

Terminal Flow

Becoming a (Linux) Power User

B.EP.301 / M.EP.02b(-L) / M.EP.05b

Term:	Winter 2018/2019	Instructor:	Dr P. S. Langeslag
Time:	Thu 10–12	Office:	SEP 2.306
Room:	KWZ 2.602	Phone:	0551 39 19 706
Credits:	6 (for the full module)	Office hours:	Tue 11–12
Prerequisites:	B.EP.204	E-mail:	planges@uni-goettingen.de

Course Description

This course introduces students to a range of open-source tools natively launched from the UNIX (or GNU/Linux) command line and teaches them how these tools may be used as the basis for an efficient workflow in humanities text processing and research. It requires no prior knowledge of Linux, and can only afford brief introductions to the rich programs and ecosystems covered. Students will learn to rely on software manuals and online communities to solve problems and deepen their understanding of the software used. By the end of the term, students will have a basic familiarity with such environments and aids as the command line (`bash` and `tmux`), regular expressions, Vim, $X_{\text{q}}\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ with `biblatex` and the `beamer` class, Pandoc Markdown, and `git`.

Aims

Students will

- Learn to navigate a Linux filesystem using `bash` over `ssh`;
- Learn where to look for documentation on and community support for UNIX and GNU/Linux tools;
- Learn the basics of regular expression search and replace functions;
- Learn to navigate `tmux` for multitasking and shell persistence;
- Learn to rely on Vim for text processing;
- Learn the basics of $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ and $X_{\text{q}}\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ with `biblatex` and the `beamer` class;
- Learn to use Pandoc Markdown;
- Learn to rely on `git` for version control;
- Be in a position to start using these tools for their coursework and other everyday tasks.

Assessment

In module B.EP.301, students write an exam (90 minutes) covering both the seminar material and the History of the English Language lecture course. The exam will be written at the computer, using the software covered in the seminar. In module M.EP.05b, students submit a term paper of approximately 7,500 words on a medieval topic, supplying parallel $X_{\text{q}}\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ and Markdown source code in addition to corresponding PDF documents. Students of M.EP.02b have a choice between the exam and a term paper of 5,000 words.

Required Texts and Resources

This course requires no textbook. See further down for recommended reading.

Schedule and Homework

Please complete the assignments ahead of the class for the listed date. After setting up your `ssh` connection, all practical assignments are to be carried out in the remote terminal on the course server (in directory `~/work`). If the work is not present on the server by the start of the session, you may be asked to do extra work.

Session 1 (18 Oct): Linux and bash

Tasks to be carried out ahead of this session:

1. Set up your ssh client (see `ssh.pdf`, available on [StudIP](#));
2. Set up a VPN connection (optional; see [GWDG documentation](#));
3. Bring your ssh login credentials to class. If you haven't received any, contact your instructor at least 24 hours before the first session!

Session 2 (25 Oct): File operations

Preparatory homework:

- Watch Collins, "Beginner's Guide to the Bash Terminal" (1h15m);
- Practise the commands it teaches in the remote terminal until you have a basic familiarity with them (but not the user commands `su`, `sudo`, `users`, `id`, and be careful with `rm` and the like).

Session 3 (1 Nov): Vim (1)

Homework due ahead of this session:

Carry out the following operations in the remote terminal, using tools and methods introduced either in class or in Joe Collins's video from last week. If there's something you don't know how to do, google it:

1. Create a directory `~/texts`;
2. Download http://sagadb.org/files/text/egils_saga.en.txt and <http://langeslag.uni-goettingen.de/38334-0.txt> into it;
3. Rename the last file `homilies.txt`;
4. Create a file `~/work/finnhits` containing every line from *Egils saga* containing the string `Finn`;
5. Make `finnhits` read-only;
6. Create a file `~/work/psalmhits` containing every line from `homilies.txt` containing the string `psalm`, regardless whether it is written with or without a capital;
7. Write a short text file `~/work/fileops.txt` with instructions on how each of these steps 1–7 is best achieved. If you know of alternative methods, discuss pros and cons.

