Thunderfox - UNIX Tutorial Site Design Document

Goals

- To teach the user how to use UNIX, starting from the basics
    - Provide information about underlying UNIX/computing concepts
    - How to get into Terminal/Putty
    - Tutorials on how to accomplish certain tasks using UNIX
- To test the user's knowledge
    - Include quizzes on the material taught
- To be used as a reference for UNIX
    - Create an extensive and accessible list of commands that users can come back to
- To teach the background/history of UNIX
    - Who invented UNIX
    - Why to use UNIX?
    - Where it is/was used

User Experience

Audience Definition

- Student - not necessarily new to computing, but new to the concept of command line interfaces and UNIX commands.
- Professor - could have many reasons to utilize the site, maybe to brush up on UNIX, learn new UNIX tricks, or to avoid teaching students the basics. Background in computing not necessarily well established, but generally assumed to have a good idea on how to use UNIX.
- Indecisive buyer/wild card - could have a number of reasons to learn UNIX, and might not know what UNIX is, but it is generally assumed that they have very little background in computing in general.

Personas/Scenarios

Chris - Student

Chris is a first year Computer Science student at RIT. Chris has some programming experience and is very confident in his ability to succeed in the CS program at RIT. However, on the first day of class he realizes that he has to submit his homework through a program that only exists in the UNIX machines in the Golisano College of Computing and Information Sciences.

Chris has never used UNIX in his life. He knows that he needs to understand basic commands for his major classes. Chris can use our page's tutorials for a quick introduction to UNIX and all the commands he might need. The landing page's button links to the beginner tutorials show him where in the site he should start. After the first tutorial, he decides to click on the link to that topic's quiz so he can test his knowledge of the material. He can determine which tutorials are relevant to him because they're titled according to the task they can teach him to do. He also likes that our website provides a tutorial to use Putty, a program that allows him to ssh into the CS computers so that he can do his work from his home computer.

His classes only require that he uses his UNIX knowledge once a week, so he tends to forget the commands. Luckily, he has easy access to our website's reference list of UNIX commands.

John - Professor

John is a professor in the ISTE department at RIT. He is one of the older professors that doesn't like change. John hates the new MyCourses interface so he has decided to stay away from it as much as possible. Instead of using the Dropbox, the only way students can submit their assignments is by pushing it to the department's server. To do that, students must be taught how to use UNIX commands. However, John does not want to waste class time teaching them how to use the command line.

John likes our website because he can send his students to it so they can learn everything they need to submit their work. He also likes to use some of the questions on the quizzes in our website in his own exams.

While reviewing the site to make sure it's up to his teaching standards, John came upon the "Getting Started" tutorial in the tutorial section. He read the section on Windows command line emulators and was very happy to learn that you can simulate a UNIX command line in windows. He installed the command line in his computer using our website's tutorial and now loves it more than the windows' command prompt.

James - Indecisive buyer

James is a 28-years-old man with a stable job. He accidentally poured water on his Mac computer and the Apple store is charging him a ridiculous amount to repair it. James decided that he doesn't want to buy another Mac, but he is used to the operating system and thinks that windows is too far from what he had before.

Some of James' friends have suggested that he gets a new computer with a Linux OS. However, he doesn't know much about this operating system. James decides to research Linux, and finds himself on our site trying to find information about Linux and other UNIX-based operating systems. He lands on the homepage, and goes to the "About UNIX" section He learns about their history and uses, and finally decides to install Linux in a new computer. As he gets

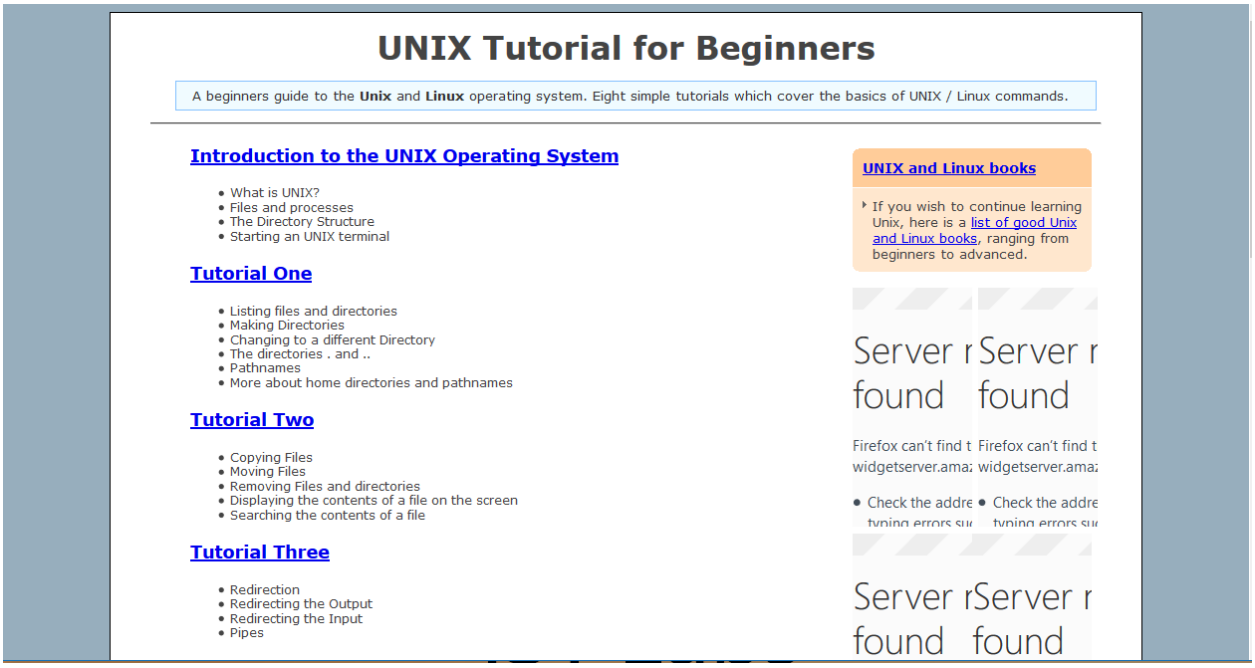
used to the new operating system, James likes to use our page as a reference for the UNIX required to operate his new OS.

Competitive Analysis

Extra screenshots are included in Appendix A

First Site: http://www.ee.surrey.ac.uk/Teaching/UNIX/
Notes:
Content: Proposed as a series of “tutorials” (like classes or lecture notes) rather than raw information. Jumps straight into technical terms without much background information.

Design: Simple. Maybe 4 colors used in total on the entire page. All information is accessible with one click. Lacks features though.
Homepage:



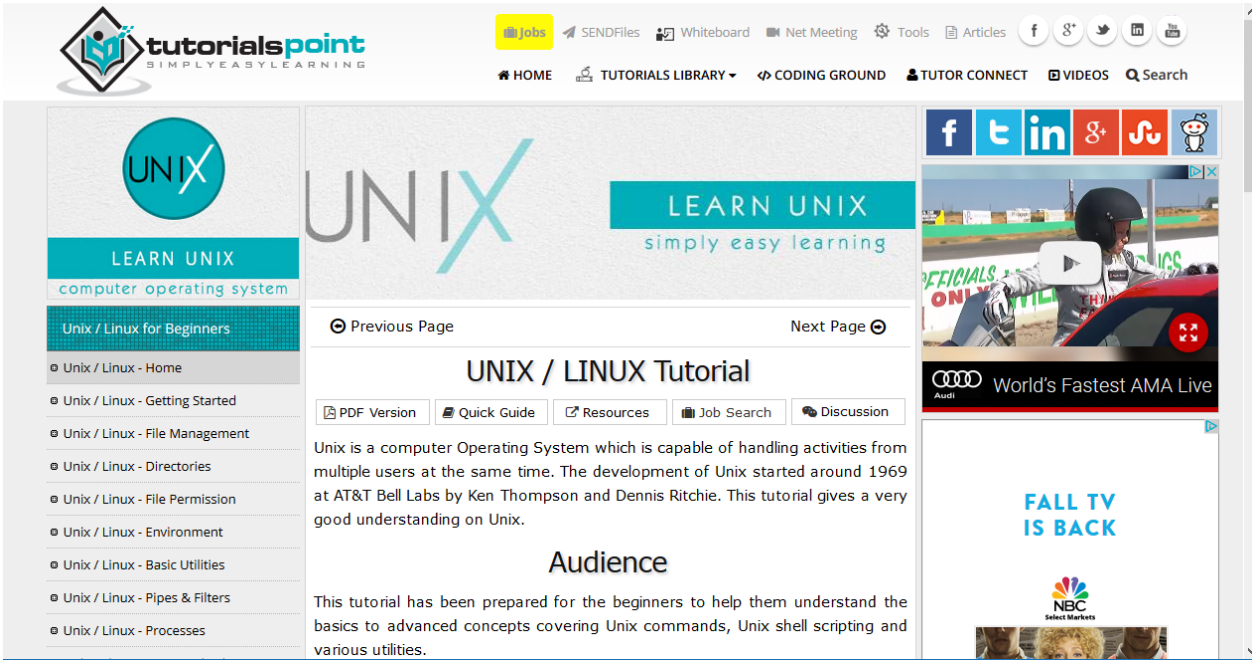
Second site: https://www.tutorialspoint.com/UNIX/

Notes:

Content: Much like the first example, there is a lot of technical terminology without definition. Site is designed for a user who is competent with computers already. Content is very diverse, there is a plethora of it.

