LING 408/508: Programming for Linguists

Lecture 3
August 31st
Administrivia

Homework 1 graded
Today’s Topics:

– Review Homework 1
– VirtualBox
– Ubuntu install (your Homework 2)
Homework 1

1. Encode Pi as accurately as possible using both the 64 and 32 bit floating point representations
   **Instruction**: draw the diagram and fill in the 1's and 0's

2. How many decimal places of precision is provided by each of the 64 and 32 bit floating point representations?
Homework 1 Review

- 32 bit (float) representation
  - Sval:
  - ExpVal:
  - FracVal:

\[
\begin{align*}
\text{Sval} & \equiv (-1)^\text{S}\times2^{\text{ExpVal}}
\end{align*}
\]

\[
\begin{align*}
\text{FracVal} & \equiv \sum_{i=1}^{23} b_i 2^{-i}
\end{align*}
\]
Homework 1 Review

- 64 bit (float) representation:
  - Sval: $f_{x} = (-1)^{A2}$
  - ExpVal: $f_{x} = \text{SERIESUM}(2, 10, -1, B2:B2) - (2^{10} - 1)$
  - FracVal: $f_{x} = \text{SERIESUM}(2, -1, -1, M2:BL2) + 1$
VirtualBox

- Virtual x86 machine(s)
  - install other operating systems (OSs) running inside a window, we’ll install Ubuntu (Linux) as a Guest OS

- Free application at [https://www.virtualbox.org](https://www.virtualbox.org)

Ubuntu 14.04 LTS* under VirtualBox under OS X 10.10.5

*LTS = Long Term Support
Homework 2

• Your homework is to successfully install Ubuntu under VirtualBox on your computer this week (preferably: ready for next class)
  – *this is different from partitioning your hard drive, installing Ubuntu in one of the partitions, and making your machine dual booting (although you could do that) …*

• I’ll walk through the live install Ubuntu here …
• Assume VirtualBox + Extension Pack is installed
  – (I’m using version 4.3.30 now)
VirtualBox

• Download extension pack as well:
  
  - VirtualBox 5.0.2 Oracle VM VirtualBox Extension Pack ⇒ All supported platforms
    Support for USB 2.0 devices, VirtualBox RDP and PXE boot for Intel cards. See this chapter from the User Manual for an introduction to this Extension Pack. The Extension Pack binaries are released under the VirtualBox Personal Use and Evaluation License (PUEL).
    Please install the extension pack with the same version as your installed version of VirtualBox!
    If you are using VirtualBox 4.3.30, please download the extension pack ⇒ here.
    If you are using VirtualBox 4.2.32, please download the extension pack ⇒ here.
    If you are using VirtualBox 4.1.40, please download the extension pack ⇒ here.
    If you are using VirtualBox 4.0.32, please download the extension pack ⇒ here.

• Enable it from VirtualBox Preferences...
VirtualBox

- ISO image: this is an image of a CD.
- Choose 64 bits (recent machine). *32 bits for older machines.*
- 64 bits Mac (for recent Macs) – for booting with a Mac (in BIOS emulation mode)
VirtualBox

• The file ubuntu-14.04.3-desktop-amd64.iso takes considerable time to download (size: about 1GB)
• We don’t boot off real cds anymore; the .iso file is a special file that can be interpreted as a virtual cd
• ISO images:
  – Macs can mount ISO images.
  – Macs can’t boot off a multitrack ISO image; hence the special adm64+mac version.
  – some versions of Windows can’t mount an ISO image (without extra software). Install Microsoft’s Virtual CD-ROM Control Panel.

• Next, we need to create the virtual machine on which we’re going to install Ubuntu on
VirtualBox

- Step 2: in VirtualBox, select New and give new virtual machine of type Linux a name
VirtualBox

- Need to add your .iso file in Settings > Storage:

Select your downloaded .iso file
VirtualBox

- Dynamically allocated virtual hard drive:
VirtualBox

File location and size

Please type the name of the new virtual hard drive file into the box below or click on the folder icon to select a different folder to create the file in.

