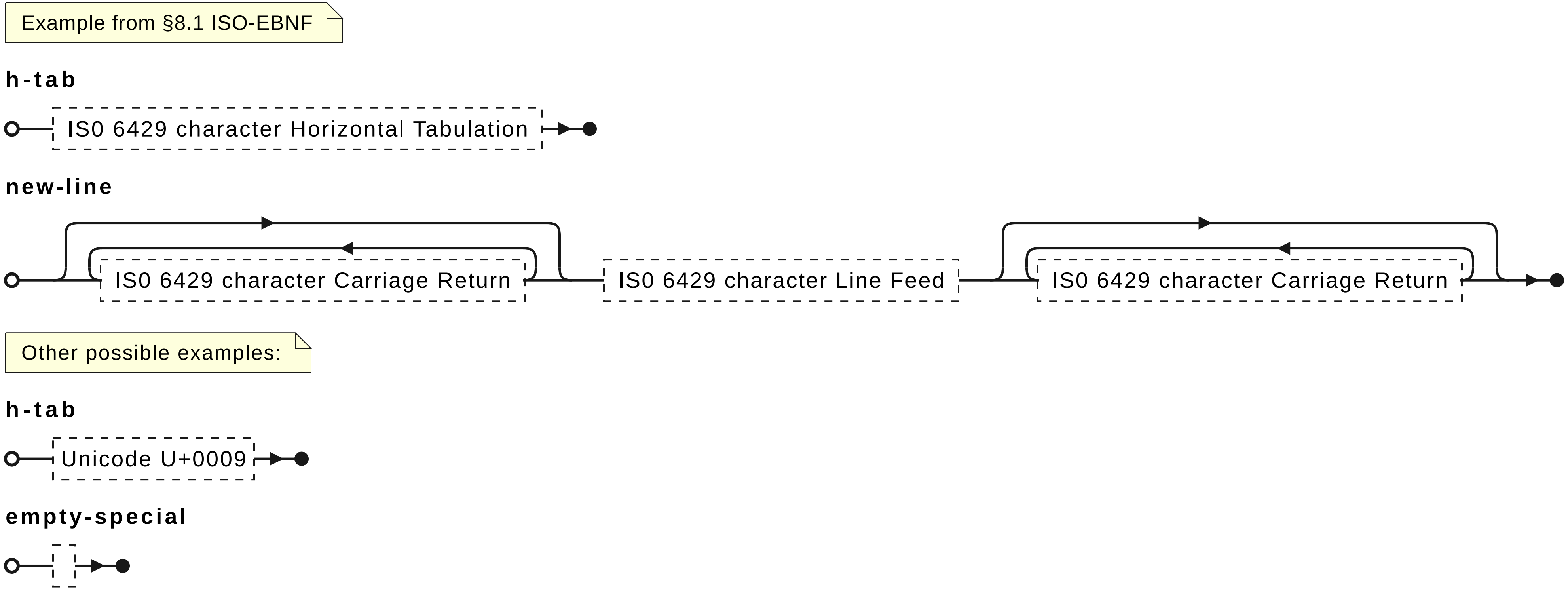
huey
dewey
louie
fred

calling-birds	four
french-hens	3
golden-rings	5
partridges	●
turtle-doves	two

count	1
location	a pear tree

[1] https://plantuml.com/yaml

EBNF[1]



Example from §8.1 ISO-EBNF

h-tab

IS0 6429 character Horizontal Tabulation

new-line

IS0 6429 character Carriage Return

IS0 6429 character Line Feed

IS0 6429 character Carriage Return

Other possible examples:

