Intro:

A tool to specify testable causal models of software behaviour is the title

Background:

Computational model are important tools for scientific research and decision making, researcher use models to simulate experiment, while decision makers use the results to make critical decision.

But according to a research in 2014, Out of the 62 primary studies, 12 studies applied at least one of these testing methods

There are two main reason:

1. Is testing problem due to the characteristics of computational model:

Some model are meant for experiment new stuff

which mean there’s often not much real-world data to compare the results to

1. Due to different trainings received by scientists and software engineer

The importance of software testing are often overlooked.

Advance methods are developed

but these advance methods require knowledge in software testing,

and are often too complicate to use,

Problem analysis

This project will mainly focus on a tool named Causcumber,

It uses Casual testing,

A testing method by change parts or input of the software and observe its execution path or output, therefore getting the behaviour of the software

To setup a test, user will need to define five files that is in setup in a specific way with a specific format

This is very demanding for user since these files not only require user to have a decent understanding of their own model, but also the format and syntax required by Causcumber

So way to simplify the testing process is need, this tool will need to

Reduce the need for user to manually code.

Some parts of file are not very straight forward, so a way to provide user assisting information is needed

Provide a guide for user on what to input in the process.

the design of the tool will be transforming the structure of the file into the user interface.

Below is one of the edit functions for a file, left is the manual version of the file, and the right is the UI

Result

The tool is used to carry out two test for two model, influenza1918 and covasim,

The tool reduce the need for user to manually code and provide guide in the process

User won’t require to learn the syntax and deal with format of the file

The auto generated files also reduce user’s workload

Conclusion

Test computational model is an important step of development, but is often ignored.

Advance method such as Causcumber is useful, but are often too complicated for untrained user.

An assist tool is implemented, provide assist during the editing process.

With the help of assisting tool, easier to encourage more user to use Causcumber.