Affective Computing
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Week - 03
Lecture - 09
Experimental Design: Affect Elicitation Research and development Tools

Hi friends welcome to today's module. In the last lecture we have already learnt about the experimental methodologies in which we learn about different sensors. In today's class we will be exploring PsychoPy and how to use these sensors. So, PsychoPy is an open-source Python tool which is widely accepted to create experiments in neuroscience and experimental psychology research.

PsychoPy provides a graphical user interface for designing various psychological experiments without any programming. So, PsychoPy has three main building blocks for constructing experiment which include the stimulus component, the routines and the loops. Stimulus components are the pre made custom templates which for displaying various types of stimuli like geometric shapes, videos, pictures, audio signals.

Then the user can control which stimuli they want to present in what order and for how long. Similarly, response components allows to record different types of responses like keypress, mouse, clicks, vocal responses, facial data, etcetera. Stimulus and response components are organized within routines which are a sequence of events within one experimental trial. So, PsychoPy provides us an option to include custom Python code which can be embedded in the beginning or end of the experiment.

Text can be added in different routines as stimuli by adding text, pictures, item, keyboard, mouse and other sensors. So, we will be looking how to integrate them in the further video. Also, PsychoPy uses Python programming language as a in the background and we can use custom Python code items to add different features which are not available in PsychoPy. Routines and loop can be added for repeating one or several routines including the stimuli, the user response, the sending of the recording of facial data, etcetera.

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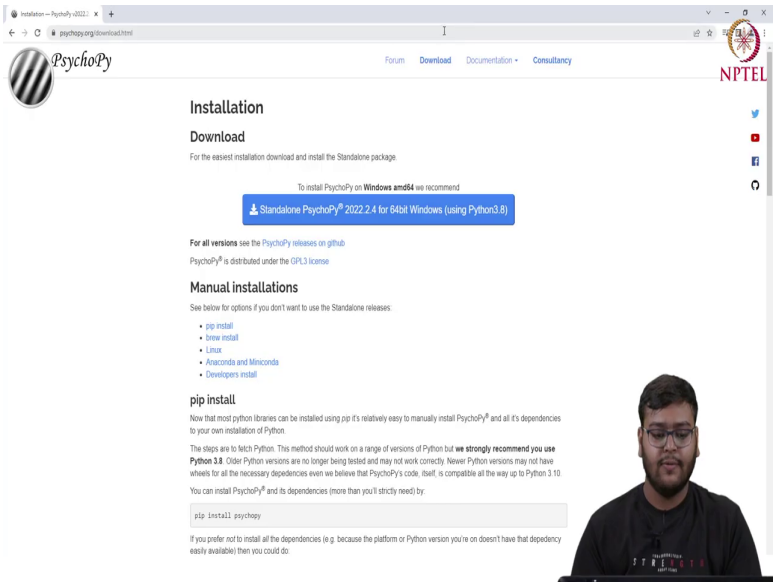

So, for installing the PsychoPy please visit the official website which is www dot PsychoPy dot org slash download dot html.

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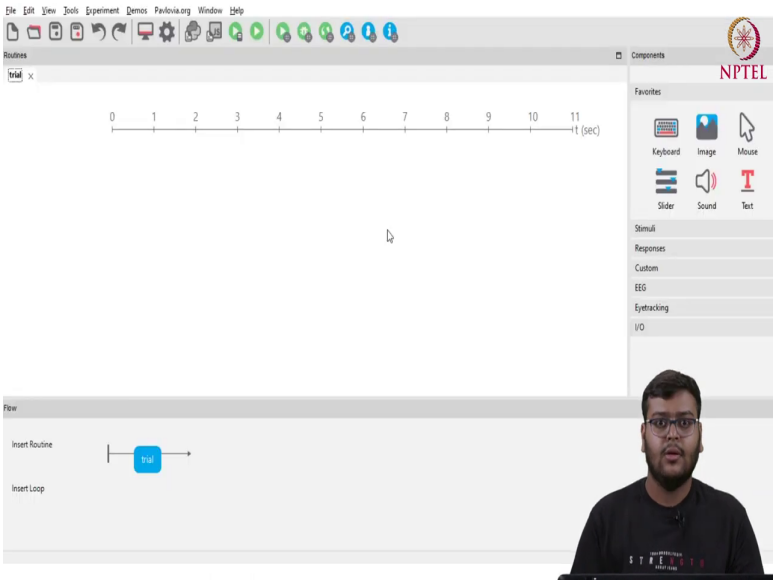

So, after downloading the PsychoPy, now opening the PsychoPy builder. So, after opening we will be shown this timeline where we have a initial trial a trial routine which is created by default. So, we will be creating a pretrial routine.

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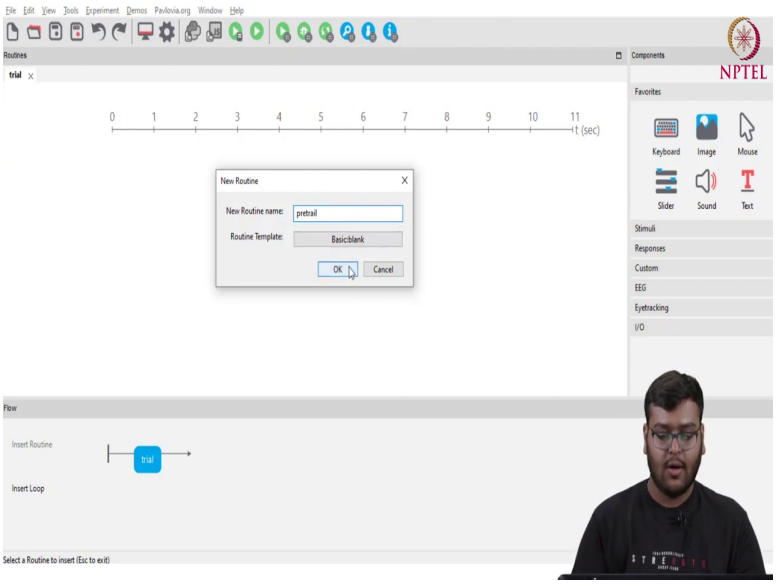

So, for that in click on the insert routine button and adding a pretrial. So, on clicking.