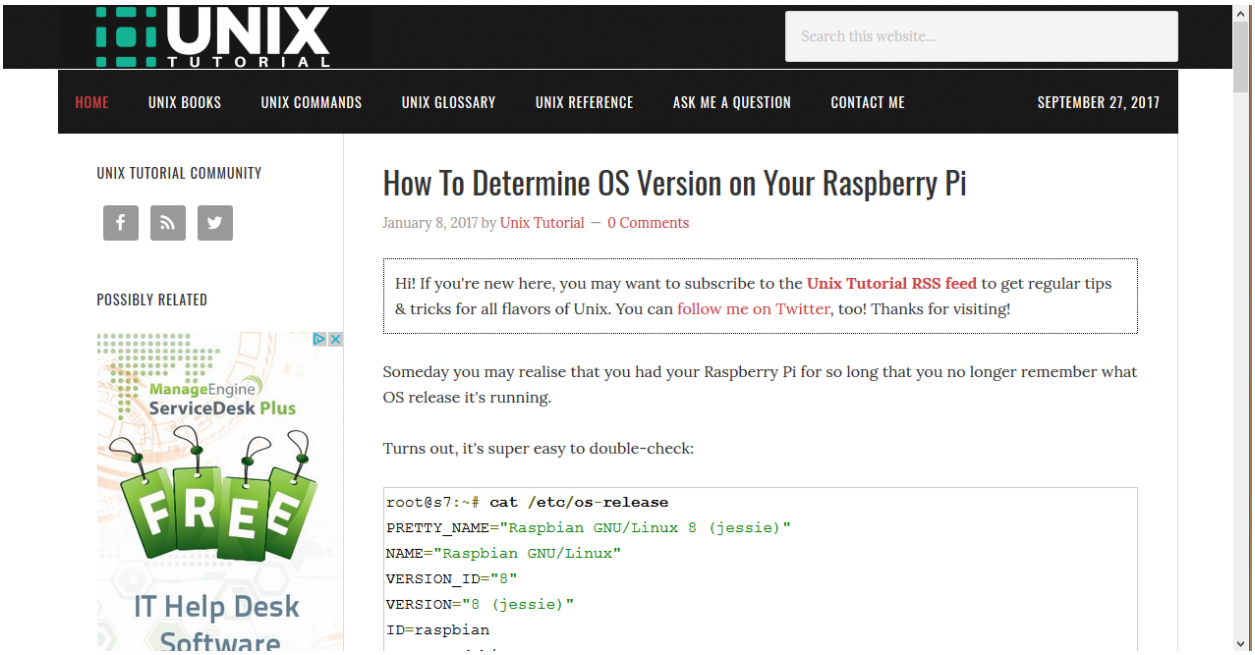
Design: Cluttered at first, but very straight forward once the viewer is adjusted to it. Links and icons on the header of the page are overboard, could confuse new users.

Homepage:



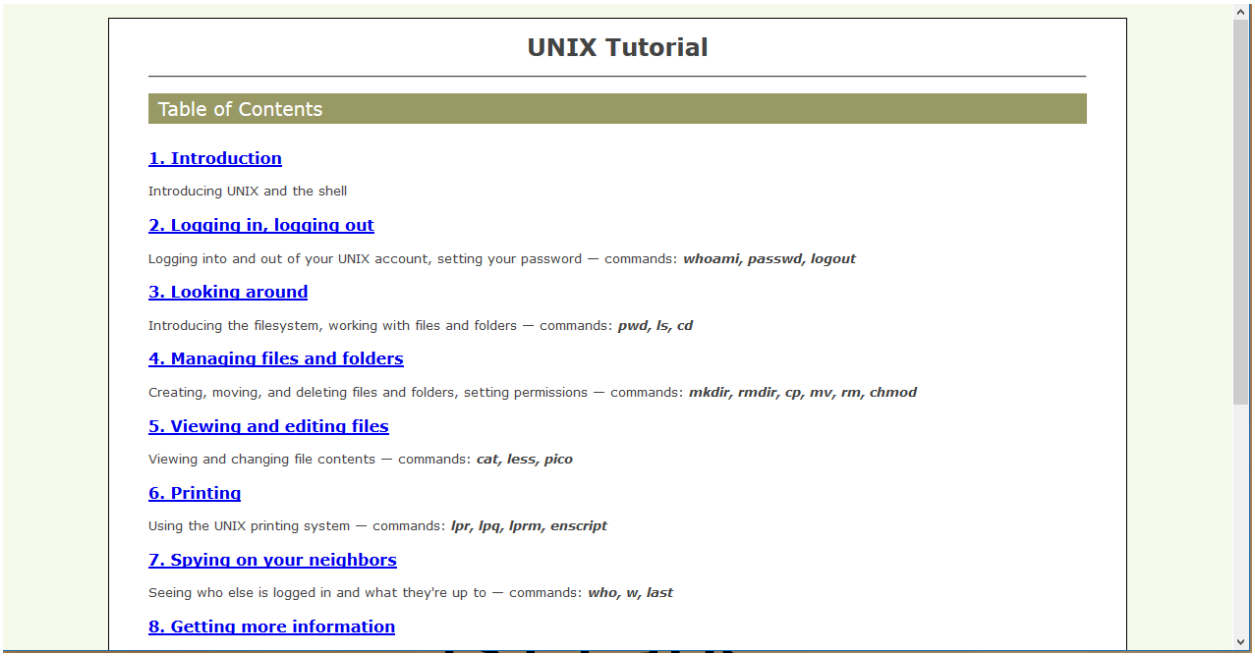
Third site: https://www.unixtutorial.org/
Notes:
Content: Very, very basic nav. List of commands (separated into basic and advanced), a reference guide, a glossary, and a list of books on UNIX (along with a “contact me” tab). More blog-like literature on the first page than actual tutorials on UNIX. Seems to assume the user is more intermediate than amature.

Design: feels like a blog more than a tutorial site. Font and colors are appealing and easy to read.
Homepage:



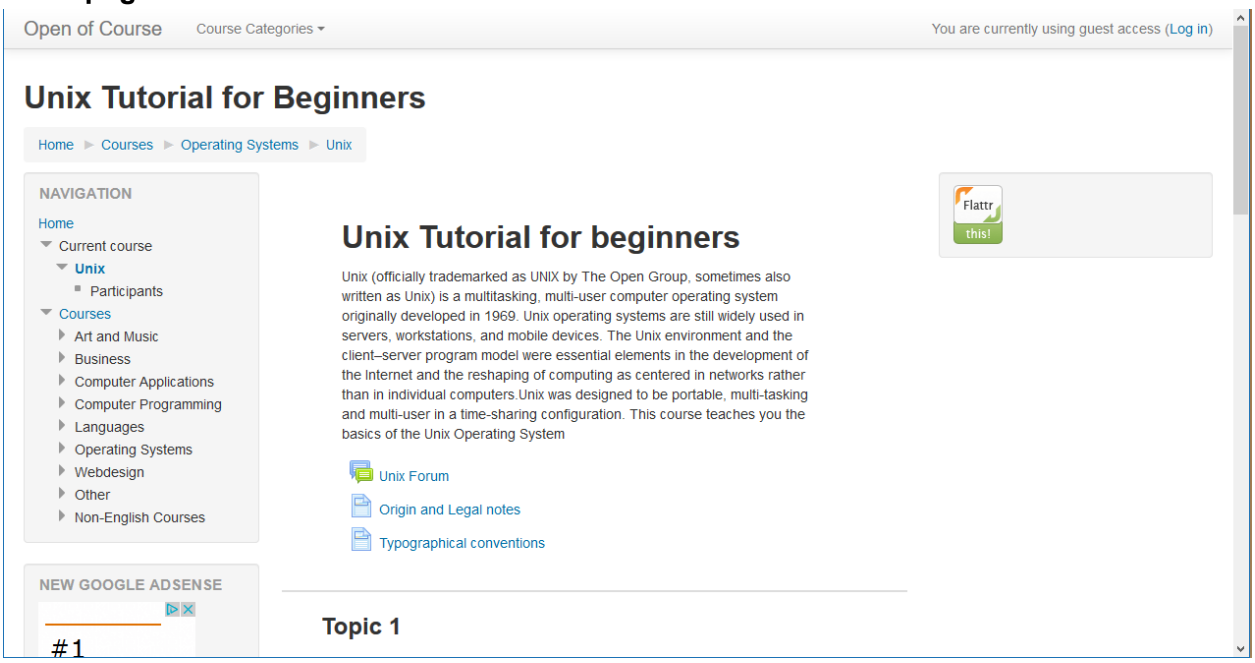
Fourth site: http://people.ischool.berkeley.edu/~kevin/UNIX-tutorial/toc.html
Notes:
Content: almost identical to the first site. Very basic, however it does expand on some of the basic ideas more than the other sites. Site is set up as a series of text lectures with exercises at the end of each to test the users hands on ability.

Design: extremely basic. Three colors. Nothing fancy or eye catching, except the touches done with boxes specifically for code.
Homepage:



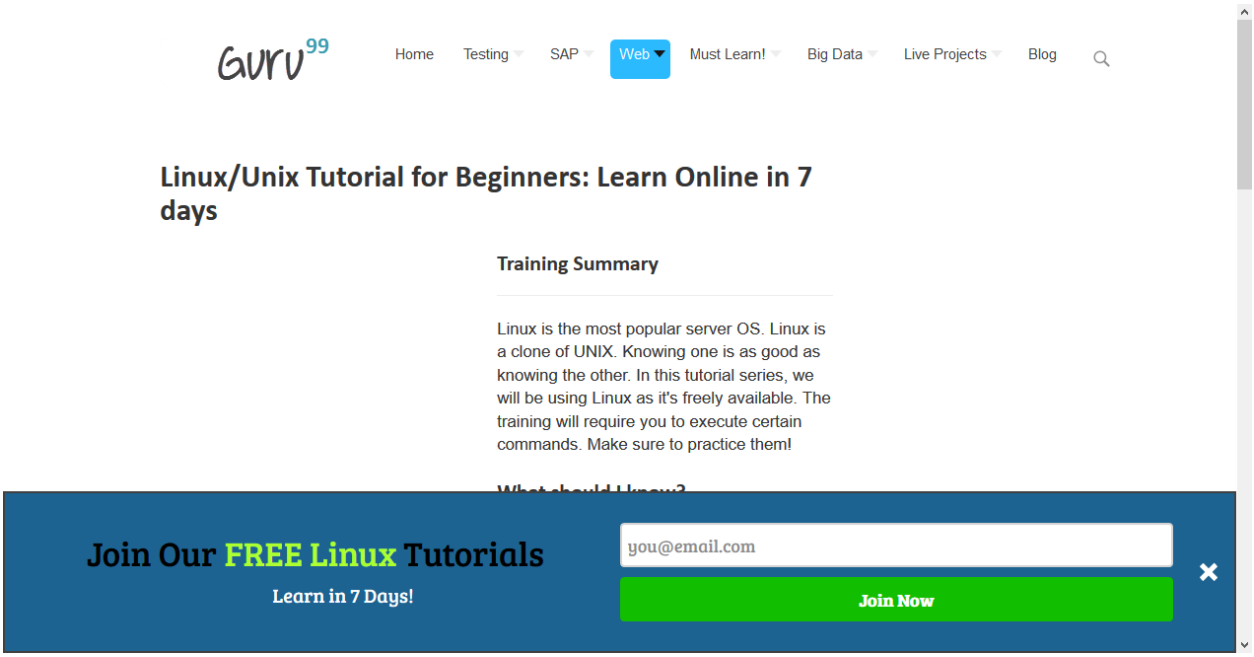
Fifth site: http://www.open-of-course.org/courses/course/view.php?id=45
Notes:
Content: Straight forward, but angled towards users that have a background in computing. Hard to follow. Nav is full of stuff that's unrelated to UNIX.

