

Introduction to Linux

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/'lɪnəks/

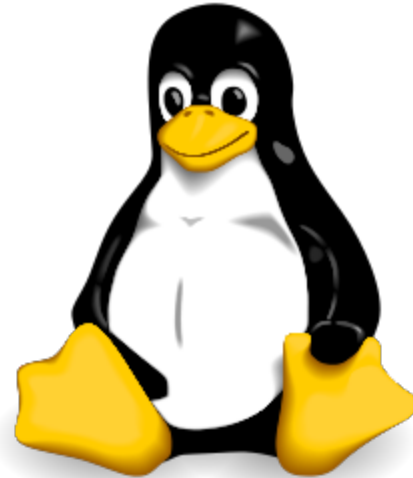
Linux

Venus



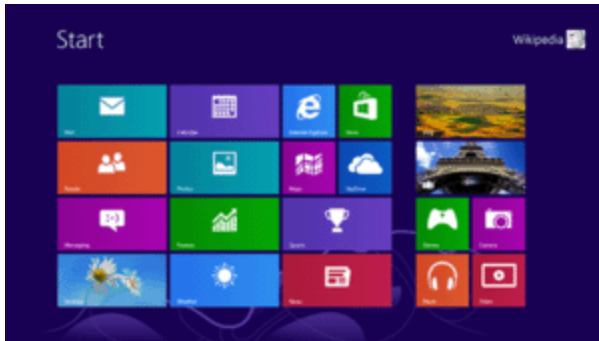
/ˈlaɪnəs ˈtɔrvəːldz/

- Linus Torvalds created Linux in 1991



Linux

- Computer operating system, just like
 - Windows 8, OS X



You should learn it because...

- Some competition environments are Linux
- It is excellent for programming
- It is free
- (It is better than Windows?)

Linux distributions

- Linux is packaged into Linux distributions, or simply called *distro*
- <http://distrowatch.com>
- Ubuntu is one of the most popular one
- /ʊ' bʊntu:/
- good
- food

Live System

- Download the *disk image* and create a *live USB*
- Boot from the USB
- Note that data will be gone after reboot, that's why it is called *live*

Permanent Install

- In the Live System, open the installer and install

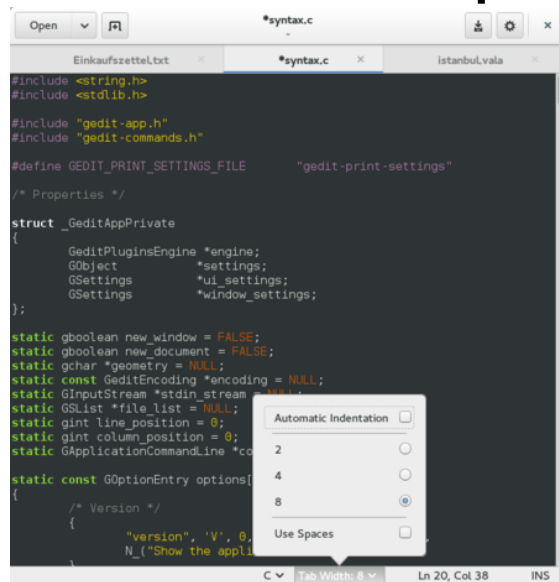
Ubuntu

- For simple tasks, the only difference with Windows is the graphics
- *No Microsoft Office*
- *No Photoshop*
- Chrome, Firefox
- LibreOffice,
Google Doc
- GIMP (image editor)