Session 4 (8 Nov): tmux for multitasking and multiplexing

Homework due ahead of this session:

1. Run `vimtutor` and follow the instructions;
2. Use Vim to gather your own notes on how to use Vim in a text file `~/work/vimnotes.txt`.

Session 5 (15 Nov): bash scripting and getting help

Homework due ahead of this session:

1. Study the `tmux` tutorial (perhaps easiest to use the PDF provided on [StudIP](#), but it is also in `~/tutorials/tmux.md`);
2. Study the `tmux` man pages (by running `man tmux`) until you have an overview of its basic functions;
3. Use Vim to gather your own notes on the most useful functions of `tmux` in a text file `~/work/tmuxnotes.txt`.

Session 6 (22 Nov): Vim and Regular Expressions

Homework due ahead of this session:

1. Take the Stack Exchange [Tour](#) and read their [Code of Conduct](#);
2. Watch Forsyth, "Getting the Most out of Stack Overflow" (28m20s);
3. Write a bash script `~/work/script.sh` that dynamically
 - (a) Prints the current date;
 - (b) Prints the full path to the current working directory;

- (c) Prints the current server "uptime" (number of days since server reboot);
- (d) Counts and reports the number of words in `~/texts/egils_saga.en.txt`.

Mark the file executable by anyone and ensure it works as intended. If you used any manual pages, web searches, or online communities to get it to work, please report in `~/work/scriptnotes.txt`.

Session 7 (29 Nov): L^AT_EX and X_YL^AT_EX

Homework due ahead of this session:

Download <http://langeslag.uni-goettingen.de/proverbs1.txt> into `~/texts/` and open it in Vim. Open a new file `~/work/vimcommands.txt` in a different tmux window. In the second file, report on how to achieve the following actions in `proverbs1.txt` with the minimum required number of key presses, always starting from the cursor position reached in the previous step. If there is something you don't know how to do, use Vim's `:help` command or online tutorials:

1. Move the cursor to the beginning of line 10;
2. Remove the word "not" from this line;
3. In line 6, turn "wise" into "wisest";
4. Replace the word "hell" in line 12 with "snails";
5. Replace the period or stop at the end of this line with an exclamation mark;
6. In line 14, turn "Cast" into "Cats" and "purse" into "pur";
7. Delete lines 16 and 17;
8. Replace all instances of "son" with "daughter";
9. Return to the start of line 1;
10. Append "and Judah" to the end of this line, but ahead of the period;
11. Save the modified file as `~/work/myproverbs.txt`.

Using the man pages or the Internet, find one Vim trick you consider especially useful. Write up your findings at the end of `~/work/vimcommands.txt` and be prepared to introduce it briefly in class.

Additionally,

1. Study Raisy, "Vim Regular Expressions 101";
2. Download <http://langeslag.uni-goettingen.de/norseverbs.txt> into `~/texts/`, open it in Vim, and carry out the following actions with the help of regular expressions. If there is something you don't know how to do, google it:
 - (a) Remove all blank lines from the document;
 - (b) Change the definition of *drepa* from "hit; kill" into "strike; kill";
 - (c) For all lines where the second column starts with *drepa*, replace `strong_IV` with `strong_V`;
 - (d) Reorder the columns of the file so that the second column is the definition and the third column is the grammatical analysis;
3. Report on your methods in `~/work/regexnotes.txt`.

Session 8 (6 Dec): L^AT_EX and X_YL^AT_EX

Homework due ahead of this session:

1. Study `~/tutorials/xelatex.tex` and `csquotes.tex`;
2. Create, from scratch, a T_EX file `~/work/template.tex` in the `article` class with the basic elements required to write a term paper in X_YL^AT_EX and the following settings and content. If there is something you don't know how to do, look it up:
 - Specify the font `Junicode`;
 - Give your document a title section with author, title, and (dynamically) the date of compilation;
 - A table of contents;
 - A handful of sections and subsections;
 - Use the `lipsum` package to generate random content for each of these sections.
 - **Please disable section numbering for all sections.**

- After compiling but before closing the template file, **comment out** the table of contents, as these are not normally called for in articles.
3. To verify that the pdf has come out correctly, either open it with `evince` from the command line (make sure you are logged in with `X11` forwarding enabled and an `X11` forwarding client such as `XMing` running!), or use your browser to access it in your `public_html` directory at `http://langeslag.uni-goettingen.de/~username/`.