Design: modern, but somewhat confusing. Too much scrolling and repetition.
Homepage:



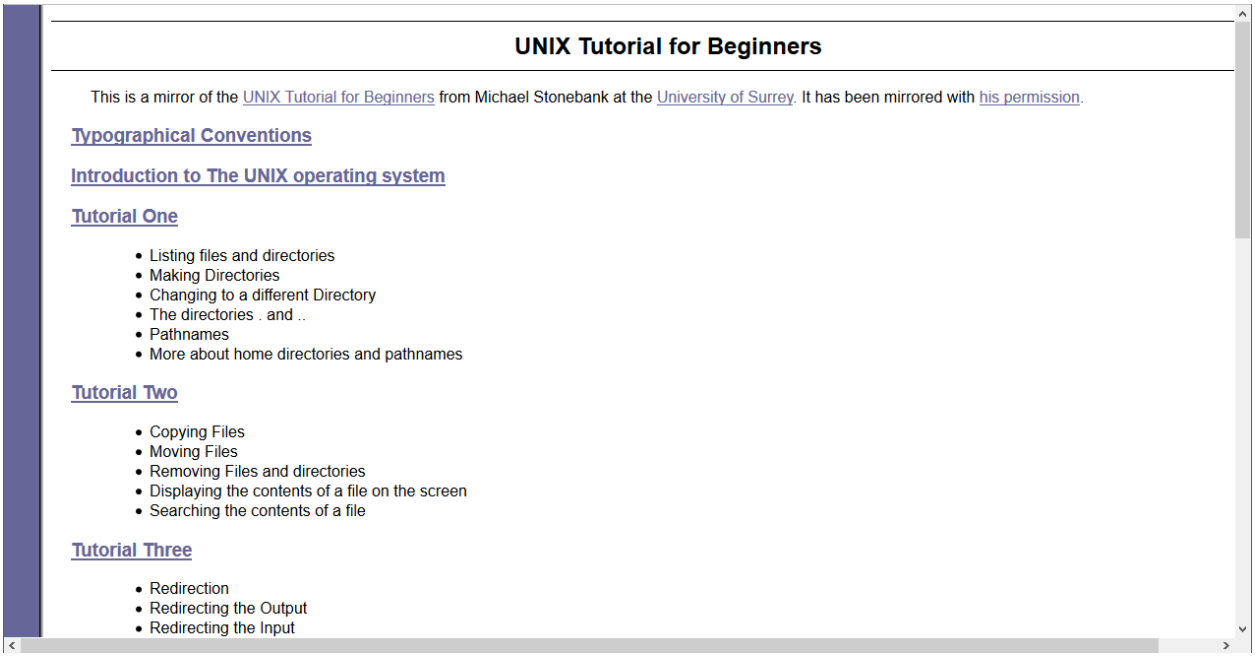
Sixth site: https://www.guru99.com/UNIX-linux-tutorial.html
Notes:
Content: Index page is very barebones, just lists the content in a friendly format that separates each topic into different categories based on difficulty. Starts from the very bottom and works up through all concepts. Probably the best example. Too many ads and popups when browsing, though.

Design: Very barebones, semi-modern design. Flows well and important information stands out with diagrams and other media.
Homepage:



Seventh site: https://www.cs.sfu.ca/~ggbaker/reference/UNIX/
Notes:
Content: Very concise content. Clear as well as short, leaves a summary at the end of each section. No extra navigation.

Design: Content is well defined, the difference between the commands and the notes is very clear. Well contrasting, easy to focus on.
Homepage:



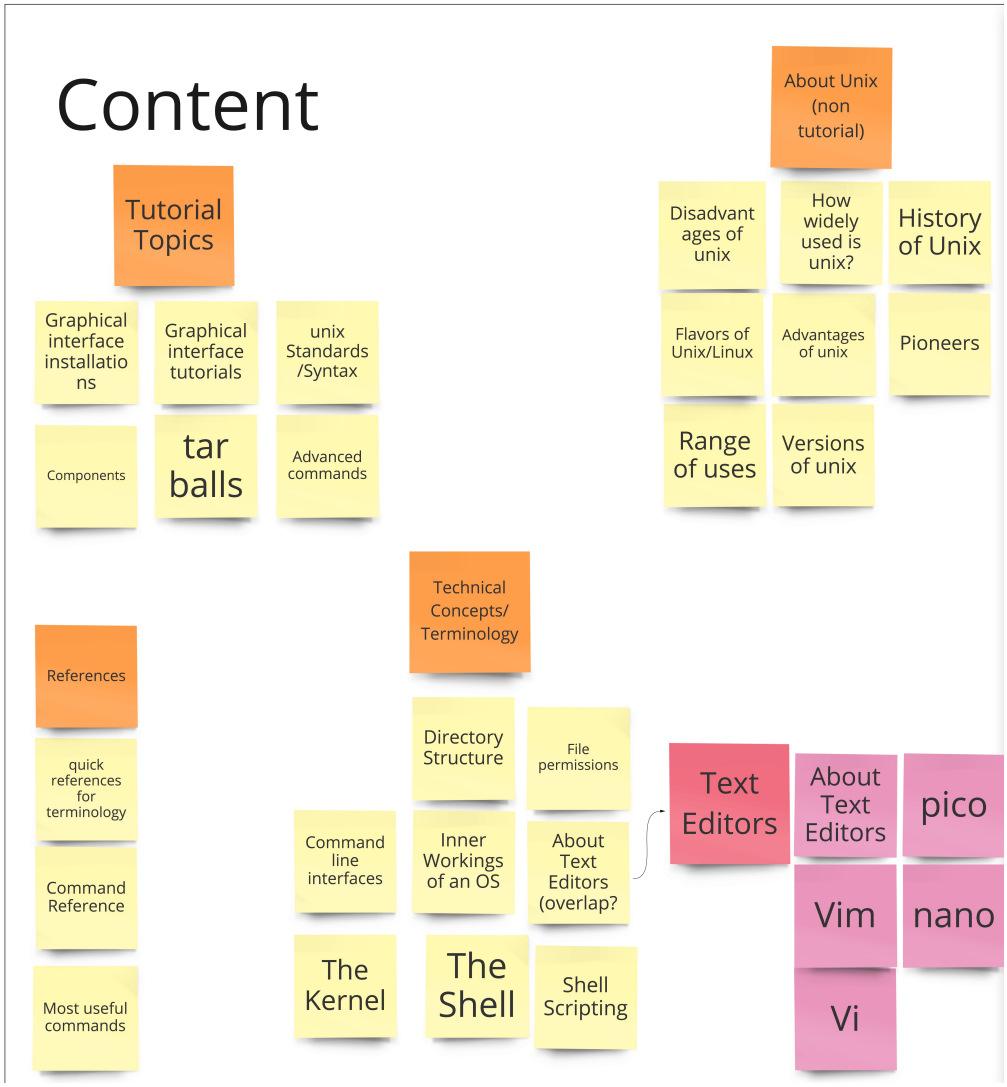
Summary
In summary, it seems that many of the competing sites tend to leave out important foundational concepts or historical context that would leave our entry level consumer at a disadvantage. Many of these sites take a barebones approach with very little excess content or “fluff” which would prove effective to more experienced or technical user, but not necessarily to a beginner. In this case, however, it may be necessary to steer away from excess content to keep the site in line with its goal of teaching UNIX. Thus, ideal design and content combination would be a modern flow with slightly more than barebones content.

Site Content

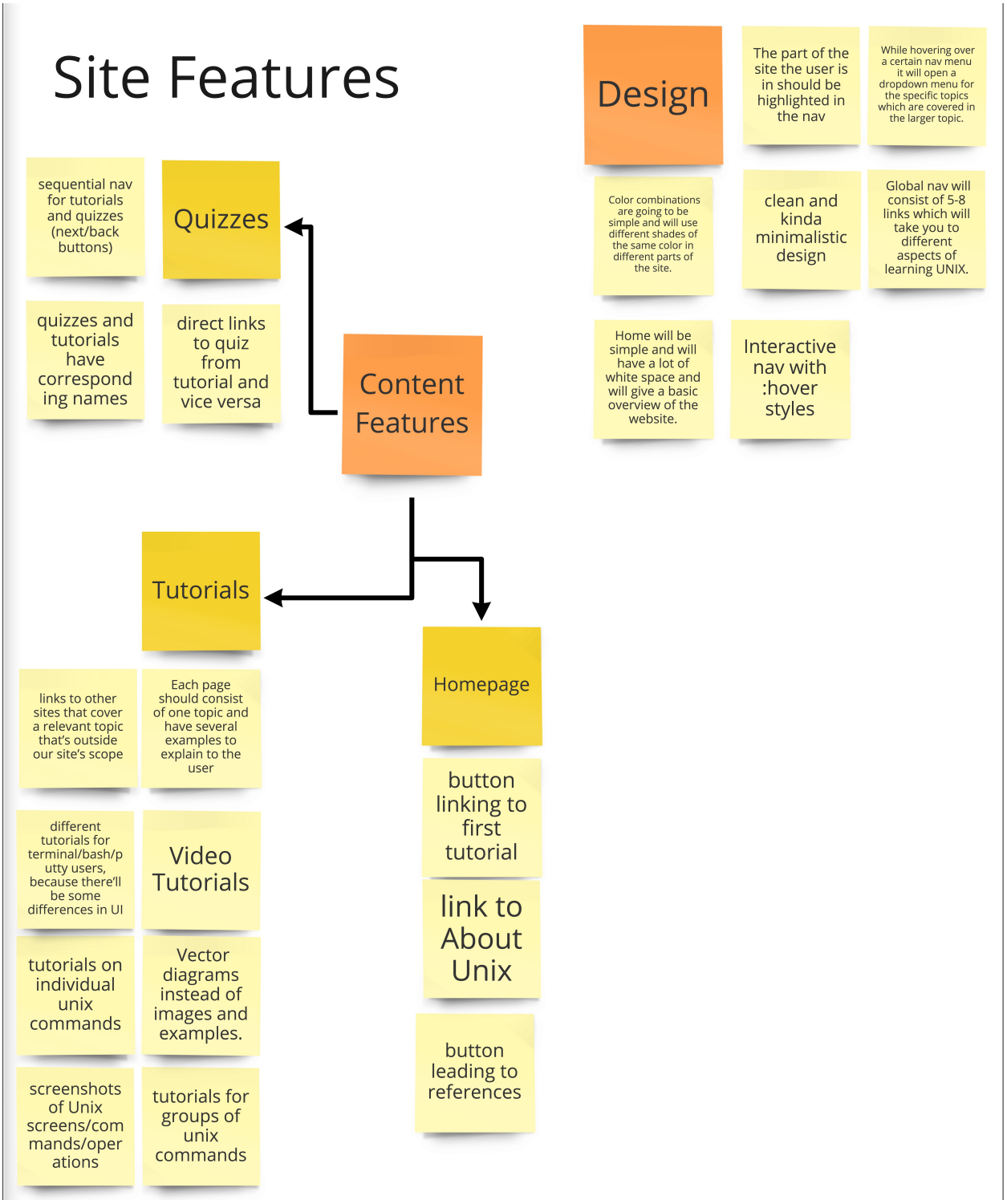
Content Grouping and Labeling

- Home
- Tutorials
- Quizzes
- Reference
- About UNIX
- About Us
- Sources(?)