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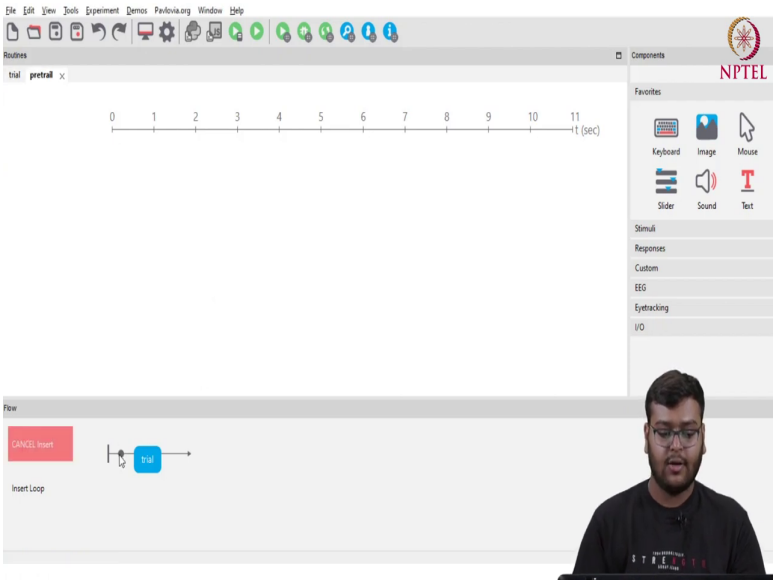

We get an option to install pretrial before and after the trial. So, here we want to install that before the trial added that pretrial before the actual experiment. So, here we can see now we have two videos for trial and pretrial.

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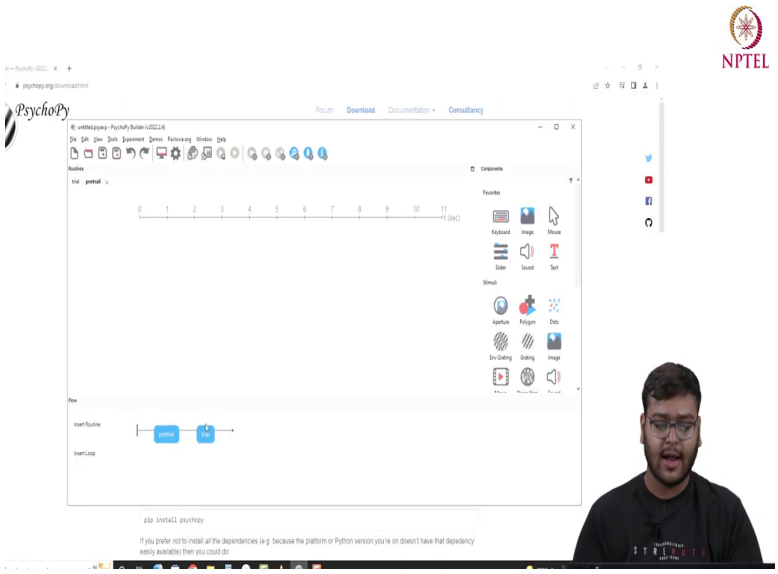

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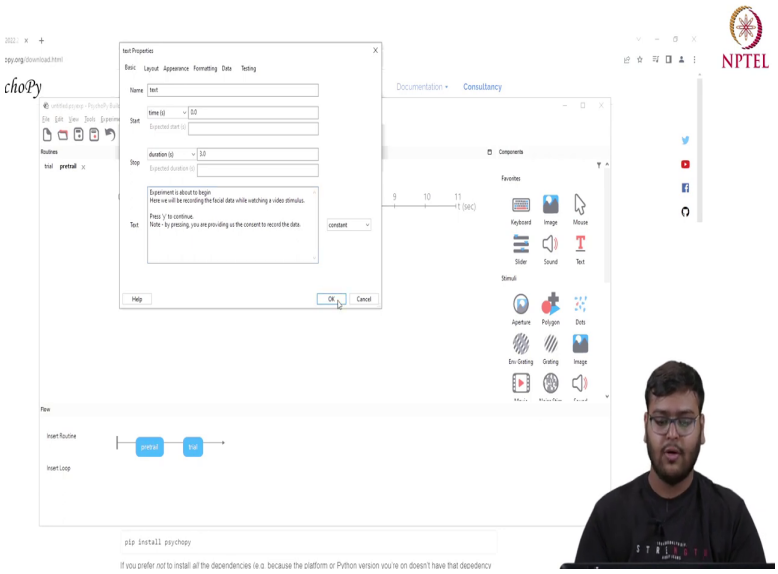

So, for the pretrial now we will be adding a text component. So, we will name it as a text this is a variable name. Now, we will be telling the starting time and the stopping time. So, here we wants like it should continue till 3 seconds and here we can add the custom text that we want. So, let us say we add Experiment is about to begin. Press here we will be recording the facial data while watching a video stimulus. Press Y to continue.

