

AHMET TURHAN

Shell Scripting

i2i-Systems
06.07.2021



Titles

- What Is Shell
- Shell Types
- What Is Shell Scripting
- Developing a Shell Script





what is Shell

A shell is a program that provides an interface between a user and an operating system (OS) kernel. An OS starts a shell for each user when the user logs in or opens a terminal or console window.

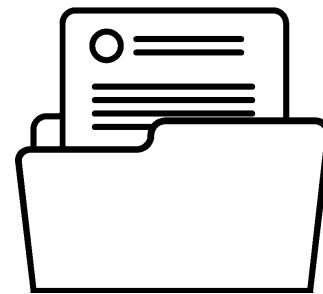
We use a mouse or finger to click icons and access files, programs, and folders on our devices. This is just one way for us to communicate with computers. The shell make up quick and powerfull interfce. We can communicate with computers more effectively and efficiently for wider set of tasks.



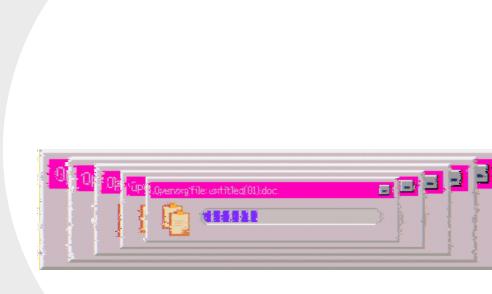
why we love it?



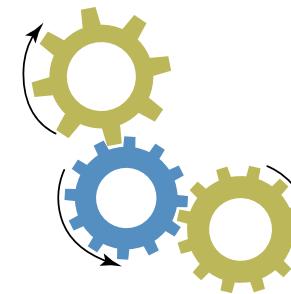
Collaborative
programming



Enables file
navigation



Runs
programming files



Installs developer
tools

Note: Shell provides a way for a user to execute utilities and programs.

Shell programs are text files that are interpreted, not compiled. The shell reads a line and processes all statements found on that line before reading the next line. Binary executables are loaded entirely into memory at the time of execution and their standalone nature means they do not require an initial. This is the reason that even the fastest shell programs always run slower than an equivalent program written in a compiled language.



What Are The Shell Types

- The Bourne Shell
- The C Shell
- The Korn Shell

The Bourne Shell

The Bourne shell (sh), written by Steve Bourne at AT&T Bell Labs, is the original UNIX shell. It is the preferred shell for shell programming because of its compactness and speed.

Note: The Bourne Shell is the default shell for Solaris system administration scripts.



The C Shell

Is a UNIX enhancement written by Bill Joy at the University of California at Berkeley. Includes convenient programming features, such as built-in arithmetic and a C-like expression syntax.





The Korn Shell

Was written by David Korn at AT&T Bell Labs. Is a superset of the Bourne shell. Supports everything in the Bourne shell. Has interactive features comparable to those in the C shell. Includes convenient programming features like built-in arithmetic and C like arrays, functions, and string-manipulation facilities. Is faster than the C shell.



- The GNU Bourne-Again Shell
- The Desktop Korn Shell
- The Job Control Shell
- The Restricted Shell Command Interpreter
- The Enhanced C Shell
- Z Shell

What Is Shell Scripting

A shell script is a file that contains shell and UNIX commands. Similar to compiled executable programs, the shell script has a specific purpose and is reusable. When the commands in the shell script are ordered and error-free, you can execute the shell script to carry out the tasks efficiently.



All scripts, programs, and procedures use the following rules:

- They should execute without error.
- They perform the task for which they are intended.
- They ensure that the program logic is clearly defined or apparent.
- They should not incorporate unnecessary work.

A large, stylized word "OOPS" is displayed in a bold, rounded font. The letters are primarily a bright cyan color, with a dark navy blue outline and a thick, shadowed base. The letters are slightly tilted, giving them a dynamic appearance.

Developing a Script

The structure of a shell script is flexible. You must ensure correct logic, flow control, and efficiency before tasks can be carried out easily and correctly by the user who executes the script.