Organized Sticky Notes



Content Sticky Notes



Site feature Sticky Notes

Site Structure

Site Structure Listing(or Summary)

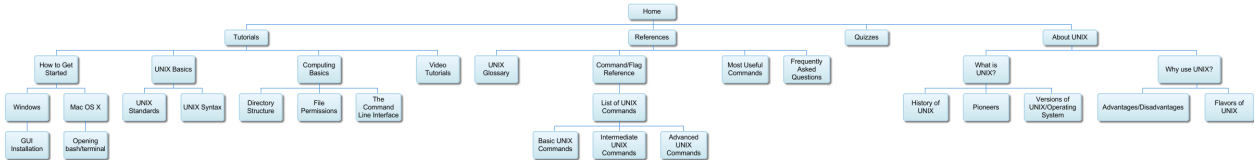
- Home
- Tutorials
    - Computing Basics
        - Directory Structure
        - File permissions
        - The Command Line interface
    - Getting Started
        - Windows
            - Terminal emulator(e.g. PuTTY) installation guide
        - Mac OS X
            - Opening bash/terminal
        - Explain the parts of the display
            - Address any differences between the displays of bash, terminal, and Windows terminal emulators
    - UNIX Basics
        - UNIX Standards
        - UNIX Syntax
        - UNIX Components
            - System Hardware
            - Kernel
            - Shell
    - Video Tutorials
- Quizzes
    - Quizzes correspond exactly to tutorials
- References
    - UNIX Glossary
    - Command/Flag Reference
        - List of UNIX Commands
            - Basic UNIX Commands
            - Intermediate UNIX Commands
            - Advanced UNIX Commands
        - List of Flags
    - Most Useful Commands
    - Frequently Asked Questions
- About UNIX
    - What is UNIX?
        - History of UNIX
        - Pioneers
        - Versions of UNIX/Operating System

        - Flavors of UNIX
    - Why Use UNIX?
        - Advantages/Disadvantages of UNIX
        - Range of uses

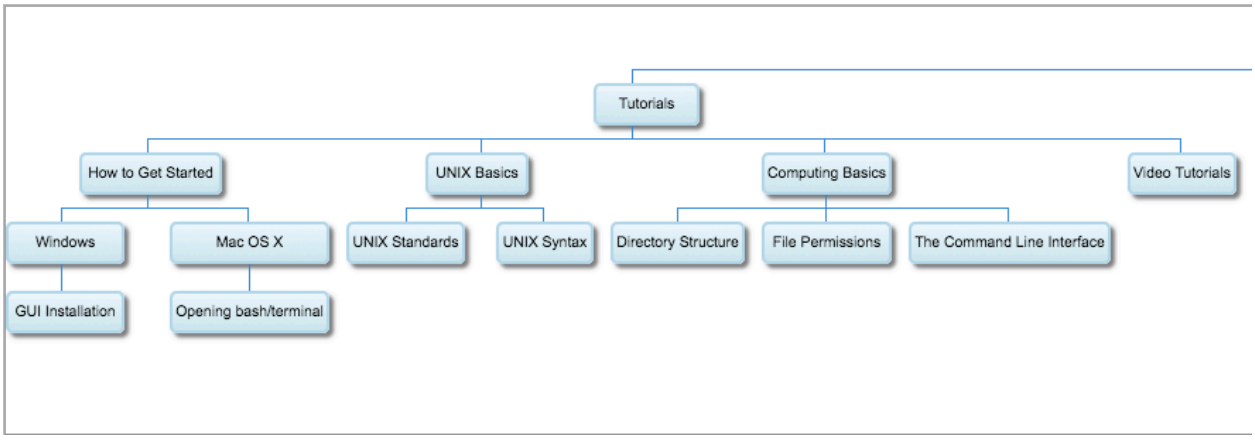
Global and Local Navigation Systems

- The global navigation contains links to all the major sections of the site: Homepage,Tutorials,References,Testing and About UNIX.
- Logo that takes user back to Homepage
- The local navigation for Tutorials-How to Get Started page will have links that teleport between ‘Windows’ and ‘Mac OS X’ pages.
- Tutorials will link to their corresponding quizzes, and vice versa
- Quizzes and tutorials will link to the previous and following topics
- ‘UNIX Commands’ pages, links that quickly take users to different sections.
- Links located on the side of the page that link to each lower level pages.
- Links that directs to external video tutorials.
- Button on every page that can be clicked to quickly jump back to the top of the page

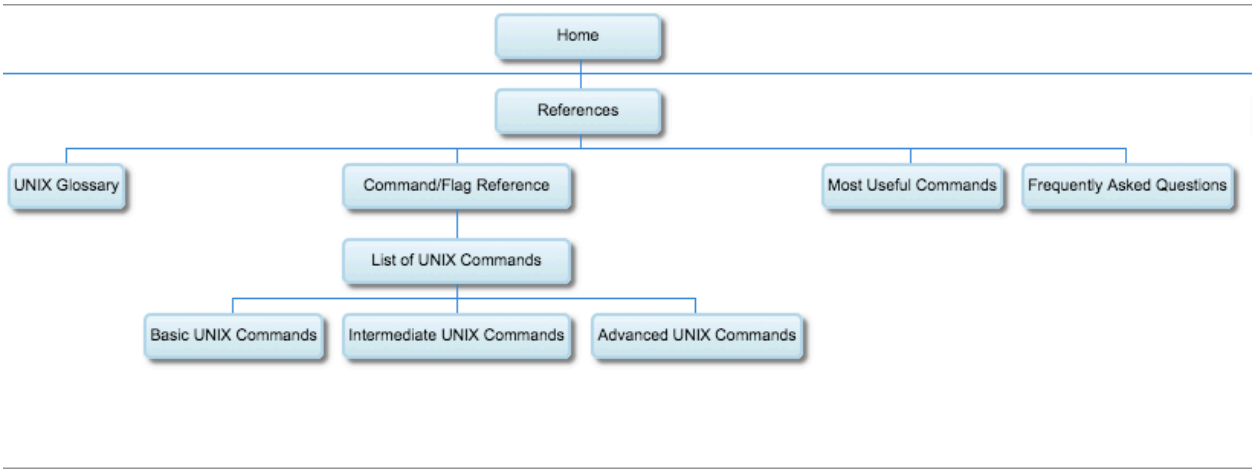
Architectural Blueprints



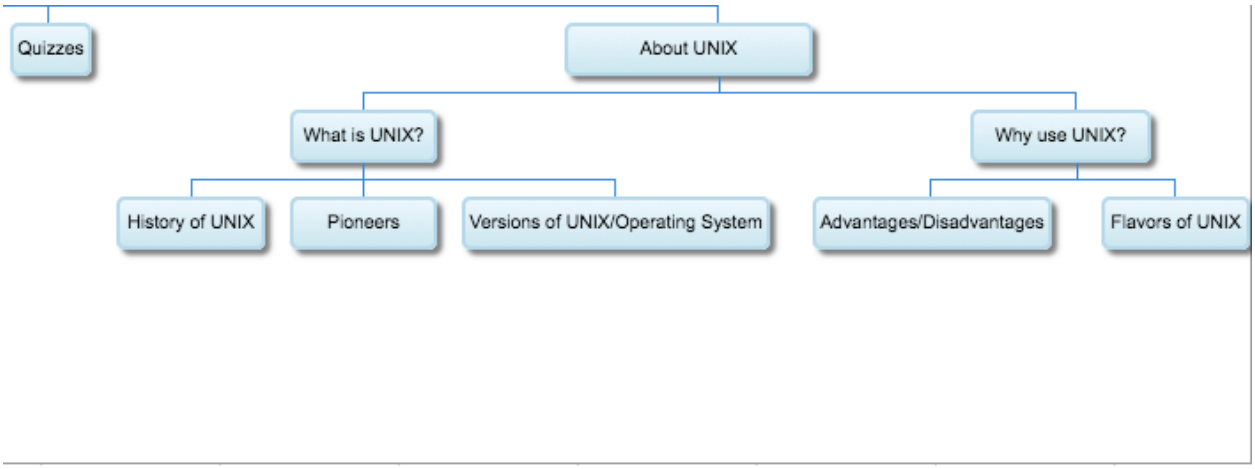
Architectural Blueprints (continued)



Left side of blueprint



Middle of blueprint



Right side of blueprint

Functional Requirements

Structural Requirements

- The web app should be able to host interactive quizzes for the user to take.
- The web app should have functional memory to remember where a user left off.
- The web app should have quiz memory to remember scoring for a particular user
- Possibly have user accounts for individualized tutorial experience?
- The app should provide a general Interactive learning experience for complex subjects (reinforce complex terms/points with rollover functions, external links, clickable diagrams, etc.)
- The app could provide an interactive CLI simulator for the user to test commands they're learning in.

