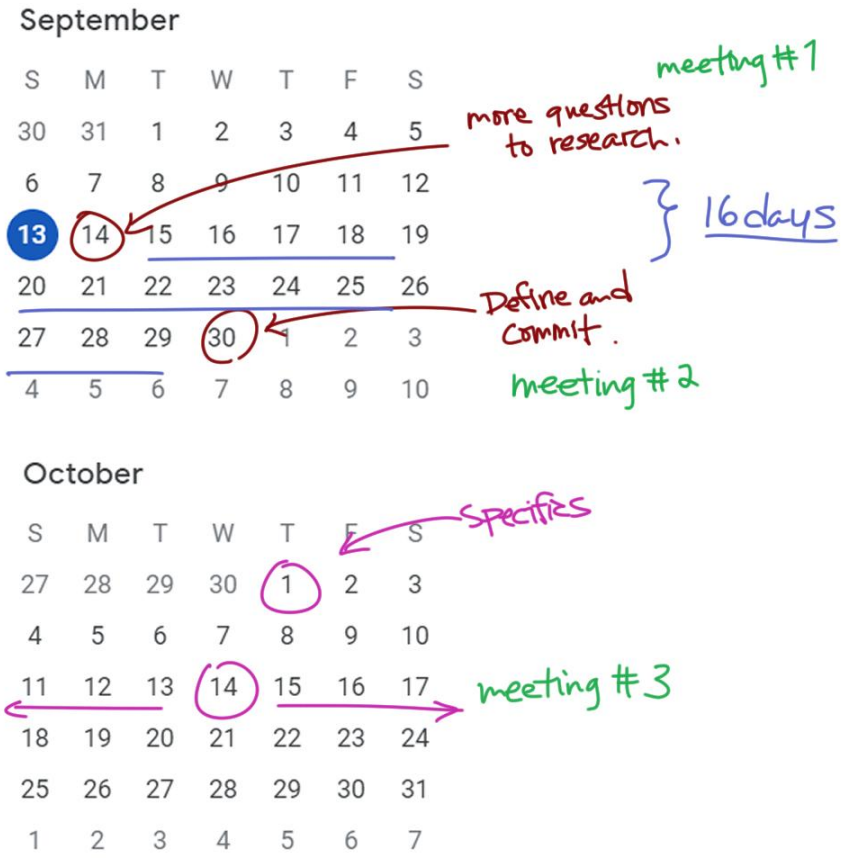
Meeting 2

kense, for the thesis

Scheduling

- Define and Commit
- Prep for setting up research (Specifics)
- Development
- Writing



Recap

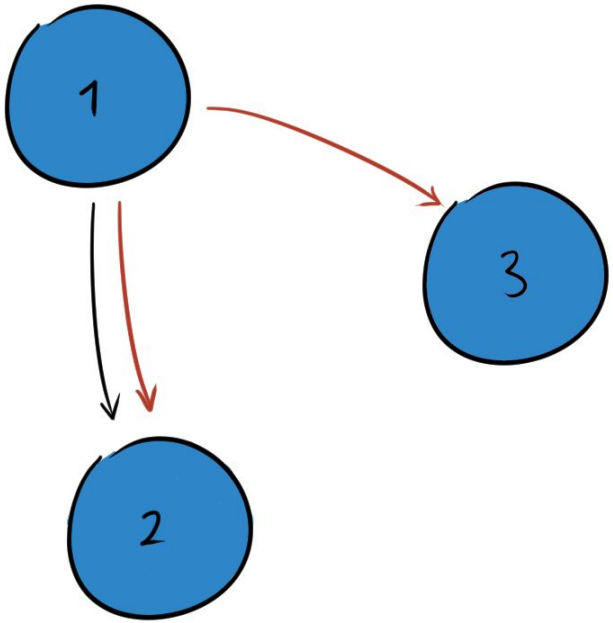
- Graph games
- Discussion on sample conversations and definitions

Tasks

- Sample conversation graph
- Considerations on how the graph is generated
- Define the research problem