Ubuntu

- To write code, you may use gedit
- Just like notepad with more features



The screenshot shows the gedit text editor interface. The main window displays a C source file named `*syntax.c`. The code includes headers for `string.h`, `stdlib.h`, `gedit-app.h`, and `gedit-commands.h`. It defines a macro `GEDIT_PRINT_SETTINGS_FILE` and a structure `_GeditAppPrivate` containing pointers to `GeditPluginsEngine`, `GObject`, `GSettings`, and `GWindowSettings`. There are several static variables and constants, including `new_window`, `new_document`, `geometry`, `encoding`, `stdin_stream`, `file_list`, `line_position`, `column_position`, `command_line`, and `option_entries`. A settings dialog is open over the code, titled "Automatic Indentation", with radio buttons for 2, 4, and 8 spaces, and a checked "Use Spaces" checkbox. The status bar at the bottom indicates "Ln 20, Col 38" and "INS" mode.

```
#include <string.h>
#include <stdlib.h>

#include "gedit-app.h"
#include "gedit-commands.h"

#define GEDIT_PRINT_SETTINGS_FILE "gedit-print-settings"

/* Properties */

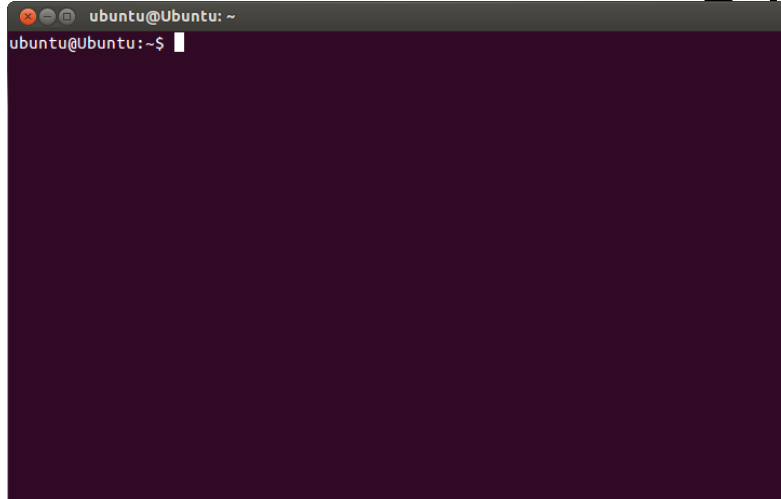
struct _GeditAppPrivate
{
    GeditPluginsEngine *engine;
    GObject *settings;
    GSettings *ui_settings;
    GSettings *window_settings;
};

static gboolean new_window = FALSE;
static gboolean new_document = FALSE;
static gchar *geometry = NULL;
static const GeditEncoding *encoding = NULL;
static GInputStream *stdin_stream = NULL;
static GSList *file_list = NULL;
static gint line_position = 0;
static gint column_position = 0;
static GApplicationCommandLine *command_line = NULL;

static const GOptionEntry options[] =
{
    /* Version */
    { "version", 'V', 0,
      G_OPTION_FLAG_NONE, G_OPTION_ARG_NONE,
      N_("Show the application version"), NULL }
};
```

Ubuntu

- To compile codes, open Terminal
- Similar to command prompt in Windows
- That's the amazing part of Linux :D



Linux Filesystem

- / - root folder
- /home - user home directories
 - /home/alice - alice's home directory
- Common folder structure
(maybe slightly different from distro to distro)
 - /bin - binary programs
 - /usr - user programs
 - /var - log files
 - /etc - configuration files

Linux Filesystem

- In terminal,
 - `cd` - change directory
 - `cd /`
 - `cd /home/myusername/hkoi_past_papers`
 - `cd ~/hkoi_past_papers`
 - `cd`
 - `cd hkoi_past_papers/2015/senior`

Linux Filesystem

- In terminal,
 - `ls` - list files in current folder
 - `ls`
 - `ls -a`
 - list all files (including hidden files, which starts with a dot)
 - two special hidden folders:
 - `.` - current folder
 - `..` - parent folder
 - `cd ./hkoi_past_papers`
 - `cd ../../myusername/hkoi_past_papers`
 - `ls --help`

Manipulating files/folders

- touch a.txt
- cp a.txt b.txt
- mv b.txt c.txt
- rm c.txt
- mkdir folder
- rm -r folder

Commands for writing codes

- `echo "1 2 3 4 5" > a.in; cat a.in`
- `less a.in`
- `head a.in`
- `tail a.in`
- `vim a.cpp`
- `g++ a.cpp -o abc && ./abc < a.in > a.out`
- `diff a.out answer.out`
- `time ./abc`

More commands

- df
- free
- top
- ps
- man less