

EXPERIMENTER:

- Prepare all computers by logging in, starting OpenSesame, opening the experiment and entering a unique participant id.
- Place the Consent Form and the 4 legend sheets in front of every computer.
- Invite the participants in the lab, ask them to sit down and not use the computers for now.
- Ask participants to remove any possible distractions
 - mobile phones
- Check requirements:
 - 1 year Java experience
 - Not color-blind
- Read the following introduction:

Hello everyone and welcome to our research experiment on source code comprehension. Thank you for participating in our research. Before we proceed, you should read and sign the consent form in front of you.

EXPERIMENTER:

- Collect the signed consent forms. Make sure the forms are signed.

The goal of the experiment is to evaluate three different programming tools on how they help developers answer simple questions about the structure of Java methods. In this experiment we will use screen shots from the Eclipse IDE and also from two variants of Envision – a visual code editor that we are currently designing. The difference between the the three tools is how they render methods.

To be able to answer questions about the Envision screen shots, it is important to understand the Envision visualizations and how they correspond to programming constructs. We will discuss the visualizations in a moment. To help you remember what Envision's visualizations represent, we have provided you with four sheets that serve as a legend. The sheets in front of you contain an Eclipse screen shot of a method and the equivalent method visualized in Envision using two different visualization settings. The three are completely equivalent. The fourth sheet is a summary of the most important differences between the visualizations. You can use these sheets throughout the entire experiment. You don't need to memorize everything now as you can look it up later.

Now let's look at Envision's visualizations in more detail. In general, Envision uses more visual variety when rendering methods, such as coloring some statements with a specific background, using icons instead of keywords, or using outlines instead of curly braces. The idea is that using more visual elements, instead of just text, will help developers to more quickly understand code fragments. Let me illustrate some of these differences:

- **[Show the slides, and talk about some of the more important differences from the differences sheet]**

In this study you will not need to create these visualizations, but just understand them. Take a moment now to look at the legend sheets and ask questions.

EXPERIMENTER:

- Answer questions pertaining to the legend sheets.
- Read:

Now, please turn to the computers and start following the instructions there for a brief tutorial. After you finish the tutorial you can ask questions if anything is unclear.

PARTICIPANTS:

- Do the introductory tutorial.
- Ask questions about the experimental procedure.
- Wait until there are no more questions.

EXPERIMENTER:

- Answer questions the participants might have now.
- Read:

*If you have any other questions, please ask now. During the experiment I will not answer any questions. If something is unclear, just answer as best as you can. If you realize that you have misunderstood a question or made a mistake, just move on, and answer the remaining questions as best as you can. **Important:** Please do NOT press the ESCAPE key, as it will exit the experiment. You may start the experiment now by pressing SPACE.*

- Remain quiet until the end of the experiment (all participants have finished).

PARTICIPANTS:

- Answer all experimental questions.
- Close OpenSesame.
- Return the legend sheets.
- Leave the lab.

EXPERIMENTER:

- Thanks participants.
- Collects all produced data files.
- Uploads it to SVN immediately.
- Logs out from all computers.