

# CPSC 444 Tutorial: Experiments 1

## Required Preparation:

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- One team member needs to bring an additional laptop
- Obtain a mouse from the TA to use with the additional laptop
- The Keyboard Experiment application is used in this tutorial:
  - **On the extra laptop:** Download and unzip the Keyboard Experiment (no installation required)
    - Windows: [http://www.cs.ubc.ca/~cs444/tutorials/Exptl\\_KeyboardExperiment\\_Windows.zip](http://www.cs.ubc.ca/~cs444/tutorials/Exptl_KeyboardExperiment_Windows.zip)
    - Mac: [http://www.cs.ubc.ca/~cs444/tutorials/Exptl\\_KeyboardExperiment\\_Mac.zip](http://www.cs.ubc.ca/~cs444/tutorials/Exptl_KeyboardExperiment_Mac.zip)
    - If you cannot run one of these versions on your laptop follow the installation instructions below to install Tcl/Tk and run KeyboardExperiment.tcl from your laptop.
  - **On the lab machines:** Download [http://www.cs.ubc.ca/~cs444/tutorials/Exptl\\_KeyboardExperiment.tcl](http://www.cs.ubc.ca/~cs444/tutorials/Exptl_KeyboardExperiment.tcl) (Do not use the stand alone version)
  - Double-click the icon to launch the application (it may take a second)
  - The ExperimentLog.txt logfile location varies depending on your OS and version. On a personal computer it should appear either in the same directory or 'Users/[UserName]', and on the lab machines in the Z: drive. If you have trouble locating it you may need to search for it.

## Description:

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- This tutorial will introduce you to controlled experiments. Your group will design and run a small experiment to compare two types of soft keyboards

## Objectives:

- By the end of the tutorial, you will be able to:
  - Design and run a very simple experiment, including
  - Identifying independent variables
  - Identifying dependent variables
  - Defining an experimental procedure
  - Critically analyze tradeoffs of different design decisions

## Deliverables:

- This is an unmarked assignment, but is required for completion of the next tutorial. Each group needs to compile the results of their experiment in this sample Excel file: [http://www.cs.ubc.ca/~cs444/tutorials/Exptl\\_GroupDatasheet.xls](http://www.cs.ubc.ca/~cs444/tutorials/Exptl_GroupDatasheet.xls). Change the name of the file to your group name, and one team member email this to your TA by midnight on the day you run the experiment.
- Also, make sure you keep all of your notes from this tutorial because they will be useful in writing up the individual assignment given in the next tutorial.
- Students should bring completed questionnaires to next tutorial. Responses should be analyzed.

## Tentative Schedule:

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- Quiz + discussion (~15 min)
- Experiment background and setup
  - Review introduction and background to the experiment (~7.5 min)
  - Verify experimental software and generated log files (~7.5 min)
- Experiment design discussion (~10 min)
- Run experiment (~45 min)
  - See procedure (below)

- Informal analysis (~5 min / time permitting)
  - look over your data and see if you can quickly identify any trends
- Design brainstorm (time permitting)

## Experiment Procedure:

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*The following description should be read to each subject at the beginning of the experiment. Italicized text provides instruction to the experimenter.*

- Before you begin:
  - You should have a worksheet available for the subject. Assign the subject a number. Assume this one is Subject 1.\_
  - If you are using a personal computer, make sure you have connected a mouse – you should not use the track pad.
- After each subject:
  - Record data from [ExperimentLog?.txt](#) into worksheet

### 1. Description

*Introduce yourself.*

- "My name is \_\_\_\_\_. You're helping us by trying out a new product in the early development stages. We have several different versions of this product, and we're looking to see which version is the easiest to use. If you have trouble with some of the tasks, don't feel bad; that's exactly what we are looking for. Remember, we are testing the product versions, not you."

*Tell the participant that it's OK to quit at any time.*

- "If you should become uncomfortable or find this test objectionable in any way, you are free to quit at any time."

*Tell them about the experiment, and record the subject ID.*

- "Our team is working on a computer that does not have a keyboard. Because text entry may be occasionally required, we plan to use a simulated keyboard, such as the one you see in front of you, on which people can "mouse type". Show them the screen. The keyboard includes only lower case letters and a space bar. There are no numbers or backspace key. Anything you type appears on this one line entry."
- "You "mouse-type" by selecting a key on the screen. For example, I will type your subject identification, which is "subject one". Notice that I have to press this button on the upper corner before it will let me type."
- "Click the "Press here to begin" button and mouse-type the subject ID."
- "When you are done, click the "Press here when done" button to tell the system you have finished."

### 2. Instructions

*Select the Phone Pad layout.*

- "This layout is called a phone pad keyboard. I'll type the word 'test' on it to show you how it works."
- *Start typing.* "You type a letter by pressing and cycling through each letter on a key until the correct letter appears. Once you have finished entering a letter, you have to press the '>' key. To type a space, you have to press the '>' twice."

*Leave a space and show that the letters s and z require 4, not 3 button presses.*

- "Also notice that the 'prs' button includes the letter 'q', while the 'wxy' button includes the letter 'z'."

