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Monday 06/06

The Boston housing dataset from Kaggle has only 1460 rows, which seems less for causality analysis. So I found another housing dataset that has 384977 listings with 22 columns, which includes

- price data
- latitude
- longitude
- number of bedrooms
- number of bathrooms
- square footage of the house
- state
- type of house (apartment, condo, house etc.)

Since the original hypothesis was based on intuition and it holds for this dataset as well. So change in the hypothesis was not required. I started learning to write code in ECL. Also started ECL training from LexisNexis - Introduction to Enterprise Control Language.

Tuesday 06/07

I have continued the tutorials on ECL from LexisNexis.

In the Team meeting with Roger and Zheyu from 1130-1230, we discussed the hypothesis and the data. The following suggestions were made:

1. Include square footage in the hypothesis of the Housing dataset, as it is a function of the number of bedrooms and bathrooms.
2. I should send the updated hypothesis of both datasets.
3. I have to prioritize on ProAgrica Scheme as it may take some time to get the data.
4. Roger had cleared my doubt on the Causal Discovery of model testing.
5. I am also asked to find a way to include week numbers ranging from 1 to 52 for the COVID19 dataset so that I can keep track of which week refers to which season.
6. Roger suggested that instead of the country code, include the discretized latitude. If I can find that in the dataset, include it otherwise, I have to find the latitudes manually and add them to the dataset.

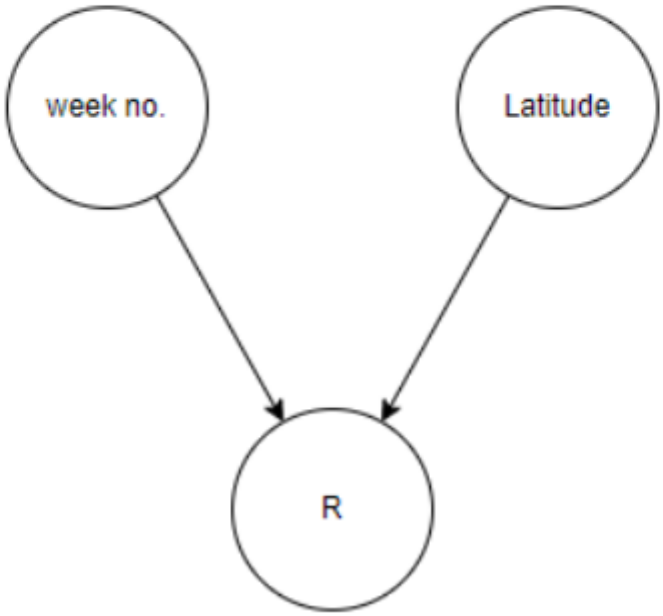
After the meeting, I updated the hypothesis](https://arungaonkar.github.io/HPCC-Causality/HypothesisProposal.pdf) for both the dataset (COVID and Housing) and sent it to Roger.

The figure below shows the sample causal model for the COVID dataset.

Hypothesis: “Geo-location and seasonality effect on COVID-19 infection rate”
Variables:

1. Week number: Obtained from the start date (Ranging from 01-52)
2. Latitude : Have to obtain based on the country location
3. R value : Infection rate, available from level1.csv

Proposed Causal models:



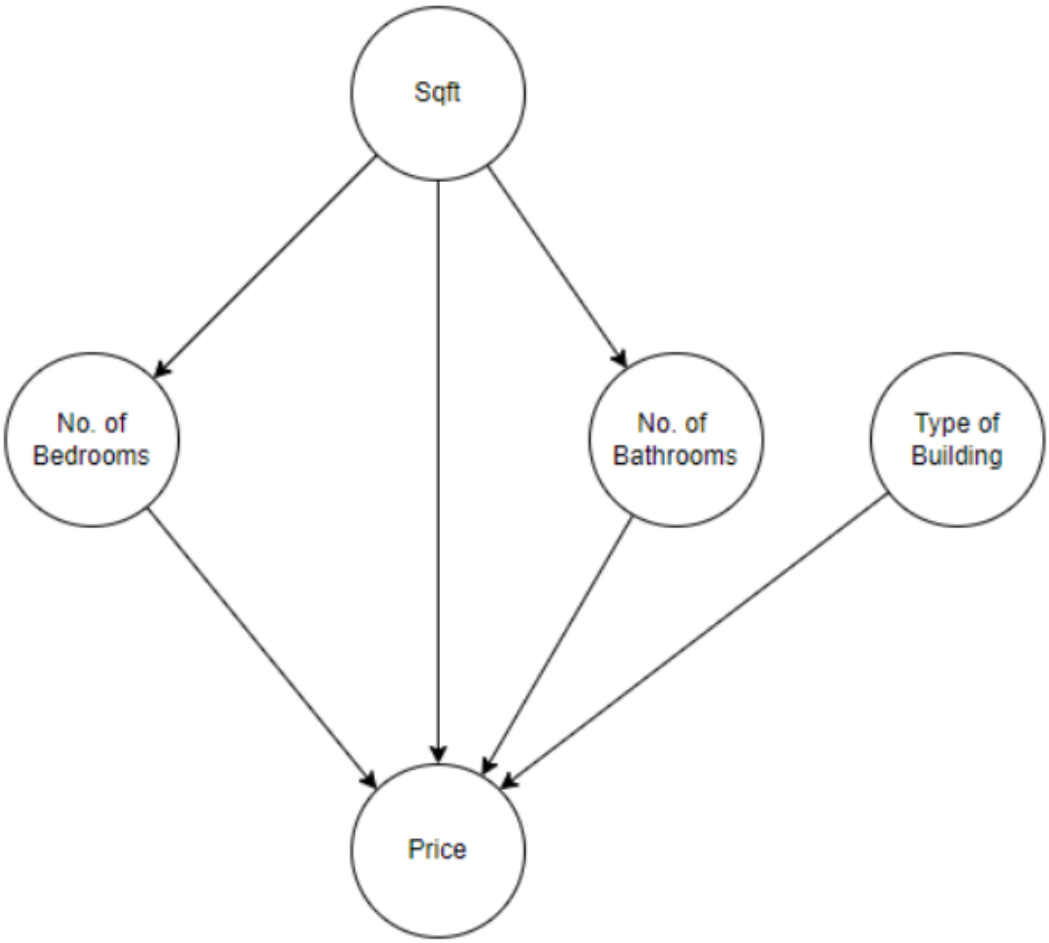
The Figure below shows the sample causal model for the Housing dataset.

Hypothesis : "Selling Price is affected by number of bedrooms, number of bathrooms, sqft of the house and also type of the house"

Variables:

1. Number of bedrooms : No. of bedrooms available in the building
2. Number of bathrooms: no. of bathrooms available in the building
3. Sqft of the house : Size of the building in sqft
4. Type of the house : Type of the building (Apartment, house, duplex, condo, loft, land etc.)
5. Price : Selling price of the house

Proposed Causal Model:

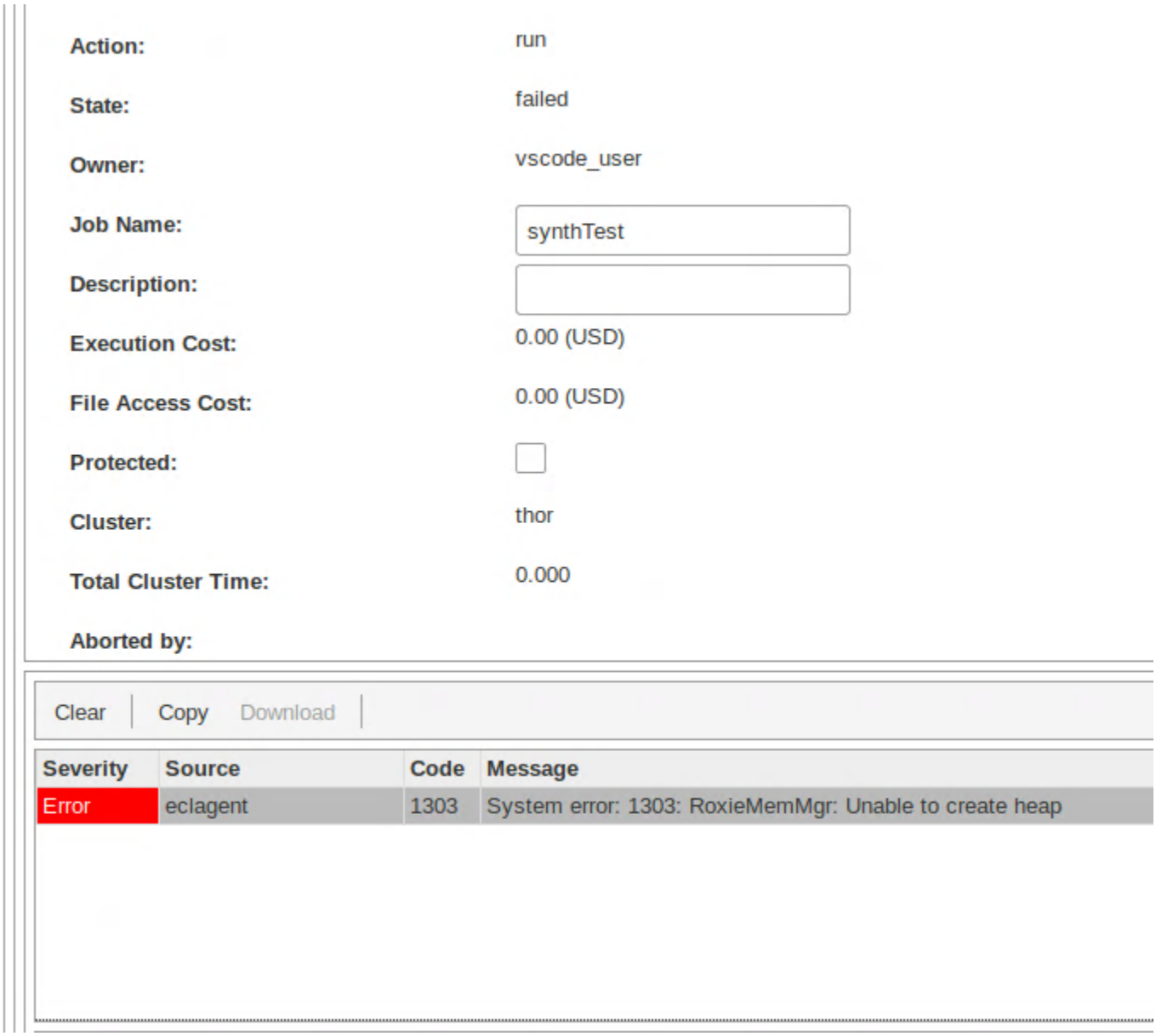


Wednesday 06/08

I have continued tutorials on ECL from LexisNexis. I started coding and was able to read the data from the dataset. Since the file size is 30 Mb, I am not able to get all the rows. The default size is 4MB, and the hard limit is 10 MB. So I should find a way to read 30 MB files.

I was facing some issues when I tried to spray the dataset files to the local cluster. When I tried running the synthTest, I got this error,

```
Code 1303,System error: 1303: RoxieMemMgr: Unable to create heap
```



Thursday 06/09

I have received ProAgrica Data and I was asked to find 3-10 variables that can be used to build a causal model and apply the toolkit to the AgX dataset.

I have also received the latitude and longitude data for countries(world.flat) and US counties(us.flat). But in the World file, there are multiple latitudes and longitude entries for the same country, having entries for multiple states. So I have got doubt about which entry to consider for the causal model.

When I tried to upload the file into my cluster, uploading was getting failed because of less disk space. I am seeing 100% usage on thor, hthor, roxie, etc. clusters. Is it because of low memory? I have downloaded the dataset on my VM, which consumed all the disk space, due to which I was not able to upload a file.

There was an event "Intern Chat" organized by Lorraine for the interns to meet each other.

1. It was a privilege to meet other interns and a few LexisNexis employees as well.
2. Getting to know what is happening at 'HPCC Systems and what other interns are working on was a great experience.

Later in the team meeting, I discussed the issues that I found with Roger.

1. For the COVID-19 dataset, with multiple values of latitude and longitude, we discussed multiple ways to get a single value latitude. Taking the first entry was not an ideal choice and so median. Hence, we have decided to use the mean of the latitude of different states of the country for an entry date.
2. Regarding uploading the files to the cluster and failing the SynthTest, Roger helped me to find the issue. It was the disk space issue. So, I tried to increase the disk size of the VM. It took around 2 hours to resolve the issue of expanding the disk. Now I have expanded the disk from 13GB to 52GB.
3. To reduce complexity in the Causal model for the housing dataset, we decided to ignore the dependency of Housing type on the number of bedrooms and bathrooms and also the square footage.

When reading the level1.csv (COVID-19 dataset) file, I decided to reach out to Hugo for additional instructions. I also wanted to ask which is the most suitable file type (flat vs csv) for playing with the data.

Friday 06/10

I began examining the AgX dataset because they (ProAgrica.com) may take some time to release the data we requested. As a result, it was deemed more important. I'm having trouble hypothesizing the data because it contains over 8000 attributes. I've compiled a list of characteristics to which I believe I can intuitively connect. However, this is taking longer than I anticipated.

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