Demo

SHELL SCRIPTING

```
gedit shellScript.sh

(base) ~ >>> whoami
ahmetturhan
(base) ~ >>> uname
Linux
(base) ~ >>> uname --help
Kullanım: uname [SEÇENEK]...
Belirli sistem bilgilerini yaz. SEÇENEK olmadan -s ile aynı.

-a, --all           sıralamaya uyarak tüm bilgileri yaz,
                   eğer bilinmiyorsa -p ve -i atlama hariç:
-s, --kernel-name  çekirdek adını yaz
-n, --nodename     ana ağ bilgisayarının adını yaz
-r, --kernel-release  çekirdek sürümünü yaz
-v, --kernel-version print the kernel version
-m, --machine      print the machine hardware name
-p, --processor    print the processor type (non-portable)
-i, --hardware-platform print the hardware platform (non-portable)
-o, --operating-system print the operating system
--help            bu yardımcı gösterir ve çıkar
--version         sürüm bilgisini gösterir ve çıkar

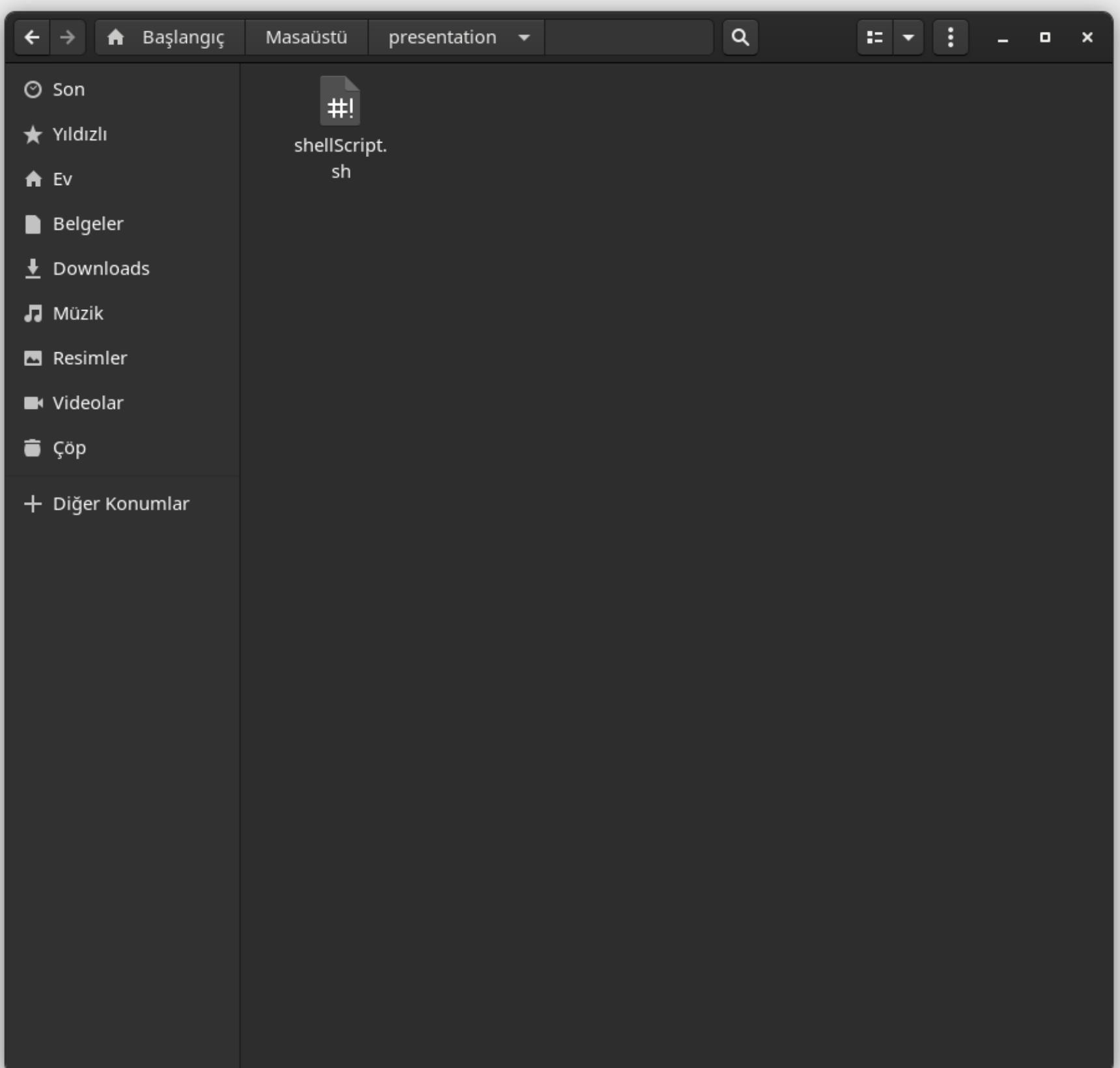
GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
Report any translation bugs to <https://translationproject.org/team/>
Full documentation <https://www.gnu.org/software/coreutils/uname>
