

Shell variables, aliases, text editors.

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Discussion of homework

- Any questions about homework?
- Try the following commands and explain their behaviour.

```
echo PWD is $PWD
```

```
echo PWD\ is\ \ $PWD
```

```
echo "PWD_is_ $PWD"
```

```
echo "\$PWD_is_ $PWD"
```

```
echo '\$PWD is $PWD'
```

Discussion of homework

- Try the following commands and explain their behaviour.

```
cmd=who
```

```
echo cmd
```

```
echo $cmd
```

```
echo "$cmd"
```

```
echo '$cmd'
```

```
echo '$cmd'      # or echo "$($cmd)"
```

```
$cmd
```

- How can we protect output format of the command `who`?

Shell variables

- What types of shell variables can we distinguish and what is the difference between them?
 - *Local variables*: new child process will not inherit these variables from its parent process.
 - *Environment variables*: new child process will inherit these variables from its parent process.
- How can we temporarily create new local variable A and set its value to string "A_B_C"?

```
A="A_B_C"
```

- How can we temporarily create new environment variable B and set its value to string "X_Y_Z"?

```
export B="X_Z_Y"
```

- Can we omit the quotes? Why yes/no?

Shell variables

- How to print a value of the shell variable A?

```
echo "$A"
```

- Can we omit the quotes? Why yes/no?
- How to verify that the shell variable A is defined?

```
set | less          # use /A= inside less command
```

```
declare -p A
```

- How to verify that the variable B is an environment variable?

```
env | less
```

```
export -p | less
```

```
declare -p B
```

- How to destroy the shell variable B?

```
unset B
```

- How can we permanently define environment variable B?
Hint: see section "INVOCATION" in the manual page of bash.
 - Add the setting to the shell configuration file
~/.profile or ~/.bash_profile.
- What is the meaning of the following builtin shell variables?

```
PATH
USER
HOSTNAME
PS1
IFS
PAGER
```

Shell variables

- How to change a shell prompt of the current shell to the following value?

```
Hello >
```

```
PS1="Hello >_"
```

- How to change a shell prompt of the current shell to the following value?

```
user@hostname:pwd>
```

Where user is login name of the current user, hostname is name of the system, pwd is the current working directory.

```
PS1="\u@\h:\w>_" # working only in bash
```

```
PS1=' $USER@$HOSTNAME: $PWD> '
```

```
PS1=' $(whoami)@$(hostname):$(pwd)> '
```


Aliasing

- An alias is a shorthand notation to enable you to customise and abbreviate commands.
- Aliases are not exported to subshells.
- How to list all defined aliases?

```
alias
```

- How to list alias ll?

```
type ll
```

```
alias ll
```

- How to temporarily define new alias load, which means the number of all running processes in the system?

```
alias load='ps -e | tail -n +2 | wc -l'
```

- Can we omit the quotes? And why?

- How to destroy the alias `load`?

```
unalias load
```

- How to define an alias permanently? Hint: see section "INVOCATION" in the manual page of `bash`.
 - Add the setting to the shell configuration file `~/.bashrc`.

- Text mode
 - vi, vim (Vi IMproved),
 - nano,
 - pico,
 - joe,
 - emacs.
- Graphics mode
 - gvim,
 - leafpad,
 - gedit (from GNOME),
 - kedit (from KDE).
- Try these editors and select your favourite editor.

- In your favourite text editor create the shell script "s1.bash" with the following content

```
#!/bin/bash

echo "Hello_world"
date '+Today is %A'
```

- Change the access permission of the script by the following command
- Run the script by the following command

```
chmod 755 s1.bash
```

```
./s1.bash
```

Homework

- Set values 3 and 5 to local shell variables A and B, respectively.

```
A=3 ; B=5
```

- How to calculate the sum of the values of A and B by the shell and print the result to the standard output?

```
echo $((A+B))
```

- How to calculate the product of the values of A and B by the shell and print the result to the standard output?

```
echo $((A*B))
```

- Set octal value 10 and hexadecimal value F1 to local shell variables A and B, respectively. Hint: see manual page of bash.

```
A="010" ; B="0xF1"
```

- How to calculate the decimal sum of the values of A and B by the shell and print the result to the standard output?

```
echo $((A+B))
```

- Define local shell variables A and B in the following way

```
A="01010" ; B="AA"
```

- Assume that the variable A contains the binary number and variable B contains hexadecimal number.
- How to calculate the sum of the values of A and B by the shell and print the result like decimal number to the standard output?
Hint: see manual page of bash.

```
echo $((2#$A+16#$B))
```

Homework

- Create a subdirectory PS1_3 in your home directory by the following command

```
mkdir "$HOME/PS1_3"
```

- Change the current directory by the following command

```
cd "$HOME/PS1_3"
```

- Create files by the following command

```
touch {,}.{,.,a,b,c,d,e,f,A,B,C,D,E,F}\\  
{,.,a,b,c,A,B,C}.{txt,c,cpp,txt,C}
```

- Print the number of all files, that were created by previous command touch, on standard output.

```
ls -a | tail +2 | wc -l
```

- How many non hidden files (filename doesn't begin with the dot) with extension ".txt" have been created by command touch?

```
ls *.txt | wc -l
```

Homework

- How many files with extension ".txt" have been created by command touch?

```
ls *.txt *.txt | wc -l
```

- How many filenames contain string "aa" ?

```
ls *aa* | wc -l
```

- How many filenames begin with string "Fb" or "aC" ?

```
ls Fb* aC* | wc -l
```