To learn how to carry out this assignment, you can use [the WikiBook on L^AT_EX](#), but it is usually a good idea to look at package-specific manuals as well. These are normally invoked from the command line using `texdoc`, but since you are working in a remote shell you may prefer to access L^AT_EX documentation online at ctan.org on your local desktop instead.

Session 9 (13 Dec): `biblatex`

No homework for this session, but by all means start on next week's.

Session 10 (20 Dec): Slides: L^AT_EX `beamer` class

Homework due ahead of this session:

1. Copy your `template.tex` to a new file `~/work/cited.tex`;
2. Create, from scratch, a `biblatex` bibliography `~/work/cited.bib` containing at least four items until you have matched the following minimum requirements:
 - One book;
 - One journal article;
 - One essay in a volume of essays;
 - One website;
 - One item with two or more authors;
 - One item in a language other than English.
3. Source your bibliography in `cited.tex`;
4. Load the `biblatex-chicago` package and configure it with the options `notes,backend=biber`;
5. Load `polyglossia` (not `babel`) for languages, and set the document's default language to `american`;
6. Load `csquotes` with the option `style=american`;
7. Cite all but one of your sources at various points in the text, using at least one each of the following citation styles:
 - `\autocite`;
 - Two citations in one command;
 - Short citation;
 - Inline citation of the title only;
 - Inline citation of the author(s) only;
8. Produce a bibliography at the end of the document that cites all your sources, including the uncited source;
9. Compile to PDF and ensure that your foreign-language source is displayed correctly.

To complete this assignment, you will have to rely particularly on the documentation for `biblatex` and/or `biblatex-chicago`.

Session 11 (10 Jan): Markdown

Homework due ahead of this session:

1. Study `~/tutorials/xelatex-beamer.tex`;
2. Create a brief L^AT_EX `beamer` presentation `~/work/beamer.tex` on something you've learned in the History of the English Language lecture course this term (if you are in the B.EP.301 module or writing an exam for M.EP.02b[-L]) or the argument of your term paper (if you are writing a paper for this course) or any current or recent research (if you are auditing). It should include the following elements:
 - Images;
 - Hyperlinks;
 - A bibliography slide relying on `biblatex`.
3. Compile to PDF and ensure everything looks as intended. You may be asked to present your slides in class in c. 5 minutes.

Session 12 (17 Jan): git for version control; citations and slides in Markdown

Homework due ahead of this session:

Study the citations extension in MacFarlane, “Pandoc User’s Guide” and produce, from scratch, a document `~/work/refs.md` with the following elements and characteristics:

- Typeset in the Junicode font;
- Indentation on non-initial paragraphs, and zero `parskip`;
- Author, title, date;
- A handful of headings on at least two levels;
- At least one code block (bonus points for syntax highlighting);
- Occasional inline use of a monospace (i.e. fixed-width) font;
- At least one simple table and one multiline table;
- At least one figure (image) licensed under Creative Commons, with a source attribution and hyperlink to your source in the caption.
- It should source a new (!) `biblatex` bibliography `refs.bib` containing at least five items of diverse types;
- It should use the most recent “*Chicago Manual of Style: full note with Ibid.*” `.csl` file from the “[Zotero Style Repository](#)” (you can `wget` the style link and rename the file to give it its `.csl` extension);
- It should contain at least two inline quotations and one block quotation from one or other of the sources in the bibliography, properly referenced;
- It should contain a bibliography with the heading “Bibliography” and listing all contents of the `.bib` file, including items not cited in the article.

Compile to PDF and ensure everything has come out as intended. If any information is lacking from the citations in the PDF, or if any citations are not rendered quite as intended, note your observations in `~/work/pandocnotes.md` (and format this file using basic markdown).