So, for recording the experiment we should always take the consent of the participant who is actually giving his data. So, here we will be providing the consent option as well. So, by pressing you are providing as the consent to record the data.

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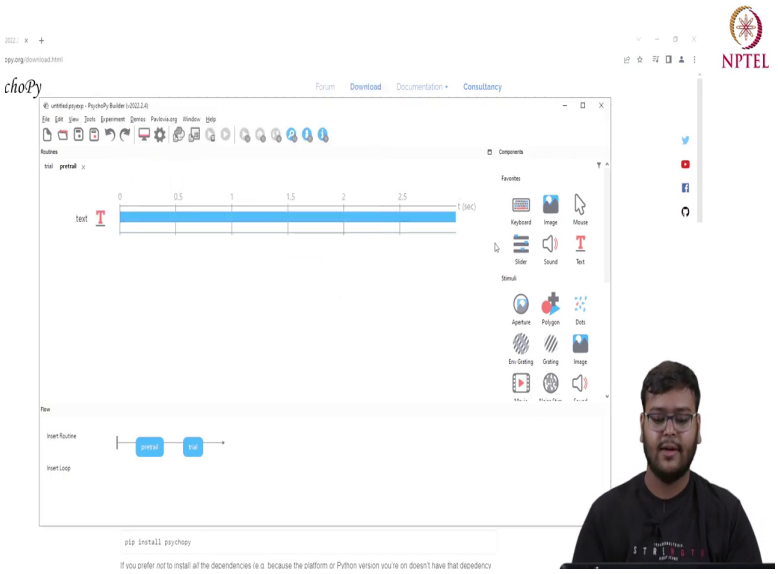

So, now, we have added the text and also.

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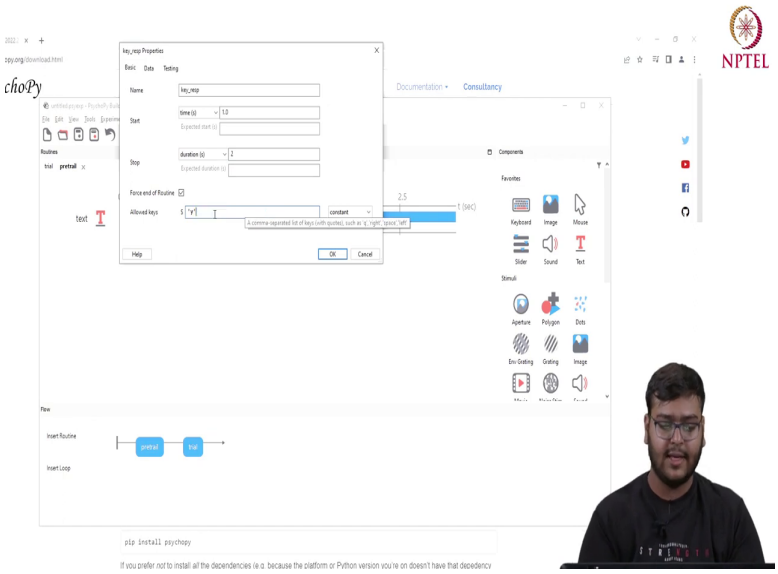

Like we have actually asked the students to press the Y key.

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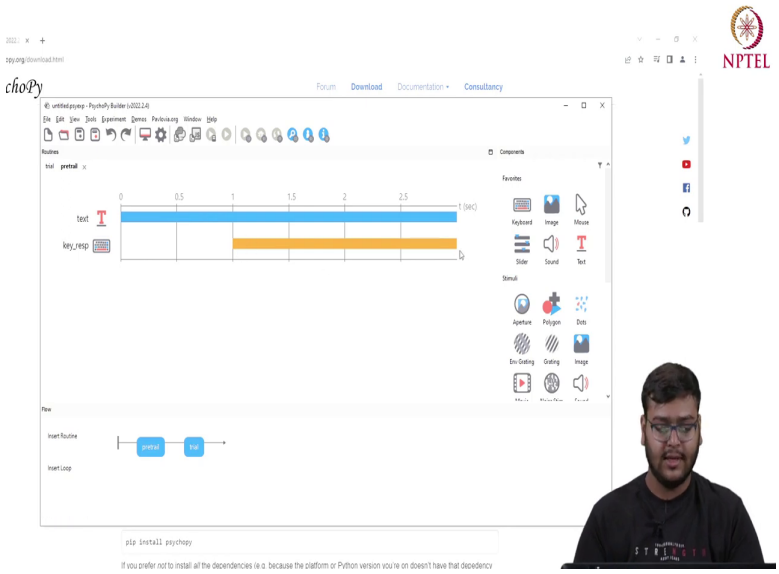

So, here we will add a key response and here we want it to start at time t equals to 1 second and for a duration of 2 seconds. So, and we want it to press the Y key. So, now we can see here like we have created a 3 second pretrial where a text will be displayed and a key response will be taken from the 1 second to 3 second.

