

Modelling human knowledge, part II

Who do I work with?	Today, you will work alone , and submit your own work for grading. Next Monday, you'll work in a pair.
How do I get a grade?	Submit your individual work on the course website. The server closes at 4:30
What do I submit?	You will submit a ZIP file containing four files with specific names : <ul style="list-style-type: none">- a word document named <i>First_Last_Report.docx</i>.- the CSV file listing the map from last week, named <i>First_Last_map1.csv</i>- the CSV file listing your map after structural analysis, <i>First_Last_map2.csv</i>- the CSV file listing your final map for today, <i>First_Last_map3.csv</i> Points will be deducted if files are not named as stated above.

1) Setting up ActionableSystem for structural analysis

- Go to <https://osf.io/7ztwu/>
- Download "Ready to use.zip" and "Sample maps.zip"
- Unzip both archives
- In "Ready to use", start ActionableSystem using the jar file (*i.e.* ActionableSystems.jar)
- Open the map you created last week
 - If** your map does not open, or what shows up on the screen doesn't look right, then:
 - Open a sample (edges) maps with notepad to see how it's formatted. Reformat your file.

2) Conducting structural analysis

Complex real-world problems are complex in part because they are produced by systems with many loops (of different types and lengths) and many disjoint paths between pairs of concepts. Due to cognitive limitations, we easily forget loops and disjoint paths. Your goal is to use ActionableSystems to consciously bring the loops and disjoint paths that your map may not initially have captured.

- In your word document from last week, create **a new section** named "Structural Analysis".
- In ActionableSystems, under *See*, use "Analyze Cycles" and "See the pathways between two factors". If you're not sure how to use the pathways tool, use the tutorial. In your word document, explain all of the cycles (as well as types) that are present in your map. Identify a few disjoint paths.
 - If your map had no cycles and no disjoint paths, then just state so.
 - You can't *remove* edges from your map to simplify it. The instructor has your map's file too.
- Copy the file of your map, and rename it as `First_Last_map2.csv`
- By iteratively editing the file for your map and exploring it with ActionableSystems:
 - ensure that your map has loops, of different types (balancing/reinforcing) and different lengths (they can't all be of length 2 or 3)
 - ensure that some pairs of factors are connected in multiple ways (*i.e.* disjoint paths). The paths may be of different lengths.
- **Once you're done transforming your map**, create a new section in your word document named "Structural Transformation". List the changes you've made them, and why you think they're valid. That is, you can't add loops just because you've been asked to: they also need to be plausible.

By completing of this section, you have **produced a new map, and added two sections to your report.**

3) Case studies

Read the two case studies behind the page. When reading them, *think* about:

- What are the main points of the case?
- How are the experiences in this case similar/different to the case of Pleasantville?
- How might you apply the lessons learned to the Pleasantville case? What lessons are specific to this case and should not be applied?

- **Create your final map `First_Last_map3.csv`**. Instead of just + and -, express the strength of causation. You can use the notation VS (Very Strong), S (Strong), M (Medium), L (Low), and L (Very Low). For instance, writing "A,B,-VS" means that as A increases, it very strongly decreases B.

Impact on existing residents

"Thank you all for coming today to our budget meeting", the Mayor of Happy Valley said as she closed the door. "I've invited you all here today as I prepare for my speech about the state of our city that is coming up in a few weeks. As you know, we had a rough patch for a number of years, but it seems like our economy has been trending upward since the online retailer, HomeStore, opened up here. Can you give me some talking points to share with our voters?"

Sanjeev, the city planner, was first to speak up. "I think we have some strong numbers that the townspeople will be happy to hear. It's true that HomeStore brought in a number of computer science jobs, as we expected. On top of that, it seems like some related markets are feeling its effects, so it's really impacting the whole city."

"What do you mean? What specifically has been impacted?" the Mayor asked.

"Well, the number of jobs definitely increased, but we didn't expect the impact on the additional services industry. As you know, the realtors had a pretty cold market for a number of years. While it's true we eased the burden of the corporate tax for HomeStore, we are seeing additional tax revenue through the new residents in our city now that our population has grown."

"Based on this, I've had some interesting meeting with some of our local governmental partners. For example, the superintendent of the school district and I were trying to get projections because they are seeing a growth and want to hire new teachers and maybe even hire some new specialists in math and reading. The library was also able to add in a new children's section due to all the influx of families. I know the hospitals are also thinking of adding in a new wing and upgrading some of their technology to accommodate all of the new residents. The tax revenue has really helped improve our government services after so many people left, especially since most of the people that left were our high earners who could afford to leave."

"That's great" the Mayor exclaimed. "I know we took it on the chin when it was first announced, but I think our residents will be happy to hear that. If you hear anything else as you prepare, please feel free to let me know. I think our residents will be happy to hear about the improvements and how we've emerged after our town has been through such a difficult time."

Impact on existing businesses

Sanjeev had entered the office and had just settled in when he heard a knock on his door. "Come in," he said as he sat in his chair.

"Hey Sanjeev, I know I dropped in unexpectedly, but can I talk to you about a new project?", Dustin asked.

"Sure, come on in. Seems like I've been seeing a lot of you recently with all the new developments going on." Sanjeev asked. "What new project do you have going on this time?"

"With you being the city manager, we've been seeing a lot of each other with all the new developments. Well, it's actually not a new building time, but a reconstruction. With the new online retailer, HomeStore, coming into town, we got the contract to redevelop some old warehouses into new apartments downtown near the headquarters."

Sanjeev looked at the permit. "I see. I can see this being pretty popular since it overlooks the water and is pretty close to the headquarters that just moved in. I mean, it makes a lot of sense too. Since HomeStore has come into town, I've also signed a couple of permits near downtown for things like restaurants, grocery stores, and gas stations. Where you are looking at will be pretty interesting since a pretty cool art district and music scene has emerged given all these new employees."

Dustin sat down. "Yeah, business is definitely booming thanks to HomeStore. I knew that we would get some development work, but I didn't expect that we would get all these outside markets coming into town now that our economy has stabilized. I know that a new Whole Foods and big movie theatre just opened up now that we finally have a good set of workers around that area."

Sanjeev nodded. "You are right. It's funny how all these things are tied together. In the next week I also have a meeting with a minor league baseball team that is looking at building a stadium on the vacant lot now that confidence in our economy has grown. It's pretty cool how we brought in a business, but also brought in some of these other things which add amenities to our city."