----- lecture 10
--Automata
Example 1:
{u,d}
Example 2: going to uni and study and return
o: leave home
b: bike
w: walk
s: study
r: return
--What is a language?
Set of strings on an alphabet
--Regular expression
E | E+E | EE | E*
-- Equivalence of regular expressions with Automata
web site that converts

-- Lots of Syntactic sugar:
$ grep "12345" samplefile

^something all lines starting with something
 $ ls -al | grep "^d"
 $ ls -al | grep "^drw"
 $ grep "^Art" samplefile

-i for ignore case
-v for inverse match   i.e. cases that we dont want to match
-n line number
 $ grep -i "art" samplefile
 $ grep -v "art" samplefile
 $ ls -al | grep -v "^drw"

$ for end of line
grep "punishment." samplefile
what does this do?
$ ls .. | grep "sh$"

what does this do?
$ grep -n "^$" samplefile
Empty lines with their number

. for exactly one
*grep ".ion" samplefile

the followings are clear A-Z a-z 1-8

[aeiou] means a or e or i or ...
what is this ?
$grep "19[5-8][0-9]" samplefile

*   0 or more

grep -E “the*” samplefile
+ one or more
? 0 or 1
{5} exactly five
{1,3} means 1,2 or 3
what does this do?
[0-9]{1,3}\.[0-9]{1,3}\.[0-9]{1,3}\.[0-9]{1,3}
You need to use extended grep by flag -E or use egrep which is shorthand for grap -E
$ grep -E "[0-9]{1,3}\.[0-9]{1,3}\.[0-9]{1,3}\.[0-9]{1,3}" samplefile

.* any number of characters
$ grep -E "1.*" samplefile
search for email with yahoo in it
$ grep -E "@.*yahoo" samplefile

ATTENTION [^chars]: pay attention to difference between “^xyx” and “[^xyz]”
first one says start with x second one says anything but x or y or z
$ ls -al | grep "^d"
$ ls -al | grep "[^d]"
or
egrep "^Article" samplefile
 egrep "[^Article]" samplefile
or
[^a-z] anything except lowercase

– something helpful about grep
You can include and exclude files in your grep. For example imagine you are looking for the word customer in your .java files
$grep -i “customer” . -r –include *.java

There are lots of cheat sheets that you can use such as http://regexpr.com/cheatsheet/

--- cut
grep cuts line-by-line
imagine we want to cut by column
- look at sample file and print peoples name and their
cut -d" " -f 1,3 sample

--would that work if i add a small space between entries? experiment
somedata has a small csv list of uk-500 companies.
print firstname lastname and address.
$ cut -d"," -f 1,2,4 somedata

--- exit status
Every command that is executed return back a value 1 if failed and 0 if succeed. You can get it by $echo $?

--- write about if clauses
see
l10-ifthen.sh

--How can you get rid of "cp: cannot stat ..."

(Hint: bit bucket)
l10-ifthenv2.sh

----using if with numbers
see l10-ifelsenumbercomparison.sh

--comparison operators are
-eq equal to
-ne not equal to
lt less than
-le less than or equal to
-gt greater than
-ge greater than or equal to

ATTENTION: watch out for space after [and before]

--Exercise: write a program to check for a single character input, i.e. reads an input and prints "single character" message
if input is single character.
Hint pipe to wc -c why?
Hint: does it work? Have you considered carriage return? what?

You also have logical operators such as
-a for and
-o for or
see l10-logicaland.sh
Exercise: write a program to extend the previous exercise and check for a single character and then if the character
is a,b or c prints the message "abc" and otherwise print the message "notABC".

---- working with files
- checking somethis is file not a directory
$ if [-f sample]; then echo "file exist"; fi

-- there are a whole bunch of file operations:
-s file exists and is not empty
-f file exists and is not a directory
-d directory exists
-x file is executable
-w file is writable
-r file is readable
-z File has 0 character return t

Exercise: write a script that checks if a file exists and is writeable. Print appropriate messages.

Exercise: write a program to add index.html file into every directory that does not have one.