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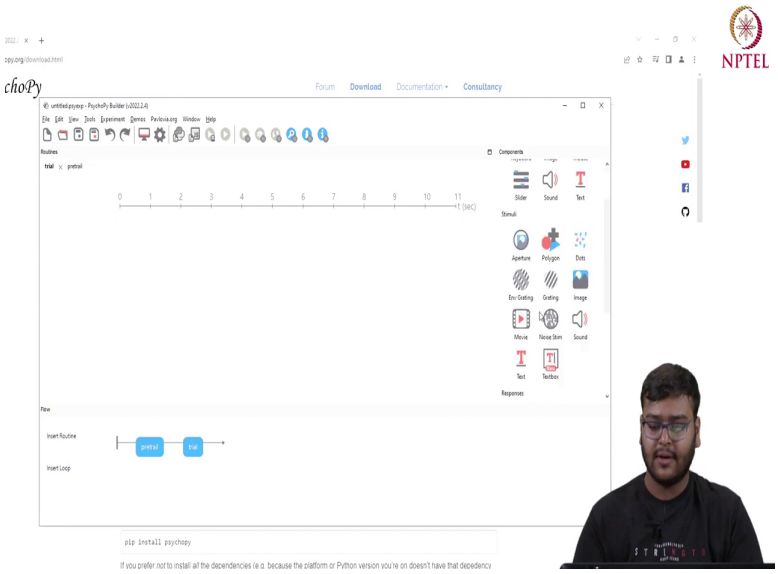

Now going on to the trial section. So, here we want to add a video response a video stimuli to the participant.

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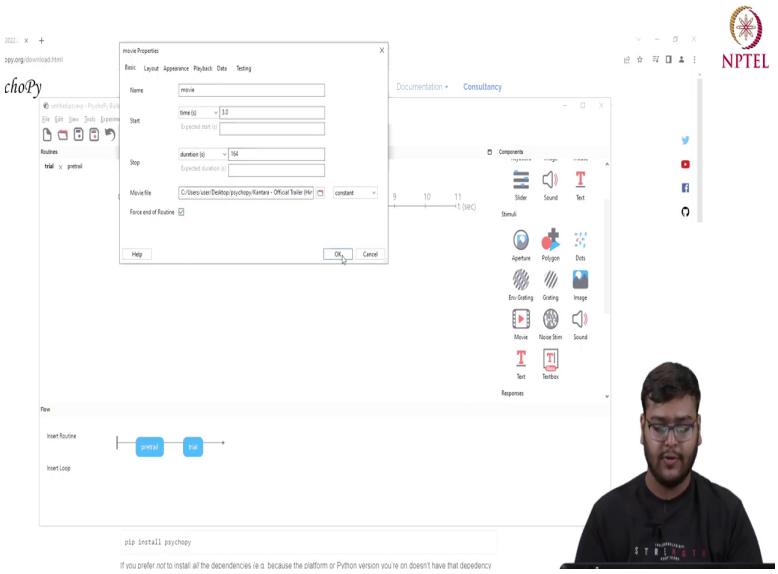

So, here we will click on the video option and let us name this variable as movie and we want it to start after the pretrial is completed. So, here we will have we will start it from the 3 seconds also like we want to watch the whole video. So, whole video is around 2 minutes 44 seconds. So, it will be around 164 seconds. So, it will start from time 3 equals to 3.

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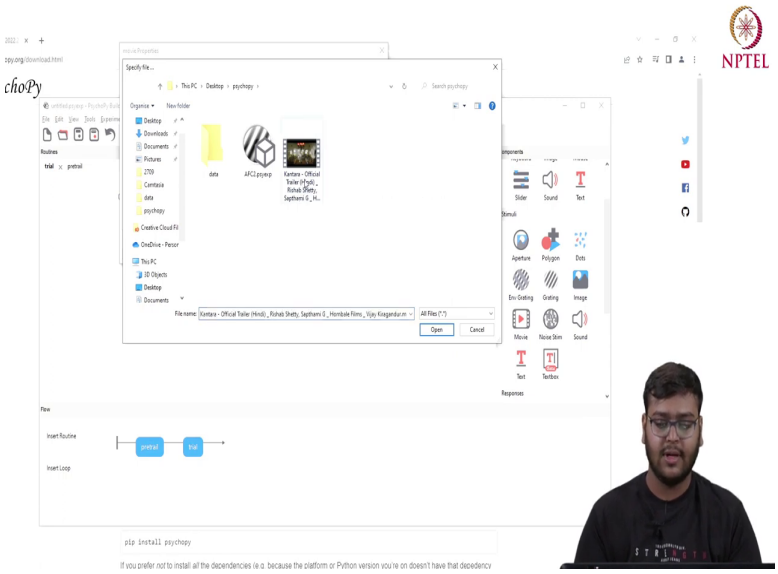

And now we will need to provide the path of the video. So, here we will be adding the path of the video and we want to end this routine after the completion of the video.

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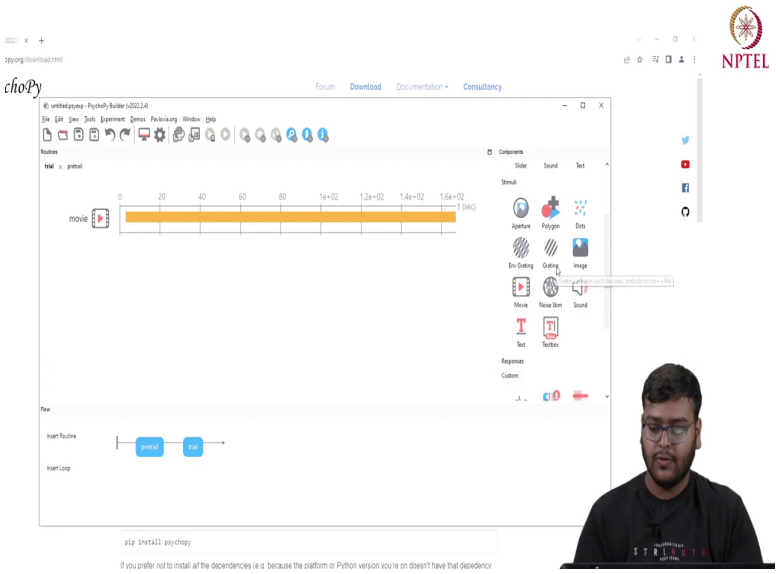

So, now, here we can see from time t equals to 3 the movie stimulus has been added and also, we want to add a camera option. So, for the camera option.

