

程序代写代做 CS编程辅导



Introduction to Linux

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C#

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- C# development driven more by Microsoft's business needs to revitalize Windows desktop application development against perceived competitive threats like Java
 - designed to maximize application developer productivity
- Microsoft origins, so
 - usually targeted towards Windows
 - benefits from the .NET framework
- High-level programming language
 - originally very much like Java, now very different



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C#

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- High-level programming language
 - object-oriented – driven with large systems libraries
- Provides a managed memory model that adds a higher level of abstraction & protects programmers
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 - does a lot of what could be done in C for you e.g. memory management
 - simpler syntax is less demanding (& error prone) & has a shallower learning curve for new programmers
 - adds convenience & improves development times
 - complicates access to lower level APIs
- Similarities between C & C# are few
 - syntax is similar, but languages very different behind the scenes



C#

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- Provides a number of features to make it easier to code
 - dynamic typing, implicit variable declarations, & local functions
 - error handling (type checking, bounds checking, uninitialized variable checking)
 - exception handling & garbage collection
- Generally interpreted - most commonly compiled into byte-code (not machine code) & executes on a virtual machine that converts into machine code on the fly



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C#

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- Higher level languages are not efficient
 - C# code is lower & useless for high performance scientific computing
- C# remains a common choice for internal/enterprise applications & games development, but is less common for commercial software
- Rapid client application development & high performance Server development



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commercial software

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What about C?

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- Low-level programming language



- easier to understand and implement than object oriented programming
- usually compiles to assembly language
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- performs almost as efficiently as assembly code
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- provides base level access to memory, & requires very little runtime support
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- lets you do almost anything provided correct syntax
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- can cause some real damage to the OS

What about C?

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- Complete binary data transparency
- Consecutive bytes placed consecutive in memory
 - an int, followed by a double, followed by a char, is exactly 15 bytes long



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- Data allocated in a function gets allocated on the stack exactly as you declare it (usually in the same order)
 - memory layout of data is completely under your control

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Lecture aims

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- To introduce Unix/Linux Operating System.



Lecture Objectives

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- To examine the file & directory structures used.
- To look at a few basic Unix commands.

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- Practical in Linux command line

The UNIX Operating System

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- Common Operating System – can be found on Sun, Vax computers as well as being ported into Intel based computers.
- UNIX has been around since 1969. At one stage it was available free.
- The entire source code was once available...
- Most commonly found as a scientific/engineering Operating System, but...



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Commonly found on 'servers' to, for example,
the web

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- because it handles concurrency (pseudo concurrency) easily

History

Bell labs (AT&T)

1969 Multics -

1972 -

Version 6

Version 7

System V:

Release 1

Release 4

1999

There are 2 'main' versions of UNIX, referred to as

System V

BSD

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slow, limited interaction.



initially written in assembler and 'B'.

then in C

1975 – University only

1979 – first sold commercially

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1983 – improved commercial appeal

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1989 - 1.2 million Unix installations

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Linux 2.2 kernel released.

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- Bell labs or AT&T UNIX

- Berkley UNIX (mostly universities)

Why UNIX?

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- It is a ‘Real’ Operating System – supporting virtual memory management, multitasking, multiuser, etc.
- Probably only OS available from several sources
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- Almost completely written in a high level language. Thus it is portable to new processors (if they support a compiler and OS to run it on).
Used on micros to supercomputers .
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- Resource requirements are relatively small & don’t require very specialised hardware
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BUT



- UNIX has been around for some time & much of it 'evolved'.

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- Is UNIX really a business OS? It was never intended to be

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- Although UNIX is available from many sources, each source is slightly different



- It is not a real-time OS
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- Machines like ICL29000 hardware & the VME Operating System were designed around each other
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– > better optimised system?

The ‘Onion’ Model

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H/ware

Kernel

Shell
(interface)

Tools &
Application

Tools

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- **Tools and applications**

There are hundreds of tools available to users. Email, word processing, business applications, or programming.



- Account and invoicing of system users

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- Computer aided instruction

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- On line manual (very comprehensive)

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- Programme debugger

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- Pattern scanning and processing language

- Languages – C, Basic, FORTRAN

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- System status info

- Much file management, inc encryption & database

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- and more – a vast software library

Interfaces

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Most versions work with a windowing system (GUI)



- Every Unix/Linux system has a command-line interface
- Command-line more flexible for advanced use
 - programmes used together in combinations impossible under windows
- Shell scripts automate jobs which would have to be done manually repetitively using windows
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- Text-based interfaces easier than GUIs for sight- & hearing-impaired users

Linux

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- Linux is a free Unix-type OS
- It is a clone of Unix
- Linux supports most of the popular Unix software



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- Linux is mostly System V, mostly BSD compatible & mostly POSIX compliant

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Linux

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It has all the features you would expect in a modern fully fledged Unix:



