

# Unix-like Operating Systems

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}`
```

```
$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 prints the number of all running processes in the system? (use pipe with ps, tail and wc)

```
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.
- How to calculate the sum of the values of A and B by the shell and print the result to the standard output?
- How to calculate the product of the values of A and B by the shell and print the result to the standard output?
- Set octal value 10 and hexadecimal value F1 to local shell variables A and B, respectively. Hint: see manual page of bash.
- How to calculate the decimal sum of the values of A and B by the shell and print the result to the standard output?

- 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.

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

# Homework

- How many files with extension ".txt" have been created by command touch?
- How many filenames contain string "aa" ?
- How many filenames begin with string "Fb" or "aC" ?