h-tab

Unicode U+0009

empty-special

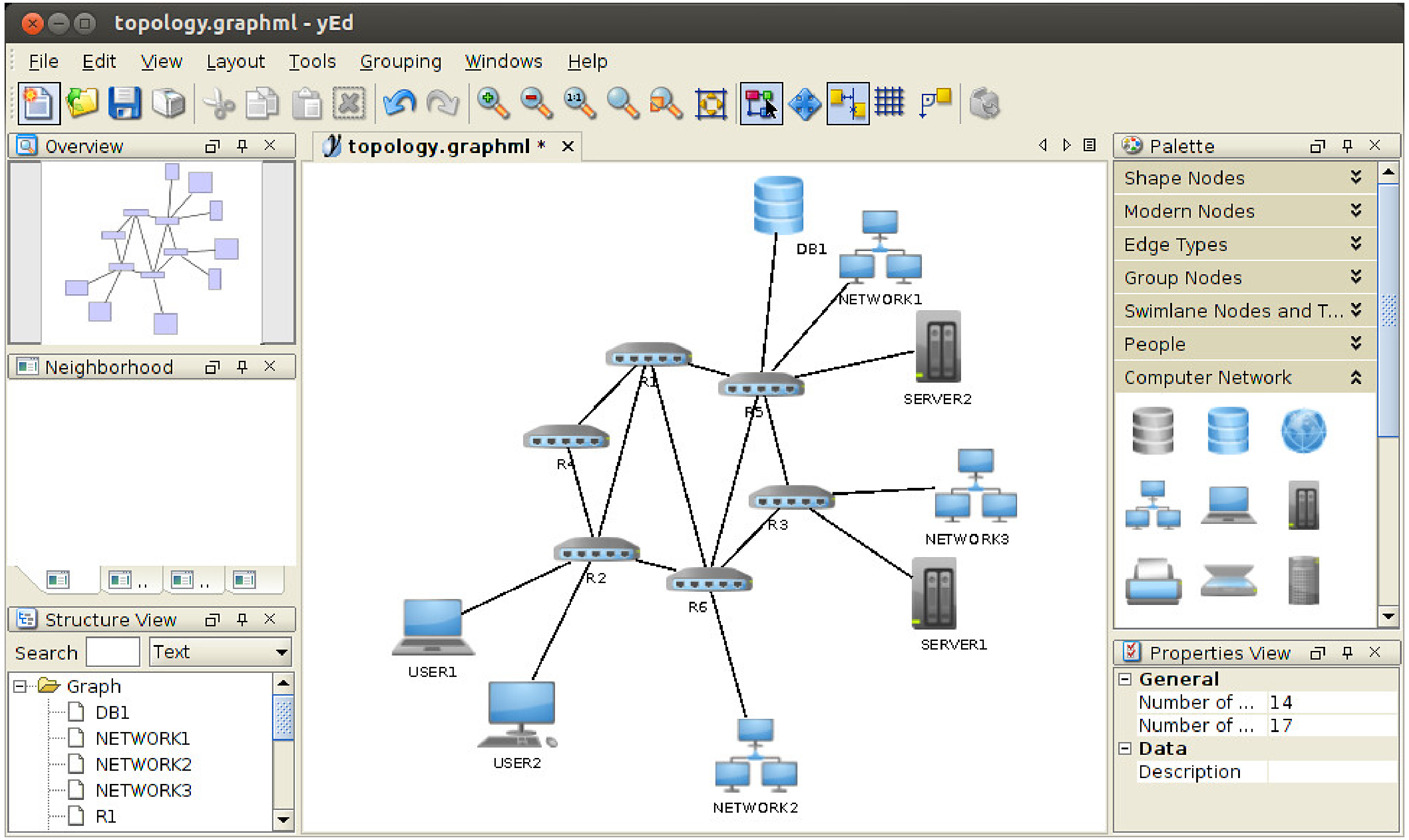
[1] https://plantuml.com/ebnf

Qualitative Diagrams

- Existing Models
