1 Instalation of Linux

link `https://msekce.karlin.mff.cuni.cz/~dolejsi/Vyuka/NS_source/Linux/index-install.html`

2 Basic commands of Linux (from the `command lines|`)

- `name/codes/integrals/data/` – structures of directories `/`
- `pwd` – return actual directory
- `mkdir` – create a (sub-)directory
- `rmdir` – remover a (sub-)directory
- `cd` – changes the directory
- `ls` – list the files, option `ls -l`
- `rm` – remove a file (or directory), option `rm -r` - DANGEROUS !
- `cp file1 file2` – copy a file
- `mv file1 file2` – rename a file
- `mv file1 dir2` – move a file to directory
- `~/` – home directory
- `touch` – create a file
- `less` – list the file

- `more` – list the file
- `man` – list the help (manual) for the given word

Try the following:

```
> pwd
> ls
> ls -l
> mkdir Numsoft
> ls -l
> cd NumSoft
> pwd
> ls
> mkdir tutotrial1
> cd tutorial1
> emacs file1 &
> ls -l
> cp file1 file2
> ls -l
> mv file2 ../
> ls -l
> ls -l ../
> cd ..
> pwd
> ls -l
> rm file2
```

3 Installation of libraries in Linux

For the purposes of this lecture, we will need

- a Fortran 90 translater, the good choice is `gfortran`
- suitable text editor (e.g., `gedit`, `emacs`)
- software for visualization `gnuplot`

First, update of the instalation of the system:

```
sudo apt-get update
```

Your Linux password is required.

Installation of packages, e.g., of `gedit`, try

```
sudo apt-get install gedit
```

similarly for gnuplot

```
sudo apt-get install gnuplot
```

4 gfortran on Linux

Try

```
sudo apt-get install gfortran
```

or directly from `https://gcc.gnu.org/wiki/GFortranBinaries#GNU.2BAC8-Linux`

Simple code `test.f90`

```
program test
  print*,'Hello world!'
  write(*,*) 'Hello world!'
!  write(22,*) 'Hello world!'
end
```

translation of the program `test.f90` from the command line:

- `gfortran test.f90 -o test` – single precision
- `gfortran -fPIC -fdefault-real-8 test.f90 -o test` – double precision
- `./test` – running of the code from the command line

```
program summ
  real :: sum
  integer :: i, n

  sum = 0.
  n = 100

  do i=1, n
     sum = sum + i
  enddo
  print*,'End after ',n,'-steps,  sum = ', sum

end program summ
```

Use of `gnuplot`

```
terminal>  gnuplot

gnuplot> plot sin(x) w l
gnuplot> plot sin(x) w l, cos(x) w l
```