Backend Technologies

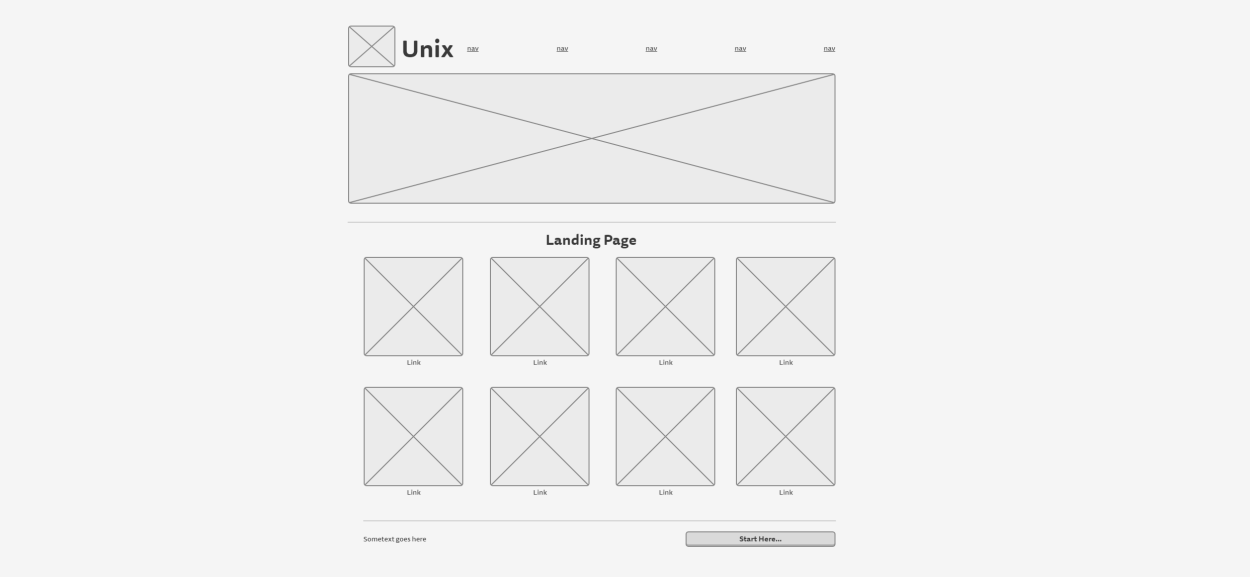
Some backend tech that will need to be implemented to support the above functions:

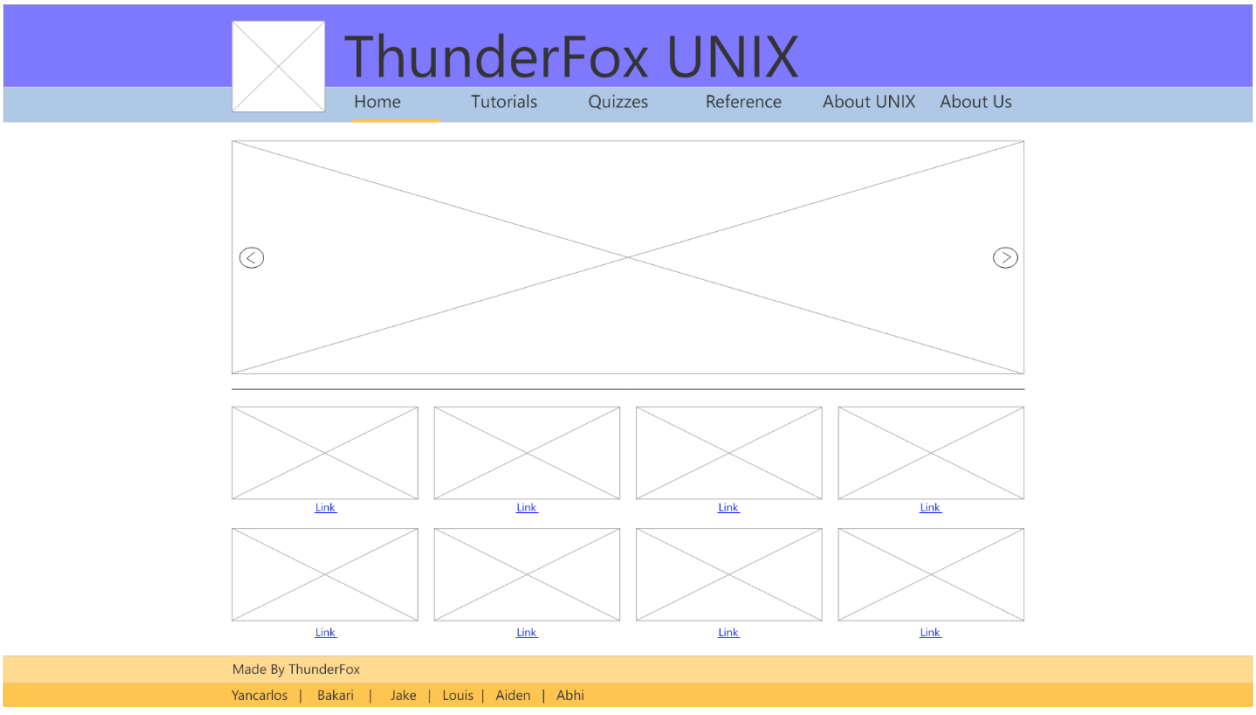
- SQL database for pulling quiz questions/storing user data (if we do accounts)
- PHP for SQL interfacing
- JavaScript for interactive functions with the quizzes and for interactive graphics/content.
- Some kind of parsing system for interactive CLI
- Functional Memory using browser storage