Node Embeddings

- Supervised training process
- Focused on connections between nodes (“edge detection”)
- Lots of literature on improvements/benchmarks and datasets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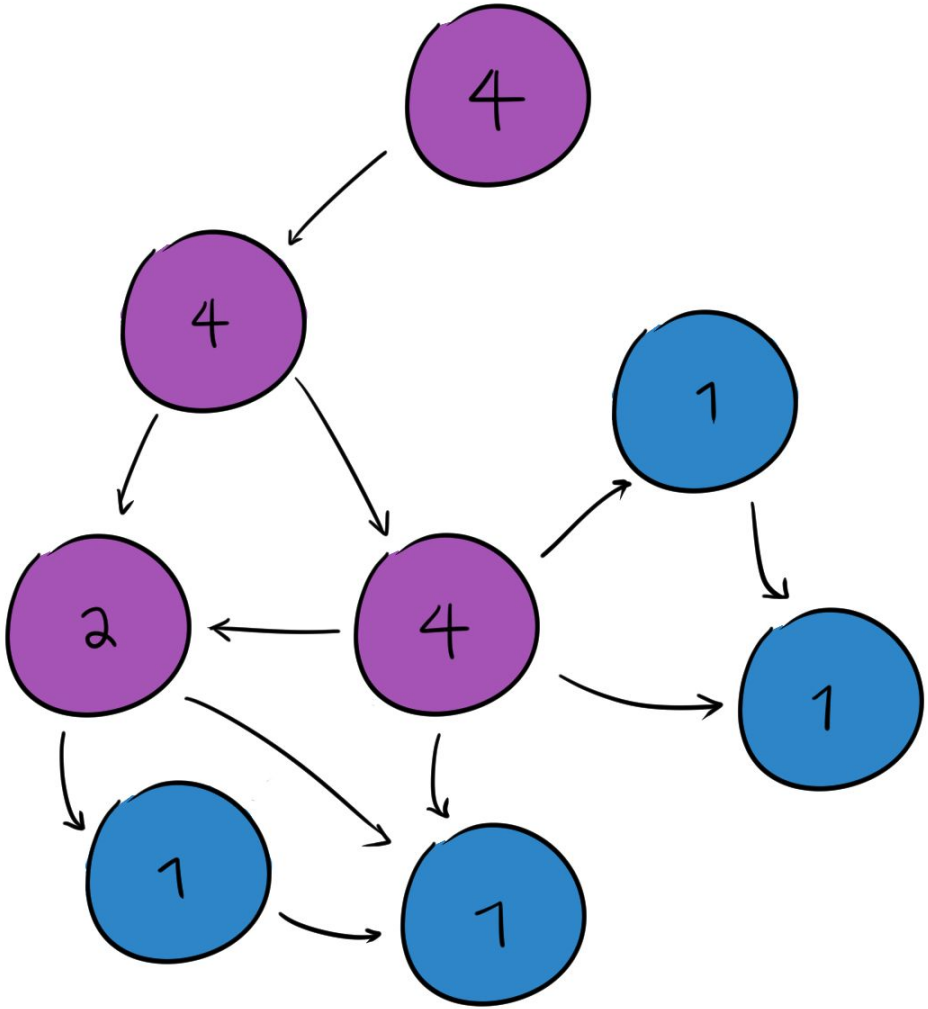
K-Degeneracy