*Select the Alphabetic layout.*

- "This layout is an alphabetic keyboard. Notice that the letters are arranged in alphabetic order. I'll type the word 'test' on it to show you how it works."

### 3. Pre-test Questionnaire

*\*Note\*: Don't tell subjects about the possible advantages or disadvantages of each method. Administer the pre-test questionnaire on the worksheet. Write down the answers as they are supplied.*

- "Before we begin the typing task, I would like you to answer a few questions on this form."

### 4. Tasks

*Don't forget to record any comments on the worksheet.*

- "For all the typing tasks, I am going to ask you to type as fast as you can. However, I want you to avoid typing errors. If you do make an occasional mistake, just keep on going... there is no backspace key! If you make many errors, then you are probably trying too hard and you should slow down a bit."

*The order in which you run these experiments will be assigned by your TA. For illustration, assume the order is Phone first and Alphabetic second.*

*Layout 1: Change the layout to the Phone keyboard and give the task sentences to the subject.*

- 1. *Practice sentence*: "This first sentence is for you to practice with. First, read the first sentence aloud, and start whenever you are ready. Don't forget to press the begin and finish buttons before and after the sentence."
- *\*Note\**: *If subjects forget to press the start/end button for each sentence, remind them!*
- 2. *First test sentence*: "Now do the same with this sentence. We will be recording your typing time and errors, so go as quickly as you can and try to keep your typing errors down. Read the sentence aloud and start whenever you are ready."
- 3. *Second test sentence*: "Now here is the last sentence with this keyboard. Read it aloud and start when ready."
- 4. *Ask the following question and record comments on the worksheet*: "What do you think about mouse-typing with this layout?"

*Layout 2: Repeat steps 1-4 for the alphabetic layout.*

- "I'll switch to the next keyboard layout...."

### 5. Post-test Questions

*Record answers on the worksheet.*

- "Now that you have used both keyboards, which do you like better? Do you have any other comments to make?"

*Record the results. You may want to ask other questions on oddities that you may have observed.*

*At this point, the experiment is complete. You can answer any questions that the subject may have. Thank them. Finally, record your own observations of what you saw that were not captured by subject's comments.*

## Installing Tcl/Tk and Running KeyboardExperiment.tcl

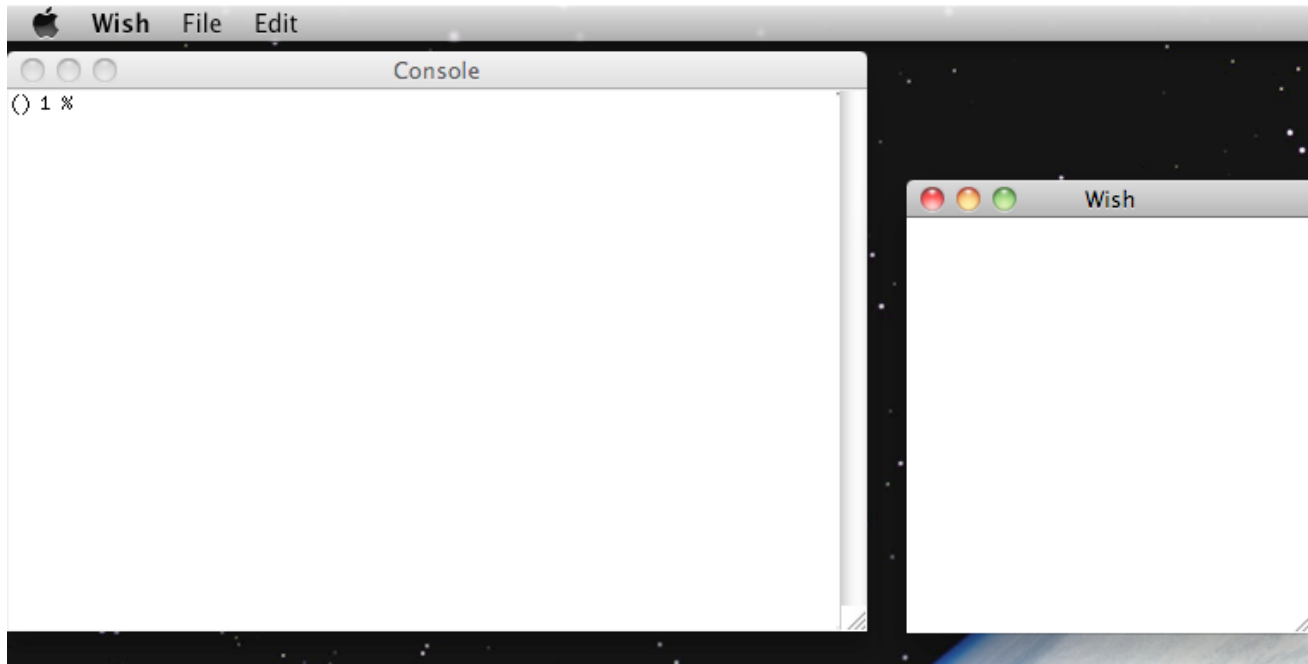
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- **Required only if you cannot run the stand-alone versions on your personal computer.**
- 1. Download the appropriate ActiveTcl distribution from ActiveState at <http://www.activestate.com/activetcl/downloads> (Version 8.5.9.0. at time of writing)

- 2. Open the download to run the installer.