Visual Design

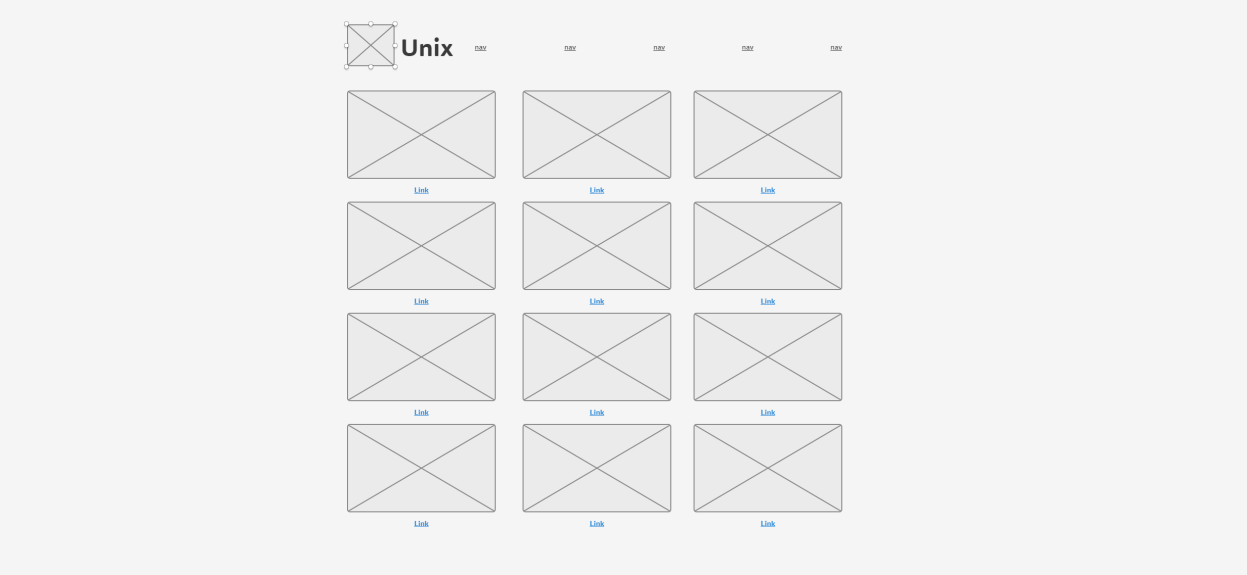
Mock-ups

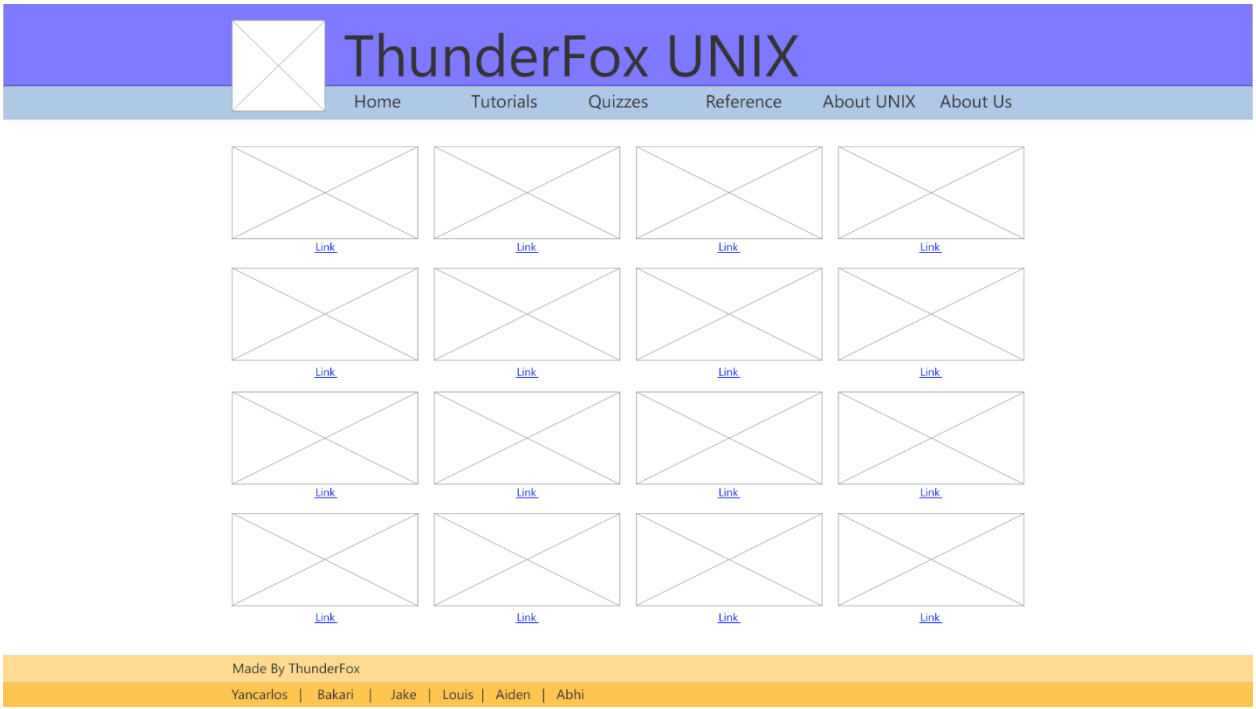
Landing page



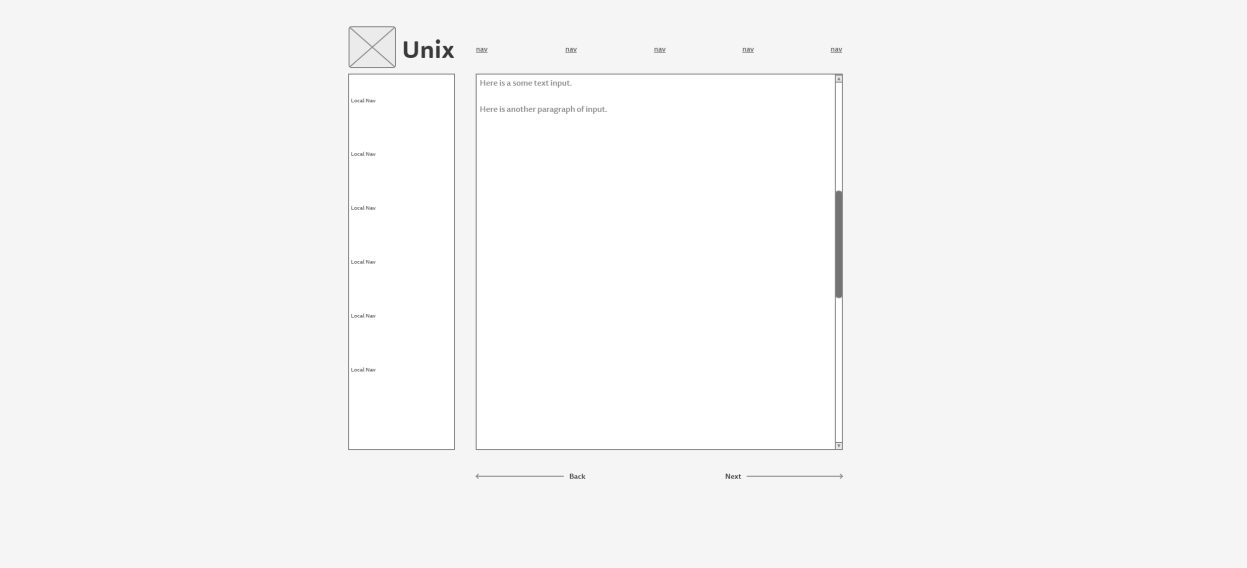


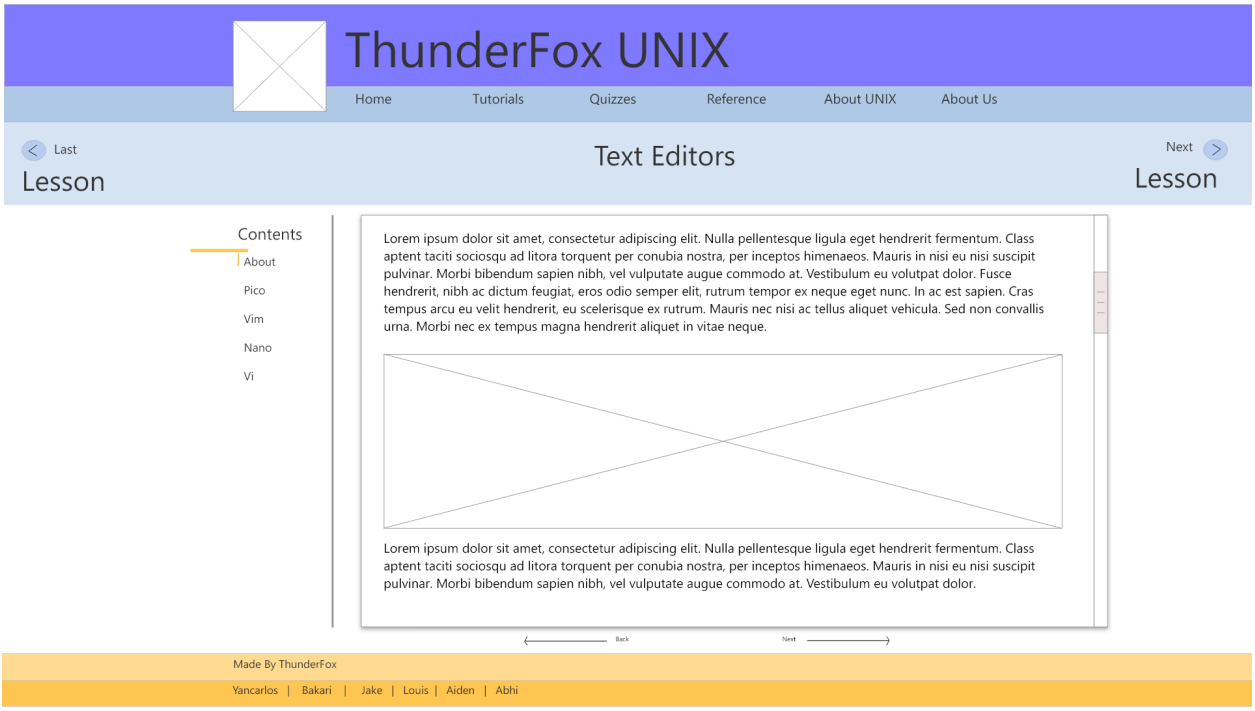
This can be a page where all the topics for the tutorials can be listed



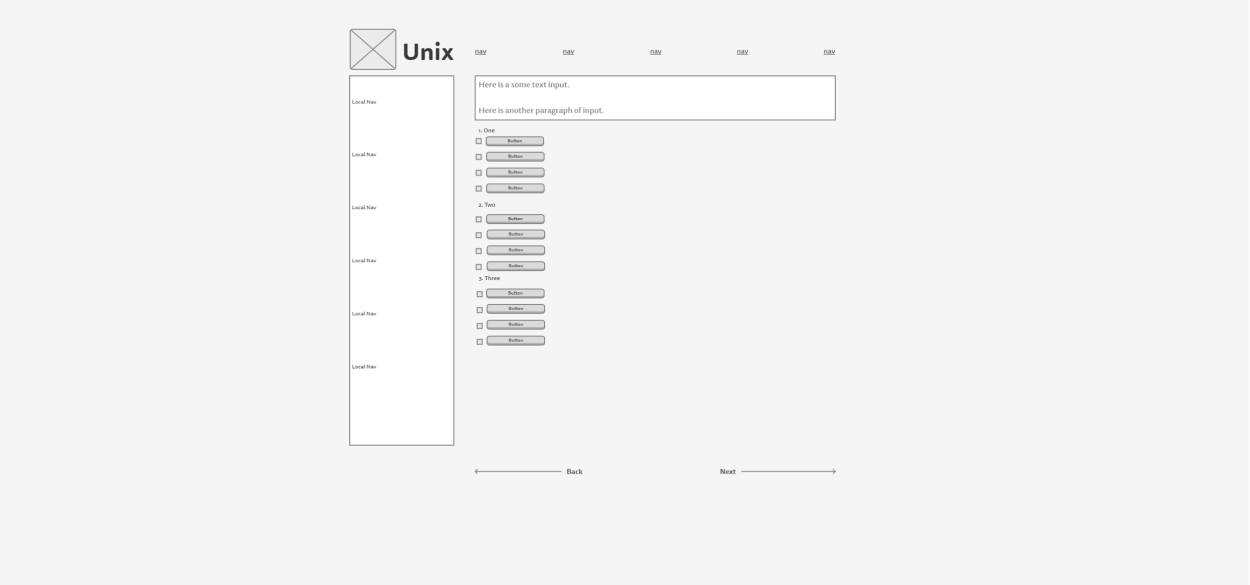


These are some of the tutorials pages we can do.





Quiz Page


Unix
nav
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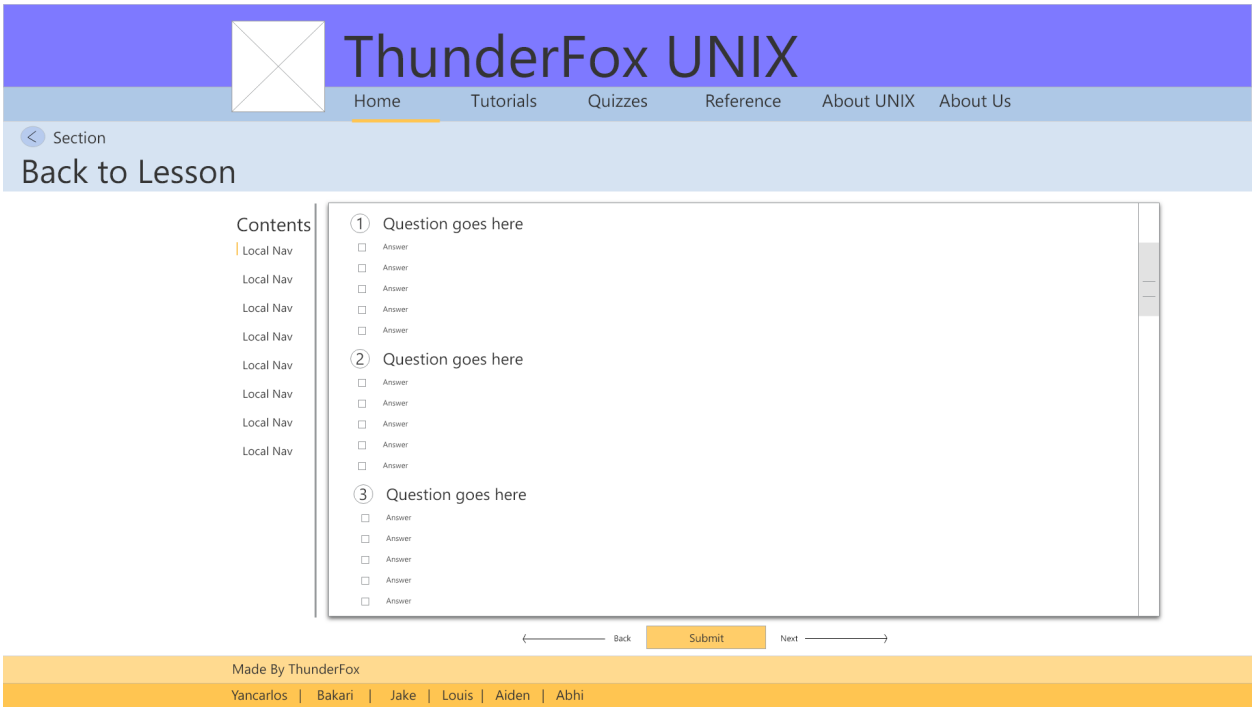
nav
Here is a some text input.
Here is another paragraph of input.
Back
Next