- Multitasking WeChat: cstutorcs
- Virtual memory Assignment Project Exam Help
- Shared libraries Email: tutorcs@163.com
- Proper memory management QQ: 749389476
- TCP/IP networking <https://tutorcs.com>

Linux

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- Linux is easily portable to most general-purpose 32-bit architectures as long as they have



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- a paged memory management unit
(PMMU)

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- a GNU C-compiler
- GNU - recursive acronym for "GNU's Not Unix"

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Linux

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- Much of Linux is really an aggregation of hundreds of independently developed utilities that make up the typical Unix system
- Linux offers a windows-based shell interface, commonly known as X-Windows or simply as X



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Linux

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- Unlike Windows 10, there's no single version of Linux
- Linux distributions take the Linux kernel
- Combined with other software like the GNU core utilities, X.org graphical server, a desktop environment, web browser, etc
- Each distribution unites some combination of these elements into a single OS you can install



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Which Linux am I running?

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- The *uname* command lets you check some basic information about the copy of Linux you're running:
 > *uname -a*
- will display all the information, including the Linux release and CPU information

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What is Debian?

- The [Debian Project](#) is an association to create a free OS using the Linux kernel
- Most of the basic tools come from the GNU project - usually GNU/Linux
- GNU/Linux - a complete Unix-like operating system
- Debian comes with more than 50,000 packages



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Ubuntu

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- Ubuntu is a cross-platform, open-source OS based on Debian
- Ubuntu builds on the Debian architecture & infrastructure, but there are important differences
- Ubuntu is a good place to start for former Windows users



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What do you need to know?

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- Print your working directory
- Change directory
- Create a file & directory
- Redirect the output of a file
- View the full/partial contents of file
- Search for something
- Delete files/directories
- Run a programme in the background
 - Then end that process



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root super user

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- In a multi-user environment, you must be able to protect files from other users, etc



- There is a single super user-id called *root* which has the power **WeChat: cstutors** **To do anything**

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- Normally the *root* user prompt is different e.g. #

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Linux naming convention

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- A name may be up to 14 characters long
 - recent versions increased this to 28 characters
- A name cannot contain spaces
- Any other characters may be used
- However, because a number of characters have special uses, it is suggested that only the following are used:
 - Lowercase & uppercase letters (a-z)
 - Numbers (0-9)
 - Underscore (_), period(.) and comma (,)
- Linux is case sensitive – Readme, readme, ReadMe, readMe are all different files



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Naming conventions

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- .c - 'C' program source file
- .h - header file
- .o - compiled and assembled code (object file)
- .ps - Postscript source code
- .sh - Shell programme
- .z - compressed file using pack command
- .Z - compressed file using compress compile



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Permissions

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-rw-rw-r--	1 pbg	31200	Sep 3 08:30	intro.ps
drwx-----	5 pbg	512	Jul 8 09:33	private/
drwxrwxr-x	2 pbg	staff	512	Jul 8 09:35
drwxrwx---	2 pbg	student	512	Aug 3 14:13
-rw-r--r--	1 pbg	staff	9423	Feb 24 2003
-rwxr-xr-x	1 pbg	staff	20471	Feb 24 2003
drwx--x--x	4 pbg	faculty	512	Jul 31 10:31
drwx-----	3 pbg	staff	1024	Aug 29 06:52
drwxrwxrwx	3 pbg	staff	512	Jul 8 09:35

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Files and directories

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- Any file or directory has three sets of access permissions - r, w, x



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- Any file has 3 classes of people who can access it:
 - Owner
 - Group
 - Other
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- u (for user)
g (owners group)
sometimes rest,
world, etc

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- The *root* user  has all settings and can access any file
- Groups can be set up by the system administer
 - to find out which ones you belong to, type **WeChat: cstutorges Assignment Project Exam Help**
 - > *groups* Email: tutorcs@163.com
- You can also determine which groups another user is a member of 
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E.g. *groups martin* (or other username)

Access permissions

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Ordinary file

r (read)

can look at contents of
a file

w (write)

can change or delete
contents

x (execute)

can execute the file

Directory

Allows listing of files

Create/move/delete files in

the directory

Can search the directory

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Access permissions

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-rw-r----	1	ro		em	3953	Jan 12 2018	martin4
(1)	(2)	(3)	(4)	(5)	(6)	(7)	

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- (1) File/directory permission bits
- (2) Link count
- (3) User name of person who owns the entry
- (4) Group that owns the file/directory
- (5) Size (in bytes)
- (6) Date file last modified
- (7) Name of file or directory

Access permissions

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- You can change access permissions of files and directories you are using *chmod*



+ = add permissions

- = remove permissions

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chmod go +rw martin4

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can also use Email: tutorcs@163.com

r w x
4 + 2 + 1

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chmod nnn filename

e.g. *chmod 740 martin4*

Directories

Directory structures are separated by

/ (forward slash)