or available locally via: info '(coreutils) uname invocation'

(base) ~ >>> uname -v
#1 SMP PREEMPT Sat Nov 28 09:08:57 UTC 2020
(base) ~ >>> uname -a
Linux manjaro 5.9.11-3-MANJARO #1 SMP PREEMPT Sat Nov 28 09:08:57 UTC 2020 x86_64 GNU/Linux
(base) ~ >>> cd Masaüstü
(base) ~/Masaüstü >>> ls
Golang  IdeaProjects 'Makine Öğrenmesi'  scriptler
(base) ~/Masaüstü >>> mkdir presentation
(base) ~/Masaüstü >>> cd presentation
(base) ~/Masaüstü/presentation >>> pwd
/home/ahmetturhan/Masaüstü/presentation
(base) ~/Masaüstü/presentation >>> gedit shellScript.sh

** (gedit:4570): WARNING **: 10:19:27.160: Error loading plugin: libvoikko.so.1: paylaşımı nesne dosya
sı açılamıyor: Böyle bir dosya ya da dizin yok

** (gedit:4570): WARNING **: 10:19:27.161: Error loading plugin: libhunspell-1.7.so.0: paylaşımı nesne
dosyası açılamıyor: Böyle bir dosya ya da dizin yok

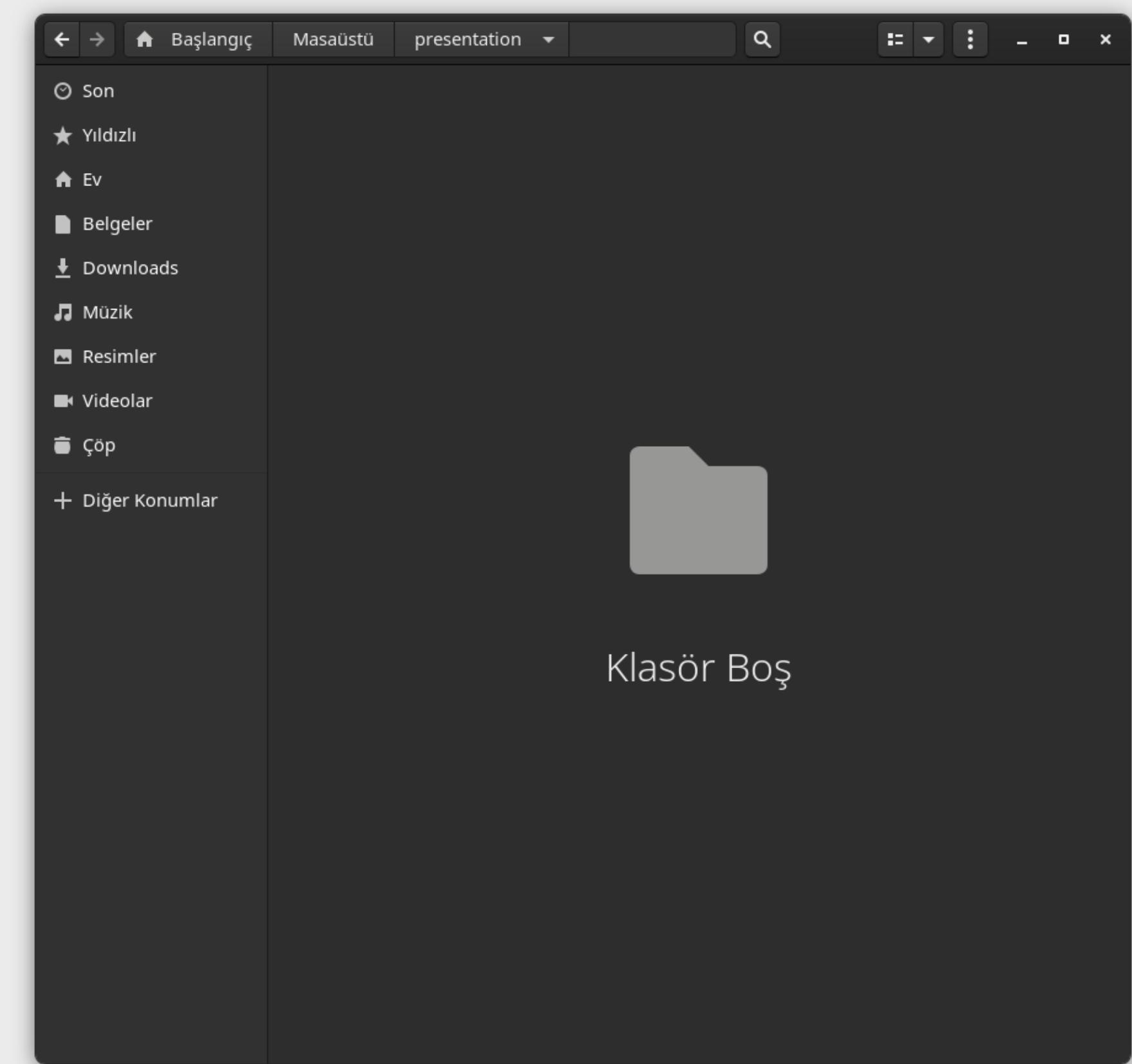
** (gedit:4570): WARNING **: 10:19:27.161: Error loading plugin: libaspell.so.15: paylaşımı nesne dosy
ası açılamıyor: Böyle bir dosya ya da dizin yok
```