ThunderFox UNIX
Home
Tutorials
Quizzes
Reference
About UNIX
About Us
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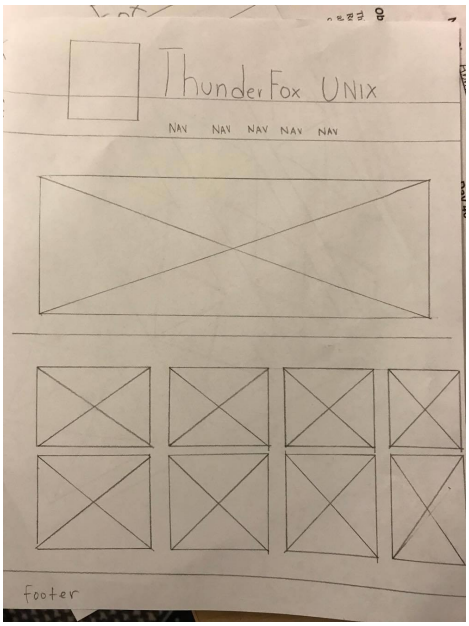
Sketches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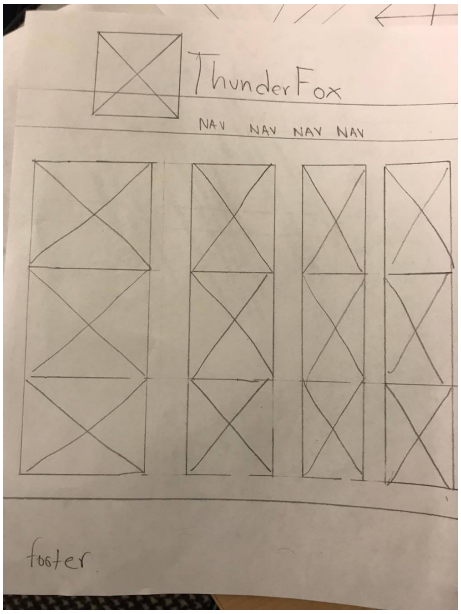
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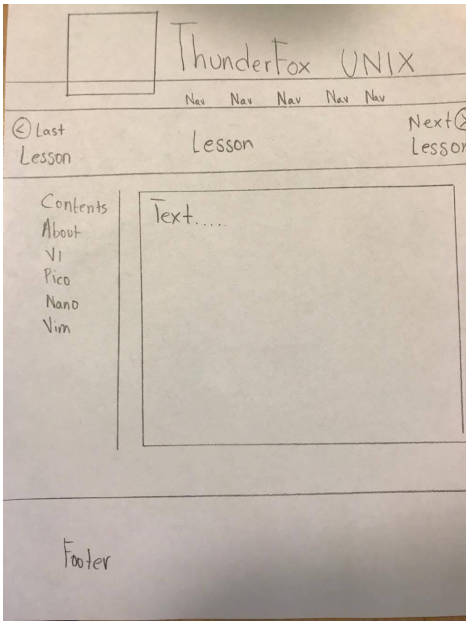
ThunderFox UNIX
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About
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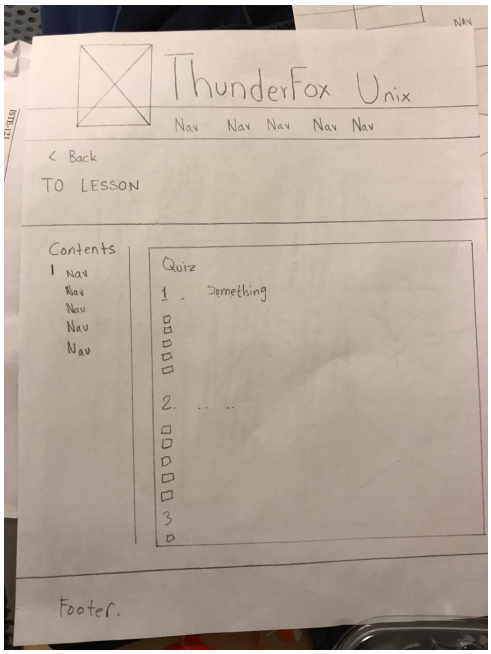
Pico
Nano
Vim
Text....
Footer


ThunderFox Unix
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Nav
Quiz
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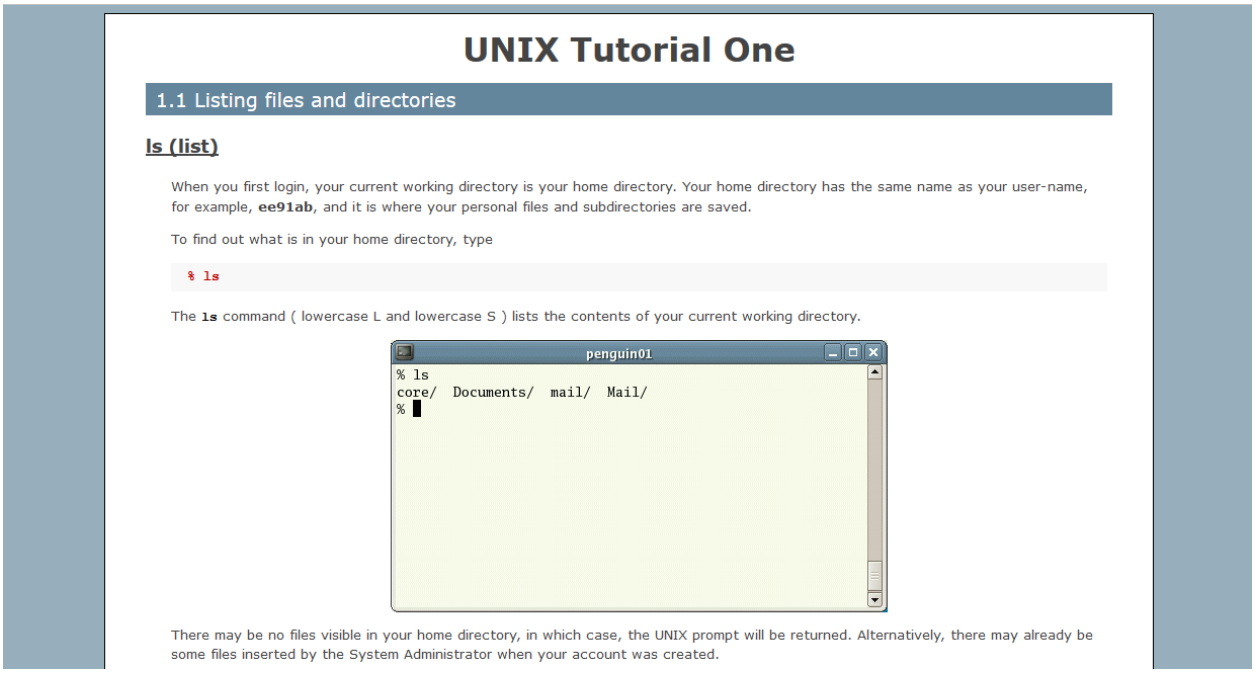
3
Footer.

Appendix A: Competitive Analysis

Site 1

http://www.ee.surrey.ac.uk/Teaching/UNIX/



UNIX Tutorial One

1.1 Listing files and directories

ls (list)

When you first login, your current working directory is your home directory. Your home directory has the same name as your user-name, for example, **ee91ab**, and it is where your personal files and subdirectories are saved.

To find out what is in your home directory, type

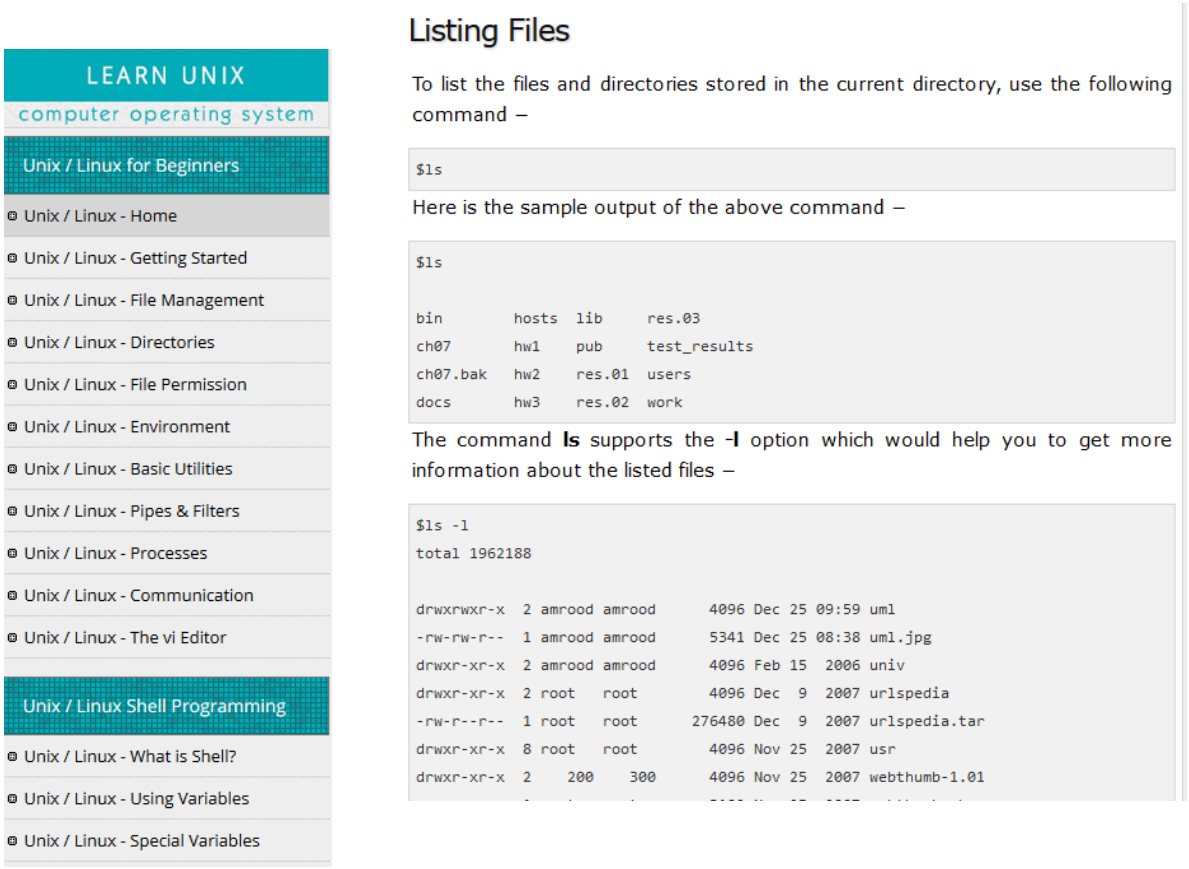
```
% ls
```

The **ls** command (lowercase L and lowercase S) lists the contents of your current working directory.

There may be no files visible in your home directory, in which case, the UNIX prompt will be returned. Alternatively, there may already be some files inserted by the System Administrator when your account was created.

