Procedure

PRIOR PREPARATION

- Open each activity in the corresponding applications. For example, opening the videos and games in separate tabs of Firefox, opening the PDFs for reading and searching in a suitable PDF reader, opening the programming activities in Visual Studio
- For the programming activities, make a separate copy of the programming activity folder, so that any changes made by the participant don't override the master copy.
- Start the data collection program.
- Set the save location and participant number in the data collection program.

SETTING UP

- Give participants the plain language statement and consent form, acquire consent.
- Place the participants in front of the computer asking them to sit where they are comfortable.
- Read script for SETTING UP
- Calibrate the Tobii Eye Tracker for the participant. Adjusting the seat height/distance from the computer until tracking is ideal.

READ ACTIVITY

- Read the script for the READ activity.
- Bring the PDF application with the text for reading to the foreground.
- Bring the data collection program to the foreground. In the data collection program, start the collection for READ.
- Minimise the data collection program so the participant can begin reading.
- Start 5 minute timer
- Once 5 minutes has elapsed or the participant has finished the list, stop the data collection program. The file should save automatically.

WATCH ACTIVITY

- Read the script for the WATCH activity.
- Bring the tab with the video to the foreground.
- Bring the data collection program to the foreground. In the data collection program, start the collection for WATCH.
- Minimise the data collection program so the participant can begin watching.
- Maximise the video to take up the entire screen.
- Once the video has finished, stop the data collection program, the file should save automatically.

SEARCH ACTIVITY

- Read the script for the SEARCH activity.
- Open a clean browser for the participant to search in.
- Open the PDF file with the questions the participant should find.
- Make both the browser and PDF file fullscreen and let the participant alt-tab between them.
- Bring the data collection program to the foreground. In the data collection program, start the collection for SEARCH.
- Minimise the data collection program so the participant can begin searching.
- Start 5 minute timer
- Once 5 minutes has elapsed or the participant has finished the list, stop the data collection program. The file should save automatically.

GAME ACTIVITY

- Read the script for the GAME activity
- Bring the tab with the game to the foreground.
- Bring the data collection program to the foreground. In the data collection program, start the collection for GAME.
- Minimise the data collection program so the participant can begin playing the game.
- Start 5 minute timer
- Once 5 minutes has elapsed, stop the data collection program. The file should save automatically.

READING CODE ACTIVITY

- Read the script for the READING CODE activity.
- Bring visual studio to the foreground. In visual studio, select the 'DetermineOutput' project from the project dropdown.
- Open "DetermineOutput.cs" which is under the DetermineOutput project.
- Make visual studio fullscreen.
- Bring the data collection program to the foreground. In the data collection program, start the collection for READING CODE.
- Minimise the data collection program so the participant can begin reading the code.
- Start 5 minute timer
- Once 5 minutes has elapsed, stop the data collection program. The file should save automatically.

WRITING CODE ACTIVITY

- Read the script for the WRITING CODE activity.
- Bring visual studio to the foreground. In visual studio, select the 'WriteAlgorithm' project from the project dropdown.
- Open 'EntryPoint.cs' which is under the WriteAlgorithm project. Explain that each question has its own file for implementation. (Under the same project).
- Click run to make sure it compiles.
- Make visual studio fullscreen.

- Bring the data collection program to the foreground. In the data collection program, start the collection for WRITING CODE.
- Minimise the data collection program so the participant can begin writing code.
- Start 5 minute timer
- Once 5 minutes has elapsed, stop the data collection program. The file should save automatically.

DEBUGGING CODE ACTIVITY

- Read the script for the DEBUGGING CODE activity.
- Bring visual studio to the foreground. In visual studio, select the 'Debugging' project from the project dropdown.
- Open 'Debug.cs' file which is under the Debugging project
- Make visual studio fullscreen.
- Bring the data collection program to the foreground. In the data collection program, start the collection for DEBUGGING CODE.
- Minimise the data collection program so the participant can begin reading the code.
- Start 5 minute timer
- Once 5 minutes has elapsed, stop the data collection program. The file should save automatically.

FINISHING UP

- Debrief participant
- Present participant with survey
- See participant out
- Move generated data files somewhere for safekeeping
- Close all activities

Script

SETTING UP

Thank you for taking the time to participate in the study. It will take around 30-40 minutes to complete. For this study, you will undertake several activities for 5 minutes each. Once the time limit has been reached you will be stopped.

As you undertake these activities, we will use this eye tracker to record where you are looking. This is to help us to identify repeated patterns in the eye movements and how these can be used to recognise different kinds of activities.

If you have questions at any point, please feel free to ask. Do you have any questions so far?

First, we will calibrate the eye tracker. *[Perform calibration procedure]*

READ ACTIVITY

In the first activity, you are required to simply read a short passage of text. This should take approximately 5 minutes depending on your reading speed. Feel free to take your time reading and take everything in. Speed does not matter here. You will be stopped after 5 minutes has elapsed. If you finish before that time, please let me know. You may navigate between pages using the arrow keys. Do you have any questions?

WATCH ACTIVITY

For this activity, you are required to watch a short video. The video is approximately 5 minutes long and requires you to watch it from start to finish. Do you have any questions?

SEARCH ACTIVITY

For this activity, you are required to find the answers to a list of questions we provide you. You can use google to find the answers to these questions. For each question, once you feel you have found the correct answer, you are free to move on to the next question. You are able to alt+tab between the questions and the browser, however, copy/pasting the questions verbatim should be avoided. You will be stopped after 5 minutes has elapsed. Speed does not matter here. You are free to search at your own pace. Do you have any questions?

GAME ACTIVITY

For this activity, you are required to play a simple game. *[Explain controls depending on which game has been chosen].* If you lose the game, simply restart and continue playing. You will be stopped after 5 minutes has elapsed. Do you have any questions?

READING CODE ACTIVITY

We will now switch to the programming activities. You will perform 3 types of programming activities.

The first programming activity requires you to read and determine the output of 3 short functions. You will see a file with 3 questions. *[Show the file]* Each question requires you to determine what will be printed to the console if you were to call that function. The functions are deliberately convoluted. Once you think you have figured out the answer, you are free to move on to the next question. Speed does not matter. Even though getting the correct answer is not the point of this activity, ensure you are thorough when determining the output. You will be stopped after 5 minutes has elapsed. Do you have any questions?

WRITING CODE ACTIVITY

The second programming tasks requires you to implement 3 different functions. A description of what each function must do is given to you in the main file. Each function will be implemented in a separate file *[Indicate where these files are in Visual Studio].* You are free to implement these functions in any way you see fit. You can test your functions by uncommenting where indicated then clicking Run at the top of Visual Studio. The output will be printed to the console. *[Show how to do this/show where these buttons are.]* It is not expected that you will complete all the questions in the time limit. You will be stopped after 5 minutes has elapsed. Do you have any questions?

DEBUGGING CODE ACTIVITY

For the final programming task you are required to debug a small piece of code that has had multiple bugs placed throughout the code. *[Show the file]* The explanation of the code is given at the top of the file, along with the ***expected output***. You can test as you go by clicking the run button at the top of Visual Studio and checking the output in the console. You are free to change the code in any way you see fit. You will be stopped after 5 minutes. Do you have any questions?