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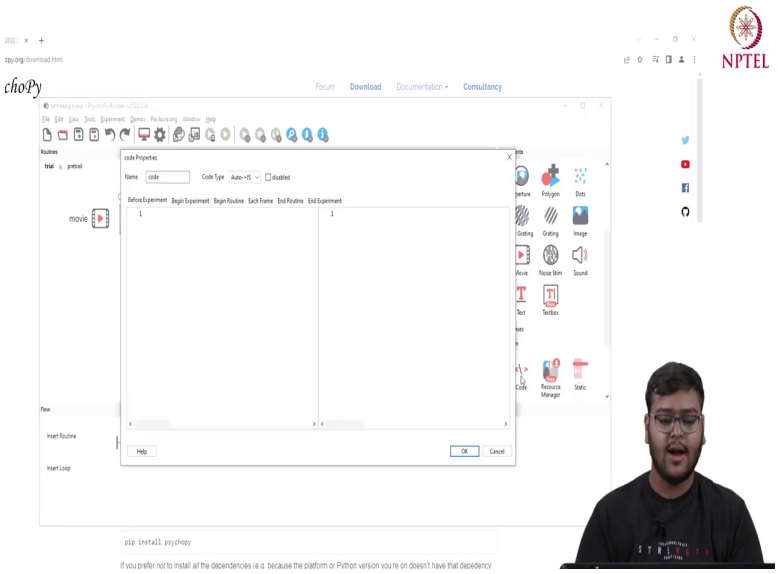

We will be using the custom code component and we will be writing the code.

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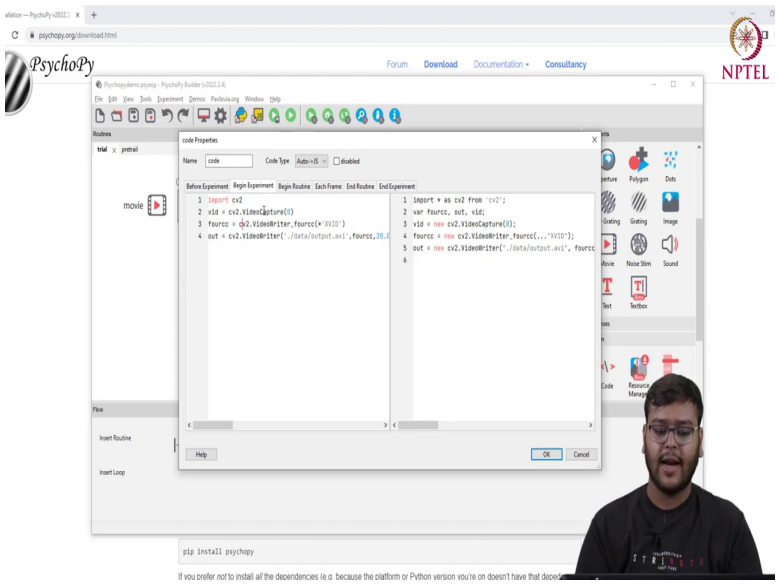

So, in the we want that code to be begin in the begin of the experiment. So, we will be adding the demo code. So, for code we will be importing a cv2 and we will be saving we will be getting the video capture for the camera that we have actually added external camera that we have added. So, after that we will be adding a fork to write the video and we will be saving the video in the data folder.

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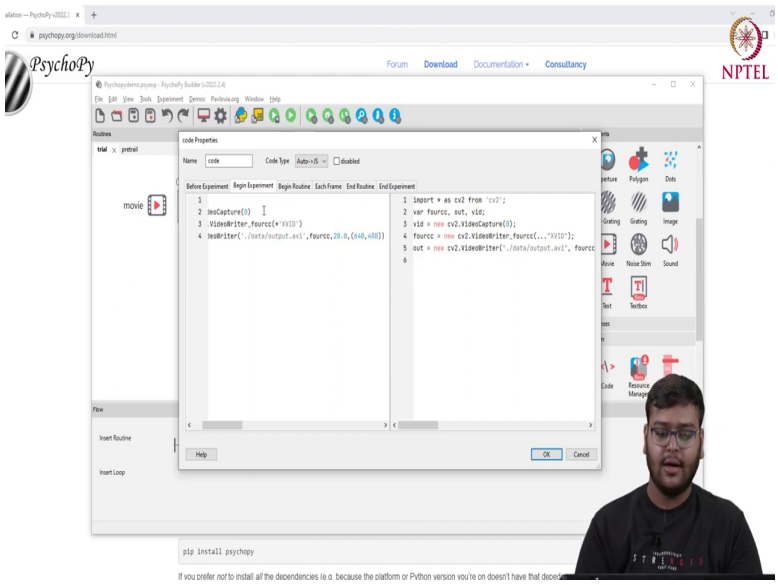

And we will be at providing the custom window frame size that is 640 cross 480.