SHELL SCRIPTING

17

```
ahmetturhan@manjaro:~/Masaüstü/presentation
(base) ~/Masaüstü/presentation >>> ls
shellScript.sh
(base) ~/Masaüstü/presentation >>> rm shellScript.sh
(base) ~/Masaüstü/presentation >>>
```



SHELL SCRIPTING

```
ahmetturhan@manjaro:~/Masaüstü/presentation
```

```
(base) ~/Masaüstü/presentation >>> echo 'Hello again World!!' > shellScript.sh
(base) ~/Masaüstü/presentation >>> cat shellScript.sh
Hello again World!!
(base) ~/Masaüstü/presentation >>> echo 'Hello again and again World !!' >> shellScript.sh
(base) ~/Masaüstü/presentation >>> cat shellScript.sh
Hello again World!!
Hello again and again World !!
(base) ~/Masaüstü/presentation >>>
```

```
Aç Kaydet
```

```
shellScript.sh
~/Masaüstü/presentation
```

```
1 Hello again World !!
2 Hello again and again World !!
3
4
```

```
sh ▾ Etiket Genişliği: 4 ▾ Sat 4, Süt 1 ▾ ÜZR
```

SHELL SCRIPTING

```
ahmetturhan@manjaro:~/Masaüstü/presentation

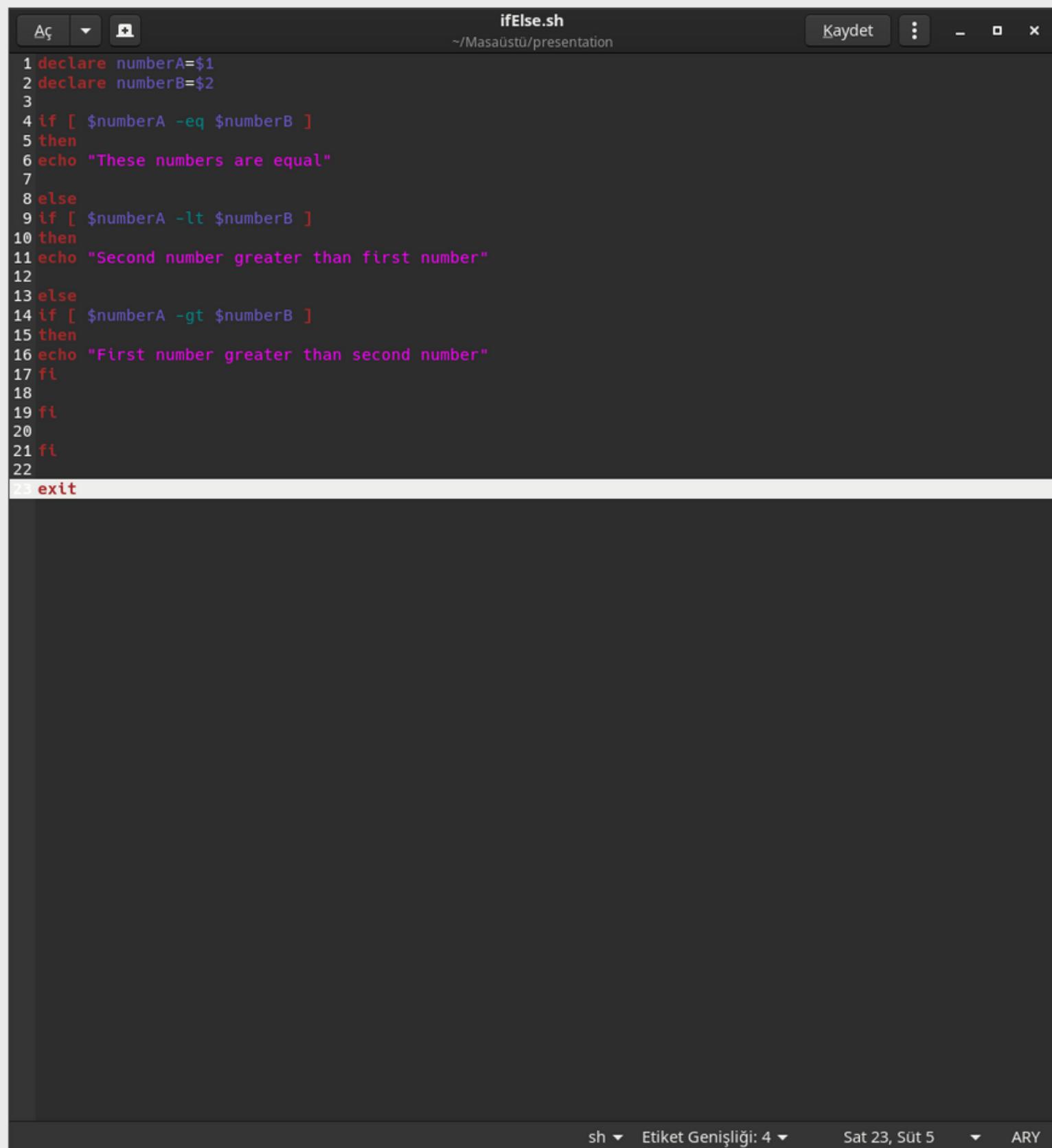
(base) ~/Masaüstü/presentation >>> declare -i numberA
(base) ~/Masaüstü/presentation >>> numberA=4
(base) ~/Masaüstü/presentation >>> declare -i numberB
(base) ~/Masaüstü/presentation >>> numberB=18
(base) ~/Masaüstü/presentation >>> declare -i numberC
(base) ~/Masaüstü/presentation >>> numberC=numberB+numberA
(base) ~/Masaüstü/presentation >>> declare -p numberC
typeset -i numberC=22