- From Scratch👈

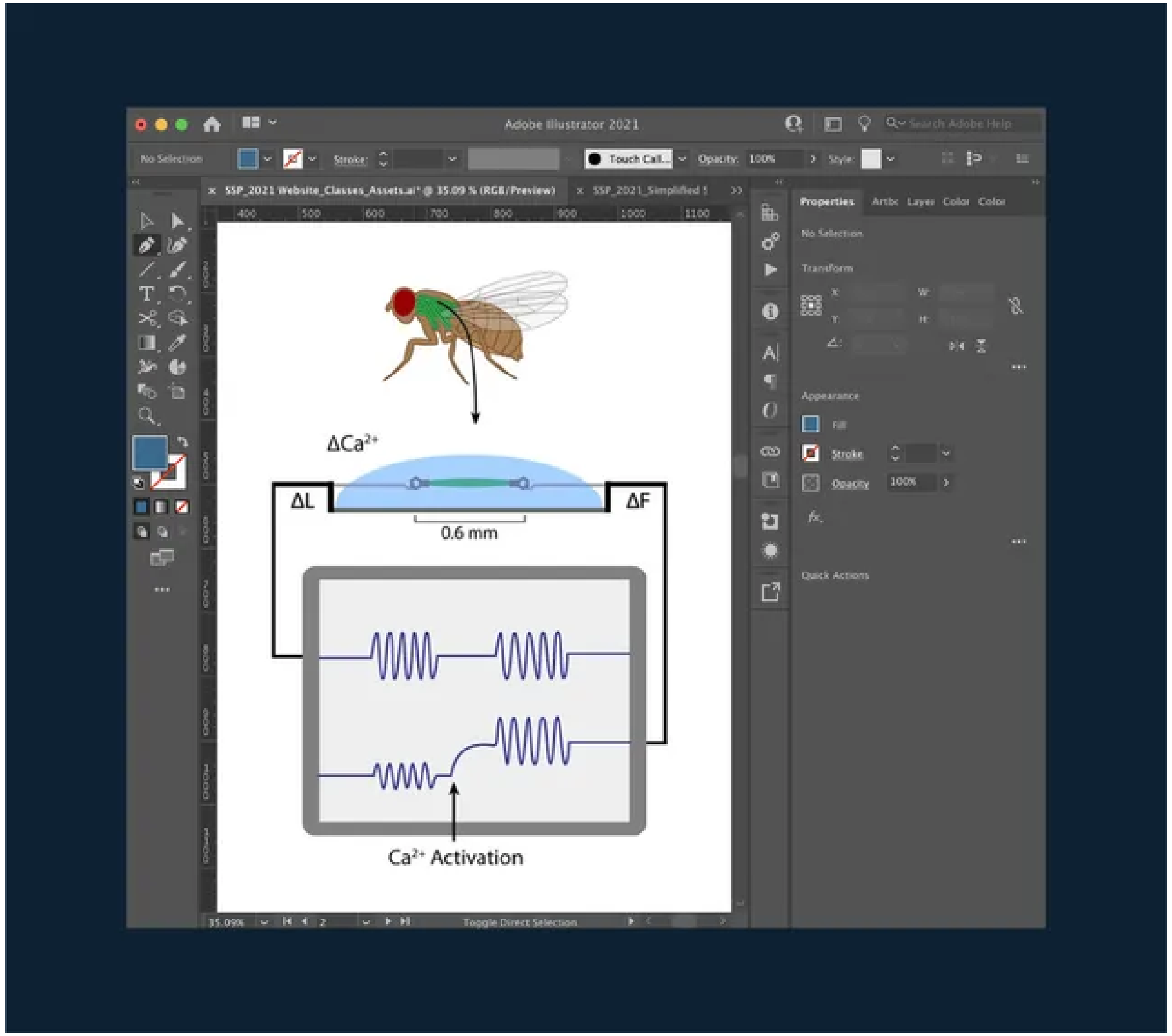
Contents::Hows::Tools::Diagrams::Qualitative Diagrams::From

Structured:



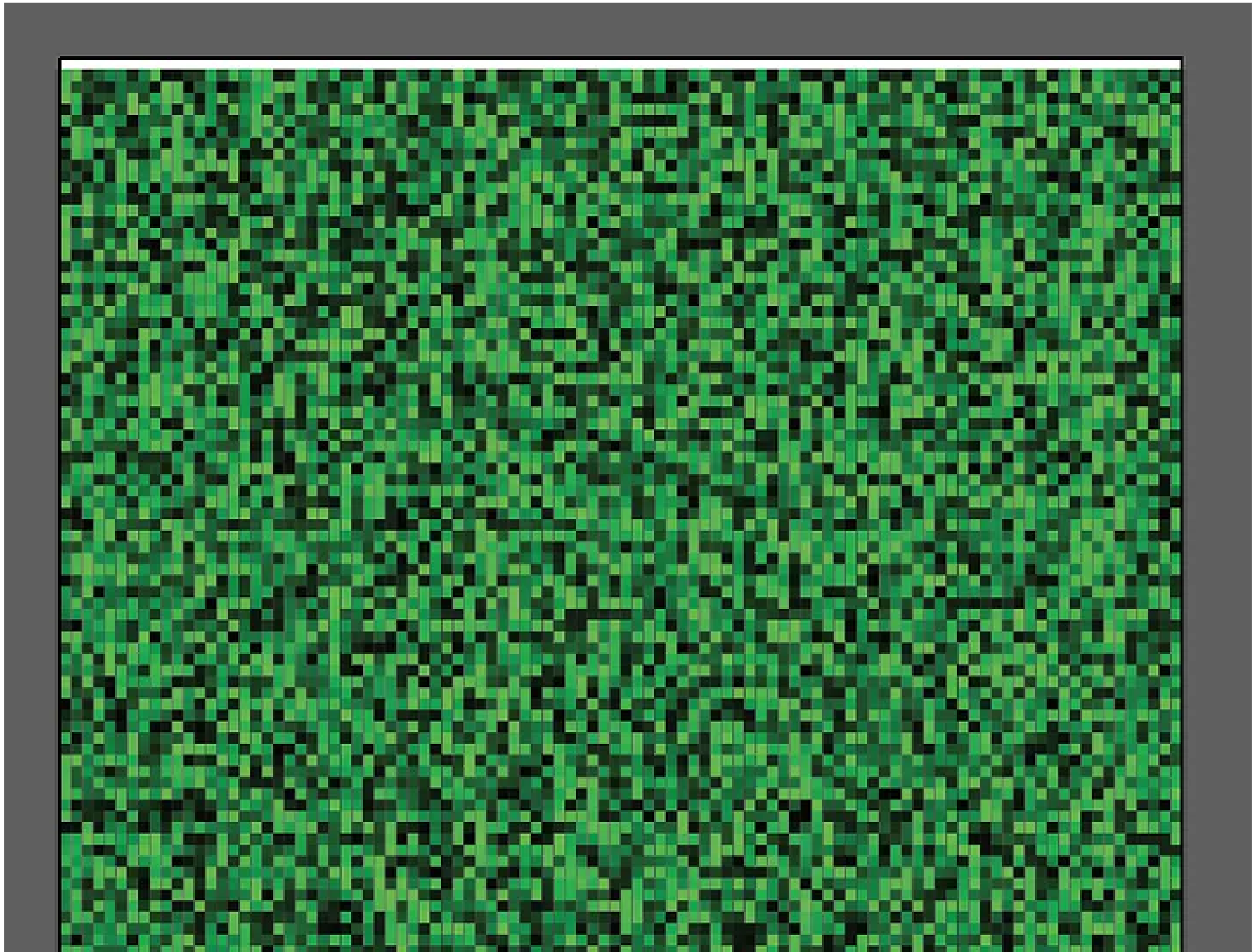
Contents::Hows::Tools::Diagrams::Qualitative Diagrams::From

Unstructured: make sure to leverage existing *stock images*!