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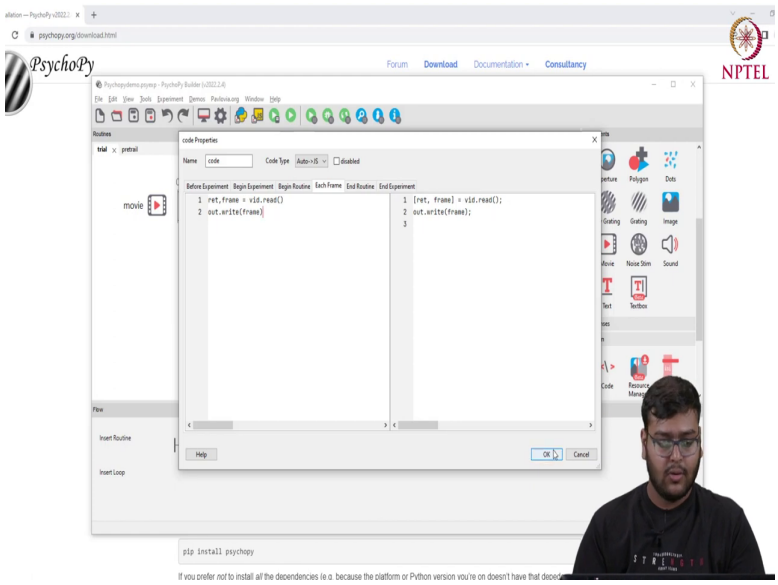

Also, for each frame we want to save the get the video frame and save it in the output file. So, for that we will be using ret and we return in frame to actually read the video that is there and we want to write that frame. So, we will be writing that frame in the output file.

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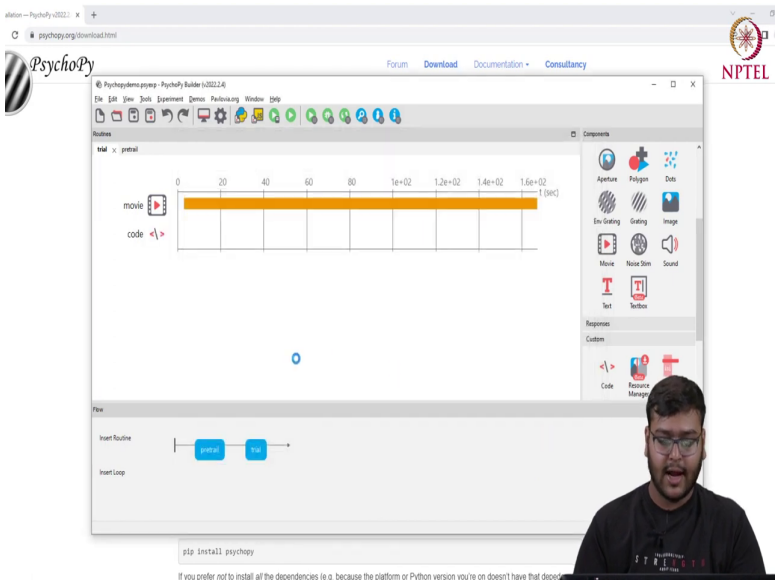

So, now, our code for that is complete.

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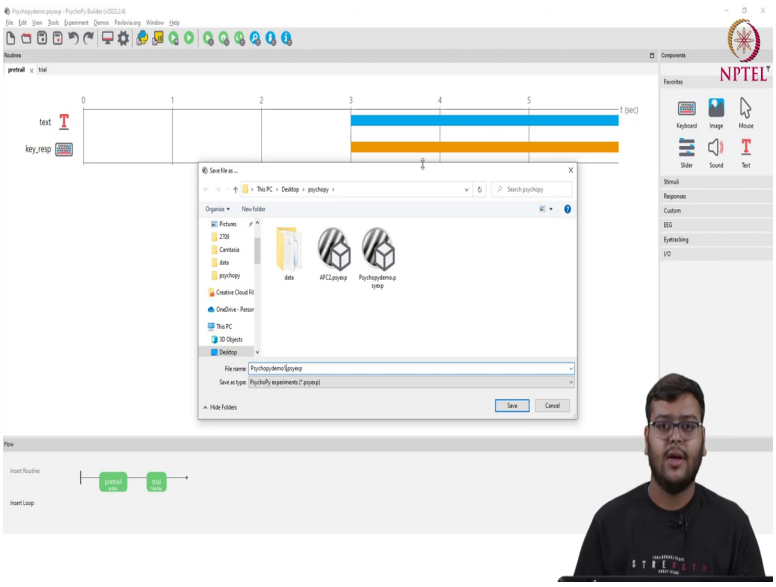

So, now, clicking on the File option and save as. So, here we will be saving the PsychoPy experiment that we have generated.

