

# mrunc tutorial

- on GNU/Linux open up a terminal and type:

- ```
$ hostname  
$ date
```

- what do these programs do?



- mrunch (**m**ultiple **r**un) is a program which allows you to run a program on multiple machines
- there is some [documentation](http://floppsie.comp.glam.ac.uk/csn/csn.html) `<http://floppsie.comp.glam.ac.uk/csn/csn.html>` under sections 8, 9 and 10
- it is hoped that this tutorial will also bootstrap your knowledge

## Tiny example

- suppose we have a program `hostname` which we want to run on two different machines in parallel
  - we could use the command line program `ssh` to achieve this end, but it involves much typing and after the *n*th time of running, becomes tedious
- we can use `mrunc` instead, but we firstly need to create a `par` file
- in our tiny example we will call this filename `hostname.par`
- create a file called `hostname.par` using `gedit`

## Contents of hostname.par

```
#  
# example par file to run hostname on two machines  
#  
par  
    processor 0 (localhost) [::] hostname ;  
    processor 1 (localhost) [::] hostname ;  
end  
  
timeout 2h ;  
# terminal 0 1 ;
```

■ now open up a terminal and type

## Contents of hostname.par



```
$ mrun -f hostname.par
Password:
press the <enter> key to terminate
<processor 0>:
<processor 0>:fred@j210-03:$ hostname
<processor 0>:j210-03
<processor 0>:fred@j210-03:$
<processor 1>:
<processor 1>:fred@j210-03:$ hostname
<processor 1>:j210-04
<processor 1>:fred@j210-03:$

halting and tidying up.. done
```

## Contents of hostname.par

- we notice that
  - `mrunc` will prompt us for a password, you need to enter your GNU/Linux password here
  - you need to press the enter key to terminate `mrunc`
  - `mrunc` randomly chooses any machine which is available from the chosen pool
  
- we stipulated we wanted any localhost processor by the field `(localhost)`
  - try changing this to `(x86_64)`
  - does it still work?

## Contents of `hostname.par`

- the field `timeout 2h` says to stop running after 2 hours and could be replaced by `timeout 5m` if appropriate
- comments in the `par` file are the `#` character, anything to the right of this is ignored

## Contents of hostname.par


- try uncommenting the last line, ie remove the ' #' on the last line
- run the program again
- ```
$ mrun -f hostname.par
```
- what happens?
- now change the par file to execute the program date and run mrun again



## Using the for statement in a par file

- now create a new file `hostname2.par`

## Contents of hostname2.par



```
par
  processor 0 (localhost) [::] hostname ;
  for i in 1 to 6 do
    processor ({i}) (localhost) [::] hostname ;
  end
end

timeout 2h ;
terminal 0 3 4 ;
```

## Contents of hostname2.par

- run this via:

- ```
$ mrun -f hostname2.par
```

## Contents of hostname2.par

- notice that the `{i}` expands to the value of `i` in the for loop

- now change the contents of the file to

- ```
par
  processor 0 (localhost) [::] echo 0 ;
  for i in 1 to 6 do
    processor ({i}) (localhost) [::] echo {i} ;
  end
end

timeout 2h ;
terminal 0 3 4 ;
```

- the program `echo` just prints to the console

- run this new par file



## Contents of hostname2.par

- try running `mrunch`

- `$ mrunch --help`

- find out what all the other options do, hint read the online documentation mentioned at the top of this tutorial

### Example of mrunch being used to coordinate a game

- mrunch spawns 8 bots which connect to the doom3 engine and follow the human player around the map
- mrunch in this example also spawns 8 terminals and the output of each Python bot is isolated in a separate window

## Example of mrun being used to coordinate a game

- `mrun example` `<http://floppsie.comp.glam.ac.uk/download/avi/eight-python-bots-dijkstra-routing-algorithm.mp4>`