Virgin Ubuntu 14.04

Select the size of the virtual hard drive in megabytes. This size is the limit on the amount of file data that a virtual machine will be able to store on the hard drive.

8.00 GB

4.00 MB  2.00 TB

Go Back  Create  Cancel
VirtualBox

• Created Virtual Machine:
VirtualBox
VirtualBox

Please select a virtual optical disk file or a physical optical drive containing a disk to start your new virtual machine from.

The disk should be suitable for starting a computer from and should contain the operating system you wish to install on the virtual machine if you want to do that now. The disk will be ejected from the virtual drive automatically next time you switch the virtual machine off, but you can also do this yourself if needed using the Devices menu.

ubuntu-14.04.3-desktop-amd64.iso

Go Back  Start  Cancel
• **Step 3:** start your virtual machine, install Ubuntu:
Ubuntu
Ubuntu

Installation type

This computer currently has no detected operating systems. What would you like to do?

- Erase disk and install Ubuntu
  Warning: This will delete all user data, documents, photos, music, and any other files in all operating systems.
- Encrypt the new partition
  You will choose a strong passphrase.
- Use LVM with the new partition
  This will set up LVM to manage space.
- Something else
  You can create your own partition layout.

Write the changes to disks?

If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to make further changes manually.

The partition tables of the following devices are changed:
SCSI3 (0,0,0) (sda)

The following partitions are going to be formatted:
partition #1 of SCSI3 (0,0,0) (sda) as ext4
partition #5 of SCSI3 (0,0,0) (sda) as swap

[Go Back] [Continue]
Ubuntu
Ubuntu
Ubuntu
Ubuntu 14.04

Welcome to Ubuntu 14.04

Fast and full of new features, the latest version of Ubuntu makes computing easier than ever. Here are just a few cool new things to look out for...

Almost finished copying files...
Ubuntu

• Virtual Box > Devices > Insert Guest Additions CD
Ubuntu

- Guest Additions:

```
The headers for the current running kernel were not found. If the following module compilation fails then this could be the reason.
Building the main Guest Additions module ... done.
Building the shared folder support module ... done.
Building the OpenGL support module ... done.
Doing non-kernel setup of the Guest Additions ... done.
You should restart your guest to make sure the new modules are actually used.

Installing the Window System drivers
Installing X.Org Server 1.17 modules ... done.
Setting up the Window System to use the Guest Additions ... done.
You may need to restart the the Window System (or just restart the guest system) to enable the Guest Additions.

Installing graphics libraries and desktop services components ... done.
Press Return to close this window...
```
Ubuntu
Ubuntu

- After restart, login, System Settings > Details
Ubuntu

Ubuntu 14.04 LTS

Updated software is available for this computer. Do you want to install it now?

Details of updates

- 130.9 MB will be downloaded.

Settings... Remind Me Later Install Now
Ubuntu
Ubuntu

- Ubuntu Software Center
  - App store
  - (full screen to see Search box)
- Software packages
  - Terminal: `sudo` `apt-get install <pkg-name>`
  - `sudo` prefix: means execute the `apt-get` command with superuser privileges (typically needed for packages)
- How to find Terminal: use search

![Ubuntu Terminal image](image-url)
Ubuntu

- Terminal:
  - runs a shell: `bash`
  - enter commands: some are built-in to the shell, others are executable files in specified directories (`$PATH`), still others will require apt-get
  - simple commands:
    - `pwd` print working directory
    - `ls` (or `ls -a`) list current directory (-a option: show . (dot) files too)
    - `cd` change directory
    - `mkdir` create a new directory
    - `which name` the directory where command `name` is located
    - `man name` display manual page for command `name`
    - `echo $SHELL` prints the shell ($ prefixes a variable)
  - pre-defined environment variables: `env`
  - lots of packages are pre-loaded: `wish, python, perl`, etc.

```
sandiway@sandiway-VirtualBox:~$ swipl
The program 'swipl' is currently not installed. You can install it by typing:
sudo apt-get install swi-prolog-nox
```