## Instructions for Mac:

- 3. Once the installation is complete, launch the wish shell application called "Wish 8.5" from 'Applications' > 'Utilities'.
- 4. You should see two windows. The "Wish" window will contain the application and the "Console" window is where you can type in Tcl/Tk commands. (You won't need to use the Console to complete the tutorial).



## Running KeyboardExperiment.tcl on Mac

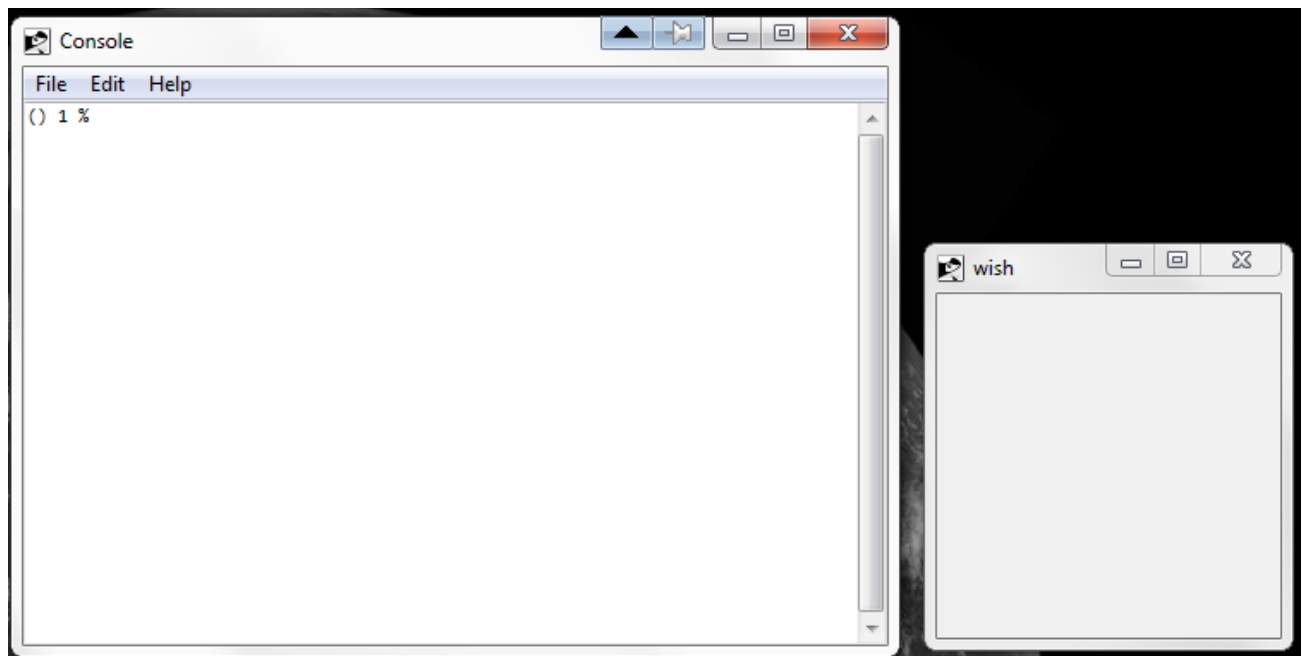
- 5. Download [http://www.cs.ubc.ca/~cs444/tutorials/ExptI\\_KeyboardExperiment.tcl](http://www.cs.ubc.ca/~cs444/tutorials/ExptI_KeyboardExperiment.tcl) from the cs444 website
- 6. From the wish menu bar go to 'File' > 'Source...' and select KeyboardExperiment.tcl.
- 7. You should now see the Keyboard Experiment application in the wish dialog!
  - **Note:** the ExperimentLog.txt file generated by the application should be in your home directory (i.e. Users/Jessica/). If not, use Finder to search for it.

## Instructions for Windows

- 3. Once the installation is complete, go to the command dialog ('Start' > 'Run' and type in 'cmd'). From here you can launch the Wish shell by typing the following:

```
C:\Tcl\bin>wish85
```

- **Note:** Change the path accordingly if you installed ActiveTcl to a location other than C.
- 4. You should see two windows. The "Wish" window will contain the application, and the "Console" window is where you can type in Tcl/Tk commands. (You won't need to use the Console to complete the tutorial).



### Running KeyboardExperiment.tcl on Windows

- 5. Download [http://www.cs.ubc.ca/~cs444/tutorials/Expt1\\_KeyboardExperiment.tcl](http://www.cs.ubc.ca/~cs444/tutorials/Expt1_KeyboardExperiment.tcl) from the cs444 website
- 6. From the Console menu bar go to 'File' > 'Source...' and select KeyboardExperiment.tcl.
- 7. You should now see the Keyboard Experiment application in the wish dialog!
  - **Note:** the ExperimentLog.txt file generated by the application should be in either the C directory or Users/[UserName]'.

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