Site 2

https://www.tutorialspoint.com/UNIX/



LEARN UNIX

computer operating system

Unix / Linux for Beginners

- Unix / Linux - Home
- Unix / Linux - Getting Started
- Unix / Linux - File Management
- Unix / Linux - Directories
- Unix / Linux - File Permission
- Unix / Linux - Environment
- Unix / Linux - Basic Utilities
- Unix / Linux - Pipes & Filters
- Unix / Linux - Processes
- Unix / Linux - Communication
- Unix / Linux - The vi Editor

Unix / Linux Shell Programming

- Unix / Linux - What is Shell?
- Unix / Linux - Using Variables
- Unix / Linux - Special Variables

Listing Files

To list the files and directories stored in the current directory, use the following command –

```
$ls
```

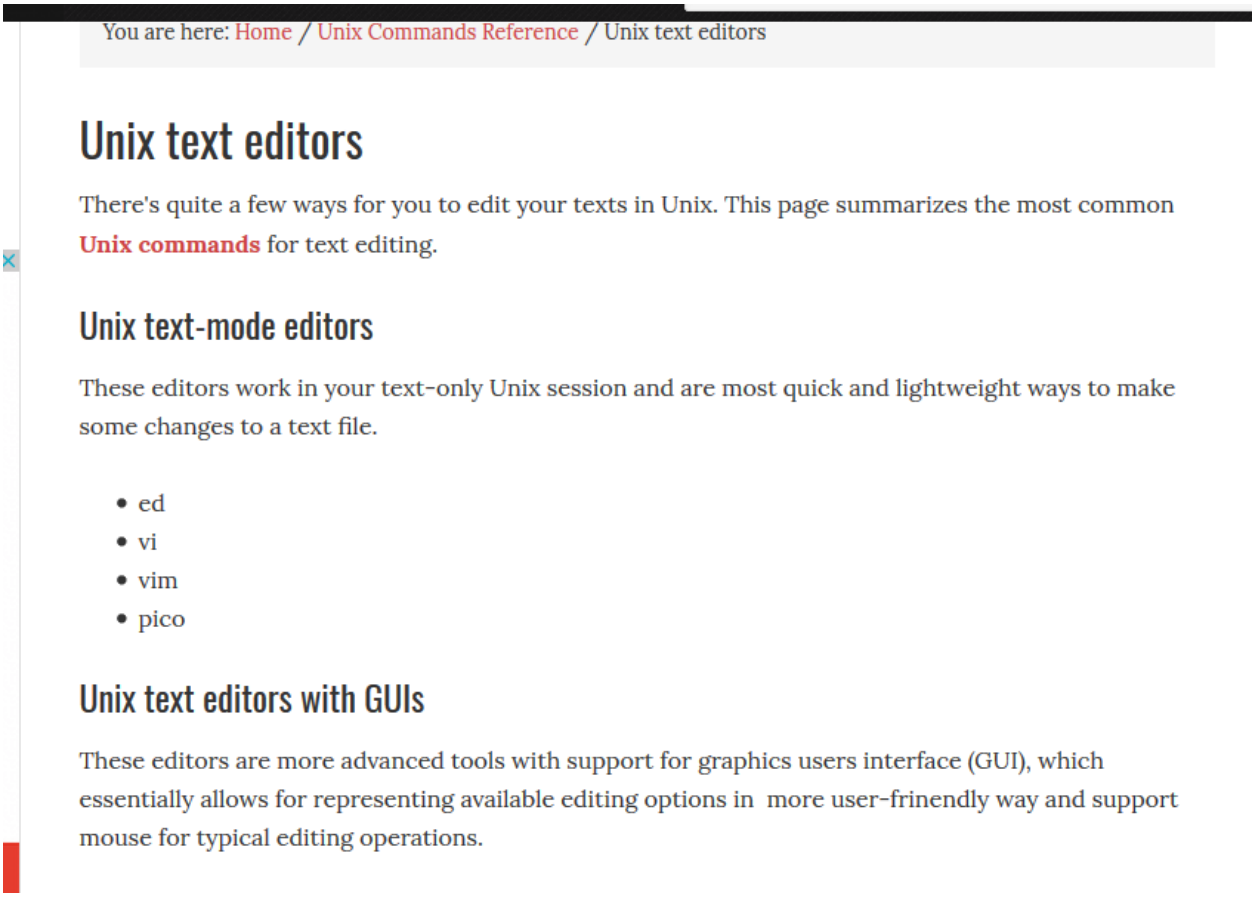
Here is the sample output of the above command –

```
$ls

bin         hosts  lib      res.03
ch07        hw1    pub      test_results
ch07.bak    hw2    res.01   users
docs        hw3    res.02   work
```

The command **ls** supports the **-l** option which would help you to get more information about the listed files –

```
$ls -l
total 1962188

drwxrwxr-x  2 amrood amrood      4096 Dec 25 09:59 uml
-rw-rw-r--  1 amrood amrood      5341 Dec 25 08:38 uml.jpg
drwxr-xr-x  2 amrood amrood      4096 Feb 15  2006 univ
drwxr-xr-x  2 root   root        4096 Dec  9  2007 urlspedia
-rw-r--r--  1 root   root      276480 Dec  9  2007 urlspedia.tar
drwxr-xr-x  8 root   root        4096 Nov 25  2007 usr
drwxr-xr-x  2    200    300      4096 Nov 25  2007 webthumb-1.01
```

Site 3



https://www.unixtutorial.org/

Site 4

http://people.ischool.berkeley.edu/~kevin/UNIX-tutorial/toc.html

2. Logging in, logging out

Commands covered in this section: ***whoami, passwd, logout***

Since UNIX supports multiple users at one time, you must identify yourself to the system before you can begin using it. This process is called *logging in*. When you connect to a computer running UNIX (often called a UNIX *host*), you are asked to provide two pieces of information in order to log in: your *username* (also called a *login name)*, which is your identity on the system, and your *password*, which proves (or at least improves the likelihood) that you are indeed who you say you are. Throughout the tutorial, we will assume your username is "natasha" and you are logging into a UNIX host called "peabody.wossamotta-u.edu."

Exercise 2.1

Connect to a UNIX host on which you have an account. If you are connecting from a machine running Mac OS X or Linux, you'll need to launch the Terminal application and use the *ssh* command to connect as shown in the example below. (If you're running Windows, you'll need to download and install an SSH client such as PuTTY.) Of course, you'll need to substitute your actual username and the hostname of the computer you want to connect to in place of "natasha" and "peabody.wossamotta-u.edu," respectively.

```
$ ssh natasha@peabody.wossamotta-u.edu
natasha@peabody.wossamotta-u.edu's password: <your_password_here>

Last login: Fri Feb 14 08:21:43 from bullwinkle.wossamotta-u.edu
Fedora Linux 3.6.11-4.fc16.x86_64 #1 SMP Tue Jan 8 20:57:42 UTC 2013

Welcome to peabody.wossamotta-u.edu!  Report any problems by sending e-mail
to help@wossamotta-u.edu.

** NOTE: peabody will be down from 10:00 am to 11:00 am
**       on Saturday, February 22 for a hardware upgrade.

$
```

Site 5

http://www.open-of-course.org/courses/course/view.php?id=45

UNIX Tutorial Two

2.1 Copying Files

cp (copy)

`cp file1 file2` is the command which makes a copy of **file1** in the current working directory and calls it **file2**

What we are going to do now, is to take a file stored in an open access area of the file system, and use the `cp` command to copy it to your unixstuff directory.

First, `cd` to your unixstuff directory.

```
% cd ~/unixstuff
```

Then at the UNIX prompt, type,

```
% cp /vol/examples/tutorial/science.txt .
```

(Note: Don't forget the dot (**.**) at the end. Remember, in UNIX, the dot means the current directory.)

The above command means copy the file **science.txt** to the current directory, keeping the name the same.

(Note: The directory **/vol/examples/tutorial/** is an area to which everyone in the department has read and copy access. If you are from outside the University, you can grab a copy of the file here. Use 'File/Save As..' from the menu bar to save it into your **unixstuff** directory.)

Site 6

https://www.guru99.com/UNIX-linux-tutorial.html

Syllabus

Linux Fundamentals

Tutorial	Introduction to the Linux Operating System
Tutorial	Linux Distributions & Installation
Tutorial	Linux Vs. Windows
Tutorial	Terminal V/s File Manager

Getting Started

Tutorial	Must Know Linux/Unix Commands
Tutorial	File Permissions in Linux/Unix

Advance Stuff!

Tutorial	Redirection in Linux/Unix
Tutorial	Linux/Unix Pipes, Grep & Sort Command
Tutorial	Linux - Regular Expressions

In this tutorial, you will learn-

The concept of **permissions** and **ownership** is crucial in Linux. Here, we will discuss both of them. Let us start with the **Ownership.**

Site 7

https://www.cs.sfu.ca/~ggbaker/reference/UNIX/

2.1 Copying Files

cp (copy)

`cp file1 file2` is the command which makes a copy of **file1** in the current working directory and calls it **file2**

What we are going to do now, is to take a file stored in an open access area of the file system, and use the `cp` command to copy it to your unixstuff directory.

First, `cd` to your unixstuff directory.

```
% cd ~/unixstuff
```

Then at the UNIX prompt, type,

```
% cp /vol/examples/tutorial/science.txt .
```

(Note: Don't forget the dot (`.`) at the end. Remember, in UNIX, the dot means the current directory.)

The above command means copy the file **science.txt** to the current directory, keeping the name the same.

(Note: The directory **/vol/examples/tutorial/** is an area to which everyone in the department has read and copy access. If you are from outside the University, you can grab a copy of the file here. Use 'File/Save As..' from the menu bar to save it into your **unixstuff** directory.)

Appendix B: Content Inventory

Jake

- Most useful commands
- Advantages of UNIX
- Disadvantages of UNIX
- How widely used is UNIX
- Range of uses
- Command line interfaces
- Shell Scripting
- tar balls

Yan

- History of UNIX
- Versions of UNIX
- Pioneers
- UNIX Standards
- Components

- The Kernel
- The Shell
- Directory Structure
- File permissions
- Text Editors
- Vi
- Vim
- Pico
- Quizzes
- Video Tutorials

Bakari

- tutorials on individual UNIX commands
- references for terminology/commands
- quizzes
- sequential nav for tutorials and quizzes (next/back buttons)
- tutorials for groups of UNIX commands
- links to other sites that cover a relevant topic that's outside our site's scope
- different tutorials for terminal/bash/putty users, because there'll be some differences in UI
- screenshots of UNIX screens/commands/operations
- direct links to quiz from tutorial and vice versa
- quizzes and tutorials with corresponding names

Abhi

- Home will be simple and will have a lot of white space and will give a basic overview of the website.
- Color combinations are going to be simple and will use different shades of the same color in different parts of the site.
- Global nav will consist of 5-8 links which will take you to different aspects of learning UNIX.
- While hovering over a certain nav menu it will open a dropdown menu for the specific topics which are covered in the larger topic.
- Each page should consist of one topic and have several examples to explain to the user
- Vector diagrams instead of images and examples.

Louis

- Command Reference
- Historical Content
- Flavors of UNIX/Linux
- Inner Workings of an OS
- Advanced command section
- Graphical interface installations
- Graphical interface tutorials