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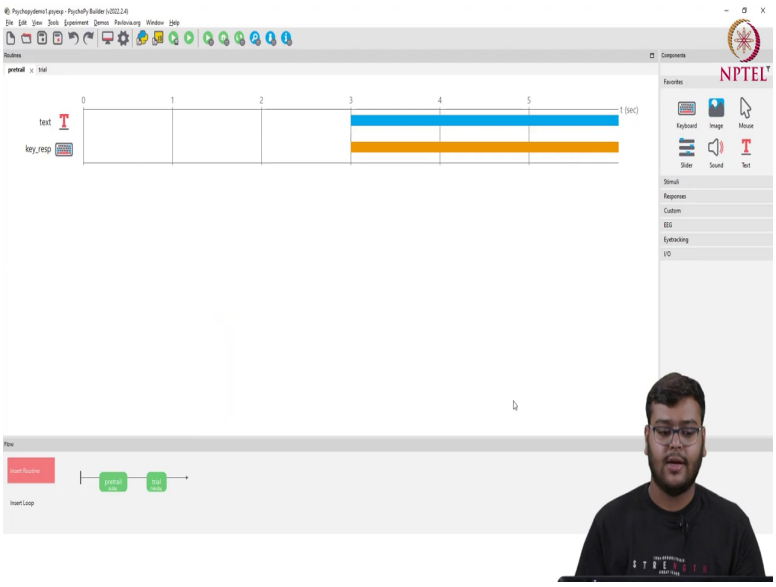

So, here the PsychoPy experiment has been saved successfully.

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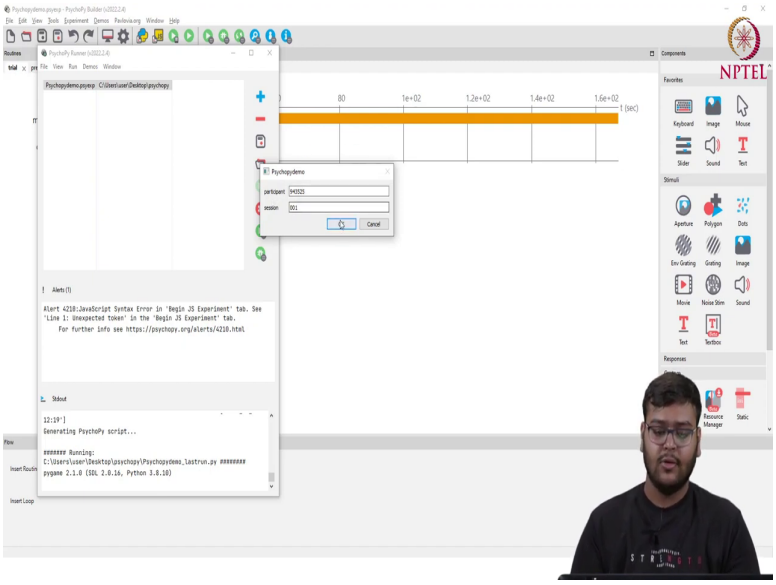

Now starting with the experiment and while playing it we will record it will show me the stimulus and the facial cameras will record my expression while watching the video. I am starting with the experiment. So, by clicking play option it will start the experiment and I will be open up with this dialogue box which will be asking for the participant ID and the session.

So, by clicking OK it will start with the experiment and this PsychoPy has started. So, initially we will be shown with the pretrial screen and then with the routine.

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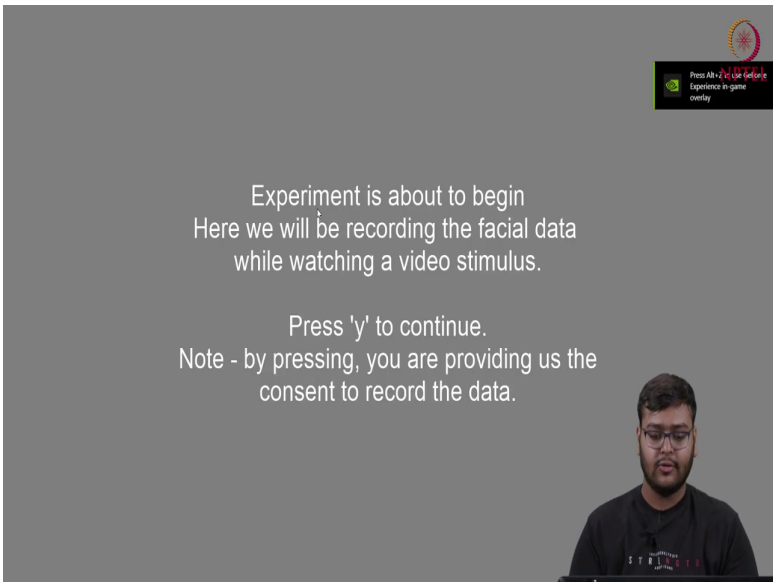

So, here the pretrial routine is there and by pressing Y we are starting with the actual experiment.

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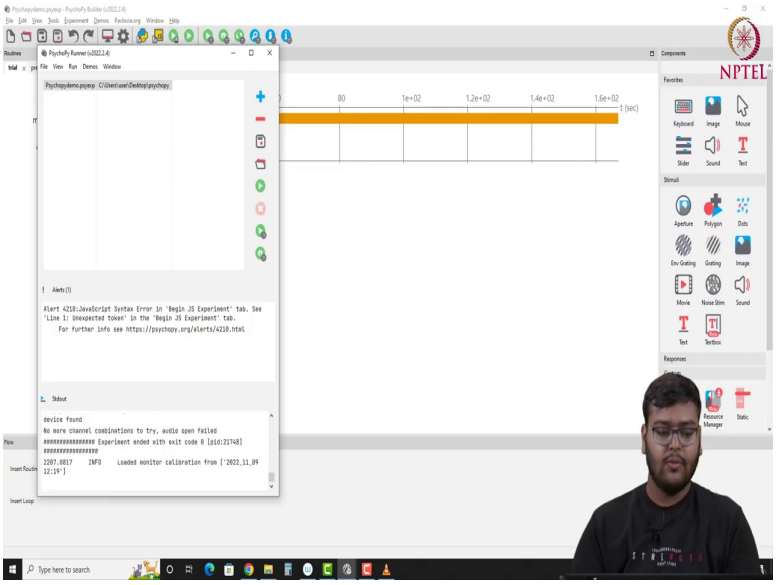

So, now with the experiment has been completed successfully and we can see the data has been saved. So, going to the data directory.