- Graph *G* is *k*-degenerate if all of its sub-graphs have a vertex of degree at most *k.*
- Define *k*-core as the maximal connected sub-graph of *G* where all vertices have a degree of at least *k.*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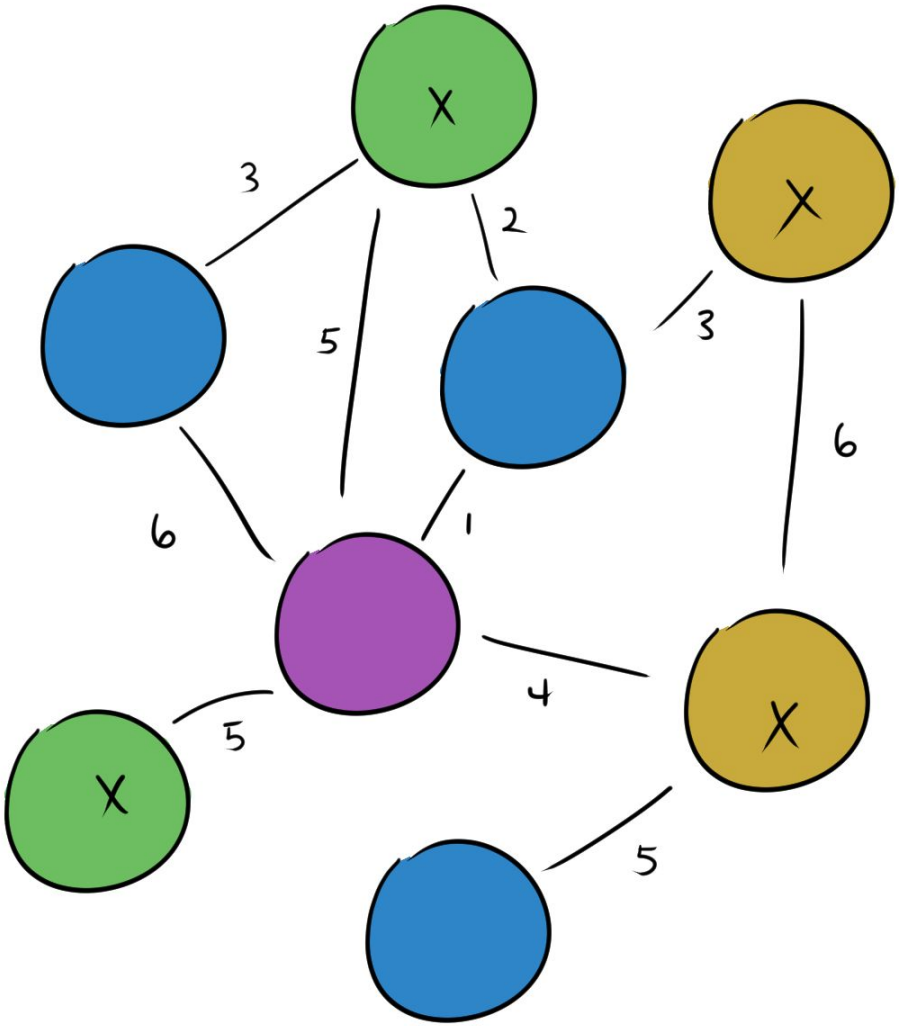
Landmarks/Critical Nodes

- Landmark is a node that for any two vertices $u, v \in G$, the landmark node ℓ has a different distance to u and v.
- Landmark node *distinguishes* u and v.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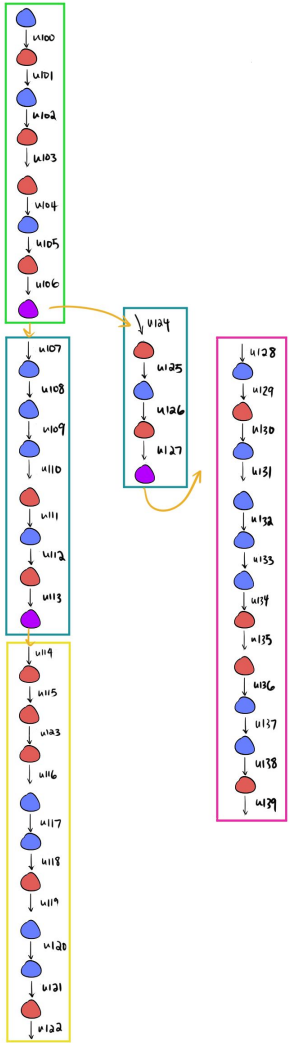
Graph Generation