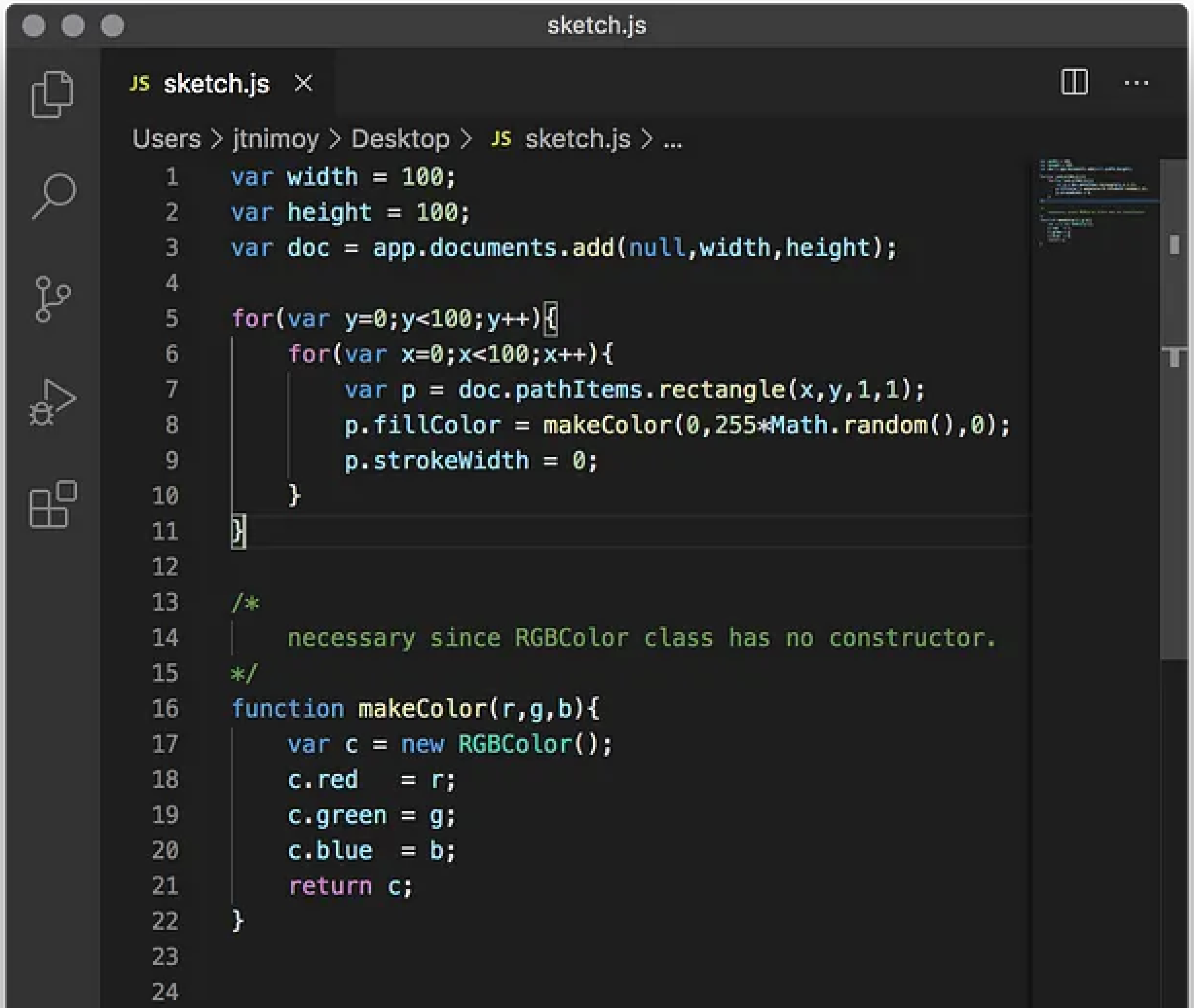


Contents::Hows::Tools::Diagrams::Qualitative Diagrams::From

What if it is complicated, but there are patterns?



Scripting to the rescue!



```
var width = 100;
var height = 100;
var doc = app.documents.add(null,width,height);

for(var y=0;y<100;y++){
    for(var x=0;x<100;x++){
        var p = doc.pathItems.rectangle(x,y,1,1);
        p.fillColor = makeColor(0,255*Math.random(),0);
        p.strokeWidth = 0;
    }
}

/*
    necessary since RGBColor class has no constructor.
*/
function makeColor(r,g,b){
    var c = new RGBColor();
    c.red   = r;
    c.green = g;
    c.blue  = b;
    return c;
}
```

Contents::Hows::Tools::Diagrams::Qualitative Diagrams::From

- JavaScript scripting for Adobe Illustrator[1,2]
- Python scripting for Inkscape[3]
- Python scripting for GIMP[4]

[1] https://medium.com/@jtnimoy/illustrator-scripting-in-visual-studio-code-cdcf4b97365d
[2] https://ai-scripting.docsforadobe.dev/
[3] https://inkscape.org/~pakin/★simple-inkscape-scripting
[4] https://medium.com/@chriziegler/introduction-to-python-scripting-in-gimp-141b860ad7e

Contents::Hows

- Hows
  - Tools
  - Note-taking👈
  - Practicing

Contents::Hows::Note-taking

Different people have different habits[1]:

- Full written script?
- Talking points?
- No notes at all?

Contents::Hows::Note-taking

Personal approach:

1. Try to deliver the talk *impromptu* in front of the computer.
2. When feeling *stuck* or *awkward*, think about how to present the content, and write notes.

Contents::Hows

- Hows
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With whom?

- Yourself
- Your supervisor
- Other people from your lab
- People from other labs
    - *Ignorance is a plus.*[1]

Conclusions

We can all give great talks!

Follow my personal website at abbaswu.github.io!