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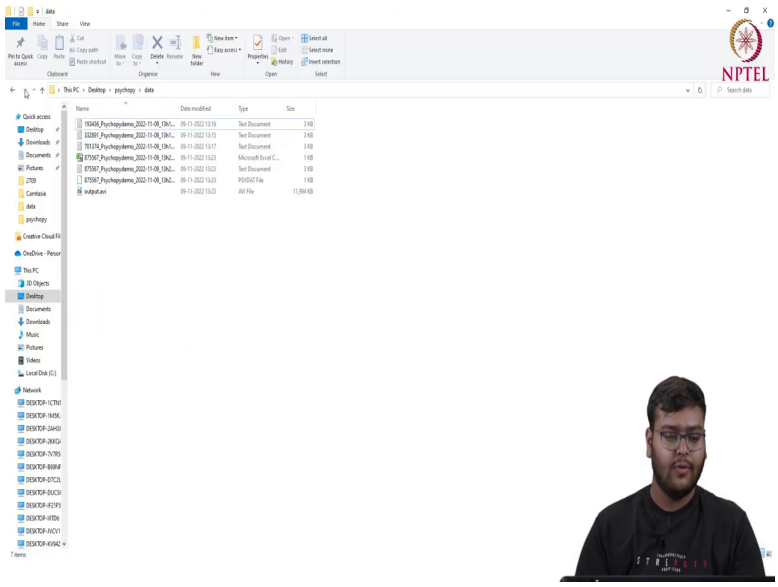

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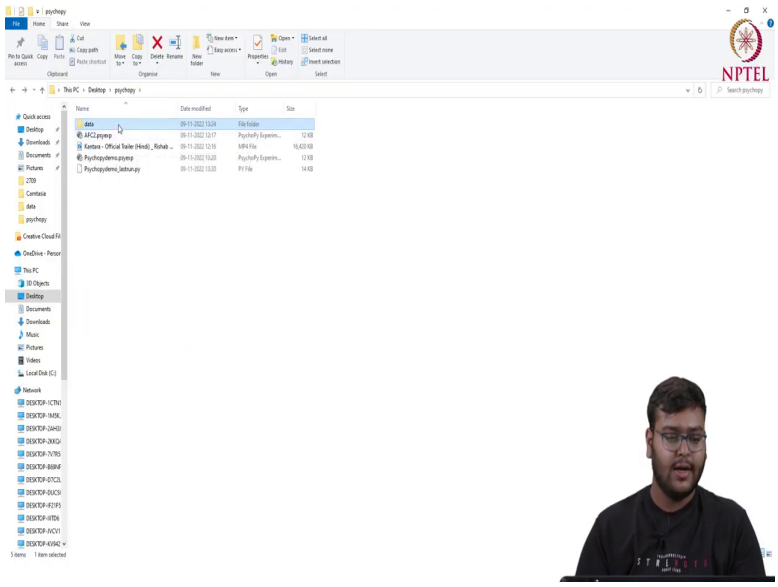

So, we can see in the data directory.

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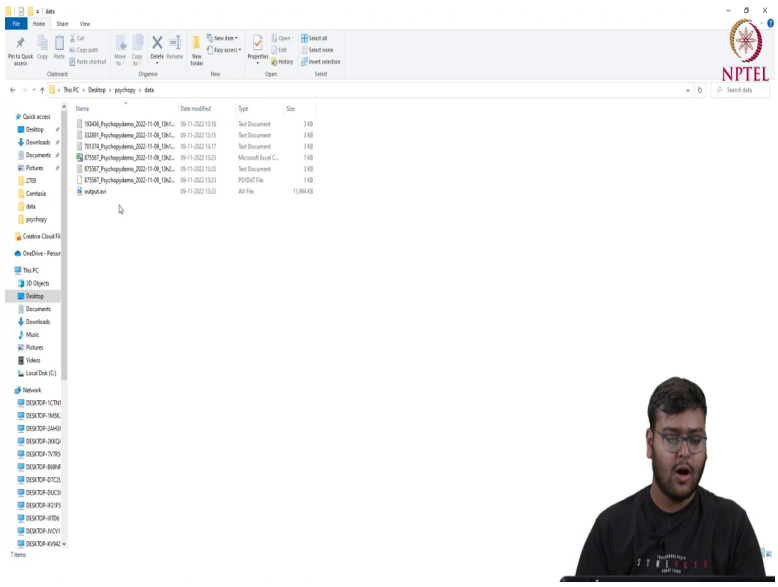

There is an output file of the camera recording that has been generated. So, if we will open that. So, here we can see the camp that has generated and if we will look at the video. So, here we can see like the video and the camera expressions that are there. So, while watching the video we are actually getting the facial camera experiment and it has saved the data for around with the same time period that we have generated.

In this lecture we have seen how to create an experiment while using PsychoPy and we have seen a demo experiment that we have generated and the data that has been generated while watching a video stimulus and after that the data has been recorded. This data can be used by the researchers for their future research.

Thank you.