

# Assignment 2 - Reactive Systems

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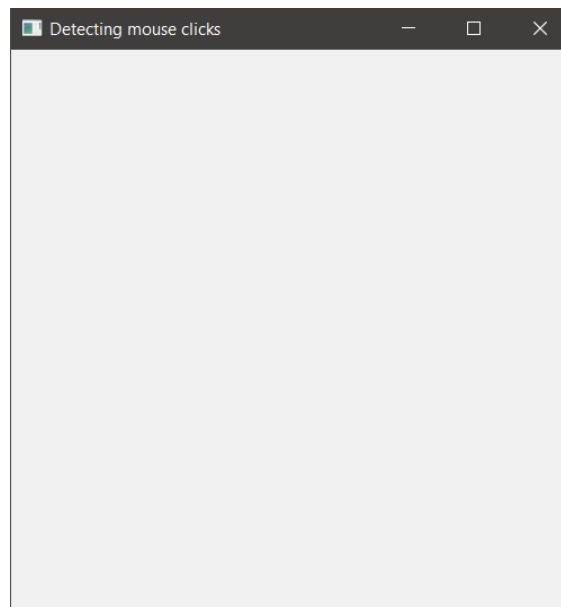
## Approach

I have used the PyQt library to create a GUI window which acts as our testing window. All the clicks in this window are registered and a rx.subject records them. An observer subscribed to this subject triggers a function responsible for printing the appropriate output.

## How it works

### Creating a GUI

I have used the PyQt library to create a GUI window. A Window class contains all the specifications and methods pertaining to the window created. This includes the window title, size and mouse click detection (more details below). In the main function, we create an instance of this class and show this window.



### Detecting mouse clicks

To detect mouse clicks inside the GUI window, we have a function called *mousePressEvent*. This function is a PyQt function that listens to mouse presses. When there is a mouse click, this function changes the state of the subject *mouseclick*. This is a RX Subject which is used to record clicks and our observer is subscribed to this Subject. Basically, this subject acts as a bridge between PyQt mouse click detector and rx observers.

## Observer function (printing output)

I have defined a period of 500 milliseconds or 0.5 seconds (since this seems to be the case in general) for two consecutive clicks to be considered a double click. An observer is subscribed to the subject *mouseclick* and it triggers the function *on\_next* which prints the output. To implement the double click detection, we need to have a buffer. An observable has a method called *buffer\_with\_time* which helps maintain a buffer of events in a period but this method is not available for a Subject (would have made things a lot easier for me). Therefore, I had to maintain a buffer using an array. This buffer stores the time of the events and checks for differences in the time of previous and current events to determine whether it is a double click or a single click. Also, if there are more than two clicks in 0.5 seconds, it will still consider it as a double click.

```
Click anywhere on the window opened to test the program
Left click
Left Double click
Left Double click
Left click
```

## Testing

### Requirements

Make sure to install the below before testing the program -

- Python 3.8
- RxPY
- PyQt5

### How to run

Just run the program using python -

```
python mouse.py
```

## References

- <https://github.com/ReactiveX/RxPY>
- <https://rxpy.readthedocs.io/en/latest/index.html>
- <https://stackoverflow.com/>
- <https://www.youtube.com/watch?v=1pD5he10Eo0>