



## Linux Shell Script

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### Shell Script : Introduction

- Shell script is collection of commands along with programming constructs.
- Shell script syntax will differ from shell to shell.
- Shell scripts are interpreted by shell (interpreter - line by line).
- Speed is slower.
- Comments in shell script begin with # symbol.
- **echo command**
  - -e : enable escape sequences e.g. \n, \t, ...
  - -n : no newline after echo.
- **shebang line (#!/bin/bash)**
  - Line 1 of shell script should contain name of shell program which will execute that script followed by #!.
  - While running script on terminal (./demo01.sh), OS reads first line and load corresponding shell program, which in turn execute that shell script.



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## Shell Script : Variables

### • Shell variables

- Shell scripts are type-less. There is no concept of data types.
- Also no need to declare variables before using them.
- Assign value to variable
  - varname=value
- Read value from variable
  - \$varname
- Assign output of command to variable
  - varname=`command ...`
  - varname=\$(command ...)
- To perform arithmetic – expr and bc

### • Environment variables

- Few variables are initialized from values in the environment.
- Normally these variables are in uppercase to distinguish from user defined variables.
- Variables created depends on your personal configuration.
- e.g.
  - \$HOME – gives home directory
  - \$PATH – path of all executables
  - \$USER – gives user name
  - \$SHELL – gives which shell is currently running.



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## Shell Script : Conditions

- Test conditions and perform different actions based on those decisions.
- For checking conditions you can use following two syntaxes:
  - test condition
  - [ condition ]
- Condition types that can be used are of three types:
  - String comparison
  - Arithmetic comparison
  - File conditions

String Comparison	Result
str1 = str2	True if str1 and str2 are equal
str1 != str2	True if str1 and str2 are not equal
-n str	True if the str is not null
-z string	True if the str is null (empty)

Arith Comparison	Result
exp1 -eq exp2	True if equal
exp1 -ne exp2	True if not equal
exp1 -gt exp2	True if exp1 is greater than exp2
exp1 -ge exp2	True if exp1 is greater or equal exp2
exp1 -lt exp2	True if exp1 is less than exp2
exp1 -le exp2	True if exp1 is less or equal exp2

File Conditionals	Result
-e file	True if file exists
-f file	True if file is regular file
-d file	True if file is directory
-r file	True if file readable
-w file	True if file is writable
-x file	True if file executable



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## Shell Script : Control Structures

- if

```
if [ condition ]
then
    # ...
fi
```

```
if [ condition ]
then
    # ...
else
    # ...
fi
```

```
if [ condition ]
then
    # ...
elif [ condition ]
then
    # ...
else
    # ...
fi
```

```
if [ condition ]
then
    # ...
else
    if [ condition ]
    then
        # ...
    else
        # ...
    fi
fi
```

- case

```
case $var in
c1|const1|case1)
    # ...
    ;;
c2|case2)
    # ...
    ;;
c3)
    # ...
    ;;
*)
    # ...
esac
```

- for

```
for var in collection
do
    # ...
done
```

- while

```
# initialization
while [ condition ]
do
    # ...
    # modification
done
```

- until

```
# initialization
until [ condition ]
do
    # ...
    # modification
done
```



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## Shell Script : Functions

- Function without return

```
# function definition:
function fn_name()
{
    # args are accessed as $1, $2, $3, ...
    # ...
}

# function call:
fn_name arg1 arg2 arg3
```

- Function with return

```
# function definition:
function fn_name()
{
    # args are accessed as $1, $2, $3, ...
    # ...
    echo result
}

# function call:
var=${fn_name arg1 arg2 arg3}
```



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## Shell Script : Positional Parameters

- Positional parameters (like command line arguments in C)
- While executing shell script on command line, we can pass additional information called as "positional parameters".
- terminal> `./dem.sh one two three four`
- To access positional parameters in the script: `$1 $2 $3 $4 ... $9`
- List of all positional parameters: `$*`
- Shell script name: `$0`
- Number of positional parameters: `$#`
- **shift N** command is used to skip N parameters from left
- This will enable access to the next parameters.
- **N+1** parameter will become **\$1**
- **N+2** parameter will become **\$2**



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## Shell Script : Array

- Array is collection of values
  - `arr=(1,2,3,4,5)`
- To print all values: `${arr[*]}` or `${arr[@]}`
- To print individual element `${arr[i]}`
- To print number of elements: `${#arr[*]}`
- declaration is optional
  - `declare -a arr`



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## Shell Script : .bashrc and .profile

- **.bashrc file**
  - .bashrc is shell script that is executed when a new CLI bash shell is started.
  - We can add commands to be executed when new shell starts.
  - Example:
    - alias c=clear
    - echo "Welcome to bash!"
    - export PATH=/some/path:\$PATH
  - To edit the file
    - terminal> vim ~/.bashrc
    - Add your commands to the end of file.
  - These changes will be visible when new shell is started.
  - Close current terminal and open new terminal.
- **.profile file**
  - .profile is shell script that is executed when new login shell is started.
  - This will run for tty terminals or gui terminals.
  - When we need to execute some commands when any new login is done, those commands should be written in .profile.



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# Thank you!

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