Arithmetic calculations.

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Contents

Discussion of homework

- Copy all files from the directory `/tmp`, that are readable for you, to the compressed archive.

```
cd /
```

```
find ./tmp -type f -readable 2>/dev/null > $HOME/list.txt
```

```
tar cvzf $HOME/a.tgz -T list.txt    # Linux
rm $HOME/list.txt
```

- Verify, that the content of the archive is correct.

```
tar tvzf $HOME/a.tgz
```

- Create the new directory `$HOME/tmp-backup`. Restore all date from the previous archive to this directory.

```
cd $HOME
tar xvzf a.tgz
```

```
mv tmp tmp-backup
```

Incrementing variable values

- How to increment the content of the shell variable `max`?

```
export max=0;
```

  - Incrementation by command `expr`

```
max=$(expr $max + 1)
```

  - Incrementation by shell using `(( ))`

```
max=$((max+1))
((max=max+1))
((max++))
```

  - Incrementation by shell using `let`

```
let max=max+1
let max++
```

Calculations

- How to calculate the average size of regular files in the current directory?
  - Solution 1

```
ls -l | awk '  /^-/ {sum+=$5;c++} \
  END {print sum/c} '
```

    What happens when the current directory contains no file?

  - Solution 2

```
stat -c "%A %s" * | awk ' /^-/ {sum+=$2;c++;} \
  END{print s/c} '
```

    Is the problem solved?

  - Solution 3

```
stat -c "%A %s" * | awk ' /^-/ {sum+=$2;c++} \
  END  { if (c>0) { printf("%f\n", sum/c)} \
         else {print 0}} '
```

Calculations

- Login to the server `fray1.fit.cvut.cz`.
- How to calculate the average number of system calls per second?
  Hints:
  - Use command `vmstat -s` to get the number of system cals.
  - Use command `uptime` to get number of seconds from the last reboot.

```
calls=$(vmstat -s | grep calls | tr -dc '[0-9]')
```

How to get the number of minutes from last reboot?

```
$> cat ./minutes.bash
#!/bin/bash

RE='.* \([0-9]*\) day.*\([0-9][0-9]*\):\([0-9][0-9]*\).*'
echo \
 $(( $(uptime | sed "s/$RE/10#\1*24*60 + 10#\2*60 + 10#\3"/) ))
```

```
uptime=$( expr 60 \* $(./minutes.bash) )
```

```
echo $((calls/uptime))
```

```
echo $calls/$uptime | bc -l
```