Session 13 (24 Jan): CV Workshop: Markdown

Homework due ahead of this session:

1. Study `/tutorials/markdown-beamer.md`;
2. Watch Schafer, “Git Tutorial for Beginners” (30m33s);
3. Read “Undoing Commits & Changes”;
4. Configure `git` with your name and email address;
5. Create a local `git` repository for your `~/work/` directory;
6. Exclude all \LaTeX and affiliated helper files from the `git` tracker: `*.aux, *.bbl, *.bcf, *.blg, *-blx.bib, *.fdb_latexmk, *.fls, *.log, *.out, *.run.xml, *.synctex.gz`.
7. Make a first local commit of all (other) files in this directory;
8. Copy `~/texts/proverbs1.txt` into `~/work/`;
9. Commit to `git` again, now including the new file;
10. Delete a line from `~/work/proverbs1.txt`;
11. Commit your changes;
12. Undo the last commit so as to return the directory to its previous state;
13. Store your `git` log in `~/work/gitlog` by running `git log > gitlog`.

Session 14 (31 Jan): CV Workshop: \LaTeX

Homework due ahead of this session:

1. Finetune your Markdown CV and come prepared to show and discuss it;
2. Read up on \LaTeX CVs;
3. Produce a first version of a \LaTeX CV and come prepared to discuss best practices.

Diversity Statement

This course is run with the understanding that students bring a variety of backgrounds into the classroom in such domains as socioeconomics, appearance, culture, religion, political views, disability, gender, age, family situation, and sexual identity. With different backgrounds come different needs. If you feel your needs or those of a fellow student require special attention or are being compromised, please feel free to make this known to me by whatever channel seems most appropriate. (For more serious concerns, the Department, Faculty, and University each have their own points of contact as well.) I will treat all requests seriously and with confidentiality, and will seek to make accommodations within my abilities and reason. At the same time, you too owe it to your fellow students to treat them with respect regardless of their background and identity. University should be awesome — for everyone.

References

- “ \LaTeX .” <https://en.wikibooks.org/wiki/LaTeX>.
- Collins, Joe. “Beginner’s Guide to the Bash Terminal.” March 2, 2017. <https://www.youtube.com/watch?v=oxuRxtR02Ag>.
- Forsyth, Adam. “Getting the Most out of Stack Overflow.” July 7, 2013. <https://www.youtube.com/watch?v=CSULRDof8-g>.
- MacFarlane, John. “Pandoc User’s Guide.” <http://pandoc.org/MANUAL.html>.
- “Overleaf.” <https://www.overleaf.com>.
- Raisky, Oleg. “Vim Regular Expressions 101.” <http://vimregex.com>.
- “Resetting, Checking Out & Reverting.” <https://www.atlassian.com/git/tutorials/resetting-checking-out-and-reverting>.
- Schafer, Corey. “Git Tutorial for Beginners: Command-Line Fundamentals.” August 3, 2015. <https://www.youtube.com/watch?v=HVsySz-h9r4>.
- “Undoing Commits & Changes.” <https://www.atlassian.com/git/tutorials/undoing-changes>.
- “Zotero Style Repository.” <https://www.zotero.org/styles>.

Recommended Reading

- Evans, Julie. *Bite Size Command Line*. Computer Wizard Industries, 2018. <https://gumroad.com/l/bite-size-command-line>.
- Kottwitz, Stefan. *\LaTeX : Beginners Guide*. Birmingham: Packt, 2011.
- . *\LaTeX Cookbook*. Birmingham: Packt, 2015.
- Loeliger, Jon, and Matthew McCullough. *Version Control With git*. 2nd ed. Sebastopol, CA: O’Reilly, 2012.
- Robbins, Arnold. *bash: Pocket Reference*. Sebastopol, CA: O’Reilly, 2010.
- . *vi and Vim Editors: Pocket Reference*. 2nd ed. Sebastopol, CA: O’Reilly, 2011.
- Robbins, Arnold, Elbert Hannah, and Linda Lamb. *Learning the vi and Vim Editors: Pocket Reference*. 7th ed. Sebastopol, CA: O’Reilly, 2008.
- Silverman, Richard. *git: Pocket Guide*. Sebastopol, CA: O’Reilly, 2013.
- Stubblebine, Tony. *Regular Expression: Pocket Reference*. Sebastopol, CA: O’Reilly, 2009.
- Vossen, J. P., and Carl Albing. *bash Cookbook*. 2nd ed. Sebastopol, CA: O’Reilly, 2017.