.

refers to your current directory

..

refers to the parent directory

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cd Assignment Project Exam Help
 } (DOS

mkdir copied

rmdir Email: tutorcs@163.com
 } from Unix)

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From other parts of the system

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your home directory can be referred to as ‘~’

cp bsctemp ~/bsctemp

Directories

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- Working directory or current directory



- To find out what are in the system

`pwd`

(Print Working Directory)

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`cd`

should take you to your home directory

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(but takes you to sec204)

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- Everything in your home directory you own

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File structure

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- Hierarchical structure
 - Parent directory written as “/”
 - Subdirectories like bin, etc, tmp & usr – usually containing specific kinds of system files

• /bin	WeChat: cstutorcs programmes
• /etc	Assignment Project Exam Help configuration files
• /home or /user	Email: tutorcs@163.com home directories of users
• /usr	QQ: 749389476 application programmes
• /var	variable files (admin, mail, https://tutorcs.com spool)
• /dev	devices e.g. terminal, printer, drives



Useful files

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- *.login*
- *.logout*
- *.cshrc*
- *.plan*
- *.profile*



(executes when you log in)
(executes when you log out)
(executes when you invoke a
C shell)

(Assignment Project Exam Help
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little message to yourself)

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Full & Relative Pathname

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- **Full Pathname**

List each directory starting from /, down to the file itself. Each directory and the filename must be separated



OR

- **Relative Pathname**

If the file is in a directory near the Working Directory, a relative path may be used

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- If the Working Directory is /home/martin, the file myfile.c in that directory may be referred to by:

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Full Pathname: /home/martin/myfile.c

Partial Pathname: myfile.c

Full & Relative Pathname

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- If the Working Directory is /home/paul
- myfile.c under directory /home/martin may be referred to



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Full Pathname: /home/martin/myfile.c

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Relative Pathname: ../../martin/myfile.c

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Basic Command Syntax

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- Most commands follow a consistent syntax, of the form:



command [options] [arguments]
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- [options] ~~Assignment Project Exam Help~~ switches that modify the function.
~~Email: tutorcs@163.com~~ Options usually begin with a ~~-~~, such as "-f".
- [arguments] ~~QQ 749389476~~ (not always) the name of a file or directory to perform the operations on.
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List command

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- *ls* list
- *ls -alg* (all files using format + group id)
- *ls -d* (directory)
- *ls -t* (time order)
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- *ls -r* (reverse order)
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- *ls -l a** Email: tutorcs@163.com
- *ls -lt martin?* QQ: 749389476

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Metacharacters

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- ? one character compare
- * multiple chara compare
- [] list of comparat values
- [-]range for comparison
- [!]negative comparison



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!! Execute the previous command

!nn Execute command from history

!-n Execute the command that was executed n
commands ago

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The on-line manual

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- To get help on any part of the system
 - use **man** or



man 1 ls WeChat: cstutorcs
section number and title

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- When the manual entry displays more than one screen, press the space bar for more, or CTL/C to stop, or q to quit

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Sections of the manual

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1. Commonly used commands & tools
2. System calls (written in C) Unix kernel). Assumed
3. Higher level subroutines – again in C
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4. Special device files. Typically characteristics of
disc drives, etc Assignment Project Exam Help
5. File formats – of system files Email: tutorcs@163.com
6. Games QQ: 749389476
7. Misc file system hierarchy Text formatting,
macro pages, character sets, etc
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8. System admin guide



on-line manual

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- Some commands are in several sections of the manual

sleep nn



Pauses your process to sleep for nn seconds

- Can be used as a ~~WeChat, tutorcs~~ command
or ~~Assignment Project Exam Help~~
- A call to the operating system from within a programming language
– Found in sections 1 and 3
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- ‘Sleep’ uses the OS functions ‘gettimer’ & ‘sigpause’, which have entries in section 2 of the manual
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Finding files

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- Finding files using the find programme

find directory options [-print -exec -ok]



find . -type f -name "myfile"

- Look in working directory (& all subdirectories) for files with names starting 'myfile'

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find . -type f -mtime -4

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- Look for all files created or modified in the last 4 days

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find / -name "[a-zA-Z]"

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Other commands

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- Linux has the locate programme
locate alpha
- date
- who
- whoami
- passwd



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who is on the system

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who are you logged in as

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change your password

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- cat filename (list a file - no pauses)
- more (pg) file (list a file - with pauses
- use for large files)



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- tail filename (list the last few lines)

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Processes

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- To display all the processes use `ps`

`ps -`



- Displays the name, PPID (parent process id), start time & full command line

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- To stop a process use `kill` – need to know the process id

`kill 1481`

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`kill process 1481`

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- Some processes will not terminate with a normal `kill` & require a `kill -9` absolute to terminate them

`kill -9 1481`

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