# Programming challenge

In psychology, there is a famous effect called the stroop effect: when a word representing a colour is presented with a different colour (for example **RED** or **ORANGE** or **YELLOW**), we are slower at reporting the meaning or physically presented colour than if the colour and meaning is the same (**RED** or **ORANGE** or **YELLOW**). This effect changes our reaction time (RT) - the time between when we see a picture and we decide what it is.

Using either Python or MATLAB, create a small program to test the stroop effect. A subject is presented with a word in a window, and the subject must respond as quickly as possible what the colour is by pressing a series of buttons. For example, the word **RED** is shown and a set of coloured buttons are presented (or you can use keyboard responses, so 1=red, 2=orange, 3=yellow etc.) and the subject must answer as quickly as possible.

Figure 1: In this trial, the subject must report the meaning of the word, not the colour, and so [1] is the correct answer. The subject will take longer when the meaning and colour are different.

You must record the name and data about the subject at the start, and for each repeated presentation save the presented word (colour/meaning) and the reaction time and whether the subject answer was correct. You must mix repeated trials where the name and colour are the same and those that are different.

Though not essential, you will get **extra** points if you use object-oriented design [1], and for data storage use dictionaries (Python), or data tables/categorical arrays [2] in MATLAB. In Python you may need to use tkinter or another GUI toolkit to display the image to the subject. You will also get **extra** points if you plot the results after the subject has finished the test (using something like matplotlib in Python). You will also get **extra** points if you upload the code using CVS like ***git*** to Github or Gitlab [3].

[1] <https://realpython.com/python3-object-oriented-programming/> & <https://uk.mathworks.com/help/matlab/object-oriented-programming.html>

[2] <https://uk.mathworks.com/help/matlab/tables.html>

[3] <https://github.com> & <https://about.gitlab.com>