- Option 1
  - Traces of conversation as data, with utterances as smallest unit
  - Add landmarks/critical nodes manually as training data
  - Supervised training on edge-detection for graph creation (made from possible vocab)
  - Produced graph is some sort of possible conversation paths graph
- Option 2
  - Traces of conversation as data
  - Use a trained-model to cluster the utterances into blocks of conversation over the same topic/intent (smallest unit is now conversation)
  - Supervised training on edge-detection for graph creation
  - Produced graph is some sort of “flow of conversation” graph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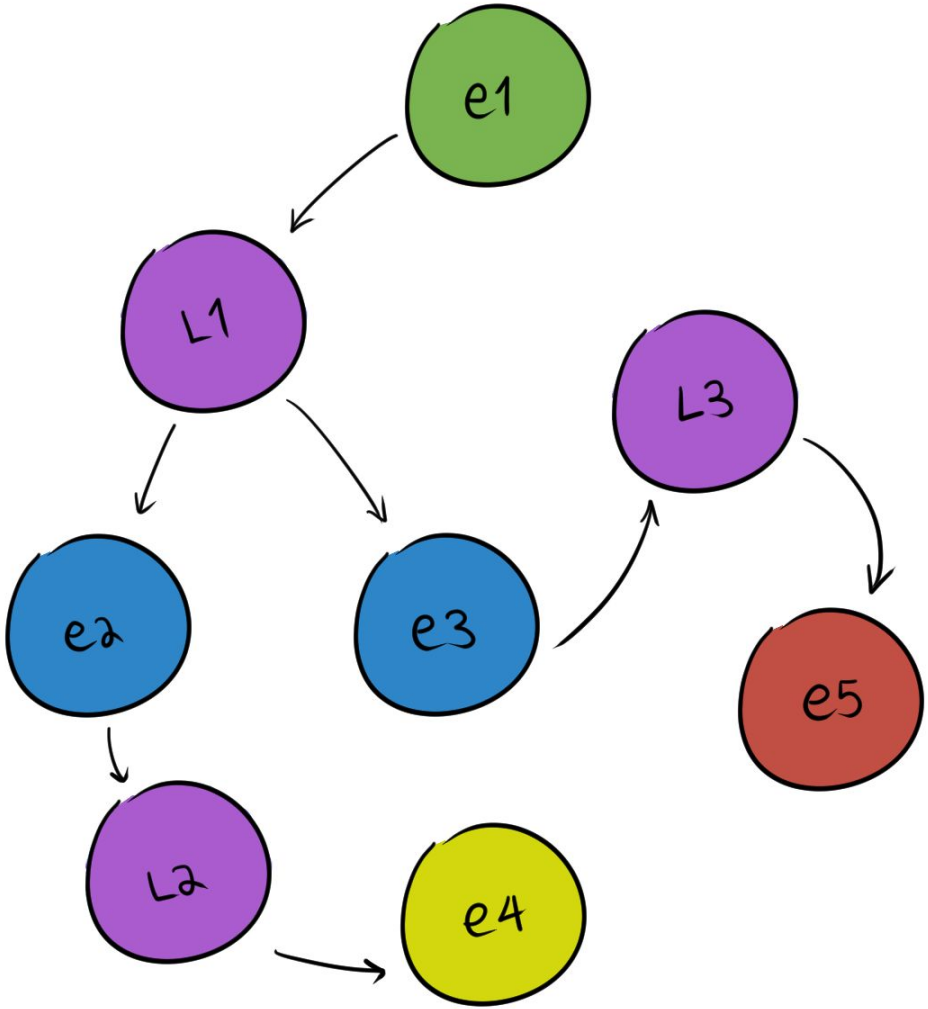
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e2
e3
e5
L2
e4

Further Considerations

- Disfluency
- LTL specifications for semantic modeling
- Adding an Energy-game variation/distance metric (weights)

Research Questions

- Difficulty defining the problem to address, commitment issues, etc
- *“... apply notions of formal modeling to provide some sort of framework for analysis in order to solve issues that the field traditionally applies language models and machine learning in order to “numerically” solve.”*