(base) ~/Masaüstü/presentation >>> echo $numberC
22
(base) ~/Masaüstü/presentation >>> declare -a colors=(red green blue yellow)
(base) ~/Masaüstü/presentation >>> echo ${colors[@]}
red green blue yellow
(base) ~/Masaüstü/presentation >>> echo ${colors[3]}
blue
(base) ~/Masaüstü/presentation >>> echo ${colors[0]}
red
(base) ~/Masaüstü/presentation >>> echo ${colors[1]}
green
(base) ~/Masaüstü/presentation >>> echo ${colors[2]}
blue
(base) ~/Masaüstü/presentation >>>
```

```
ahmetturhan@manjaro:~/Masaüstü/presentation

(base) ~/Masaüstü/presentation >>> ls
script2 shellScript.sh
(base) ~/Masaüstü/presentation >>> grep line script2
First line here
Second line here
Third line here
Fourth line here
Fifth line here
Twenty first line here
Twenty Second line here
Twenty Third line here
Twenty Fourth line here
Twenty Fifth line here
Twenty Sixth line here
Twenty Seventh line here
(base) ~/Masaüstü/presentation >>> grep line script2|grep Fifth script2
Fifth line here
Twenty Fifth line here
(base) ~/Masaüstü/presentation >>> grep line script2|grep Twenty script2
Twenty first line here
Twenty Second line here
Twenty Third line here
Twenty Fourth line here
Twenty Fifth line here
Twenty Sixth line here
Twenty Seventh line here
(base) ~/Masaüstü/presentation >>> grep line script2|grep Twenty script2|grep Sixth script2
Twenty Sixth line here
(base) ~/Masaüstü/presentation >>>
```

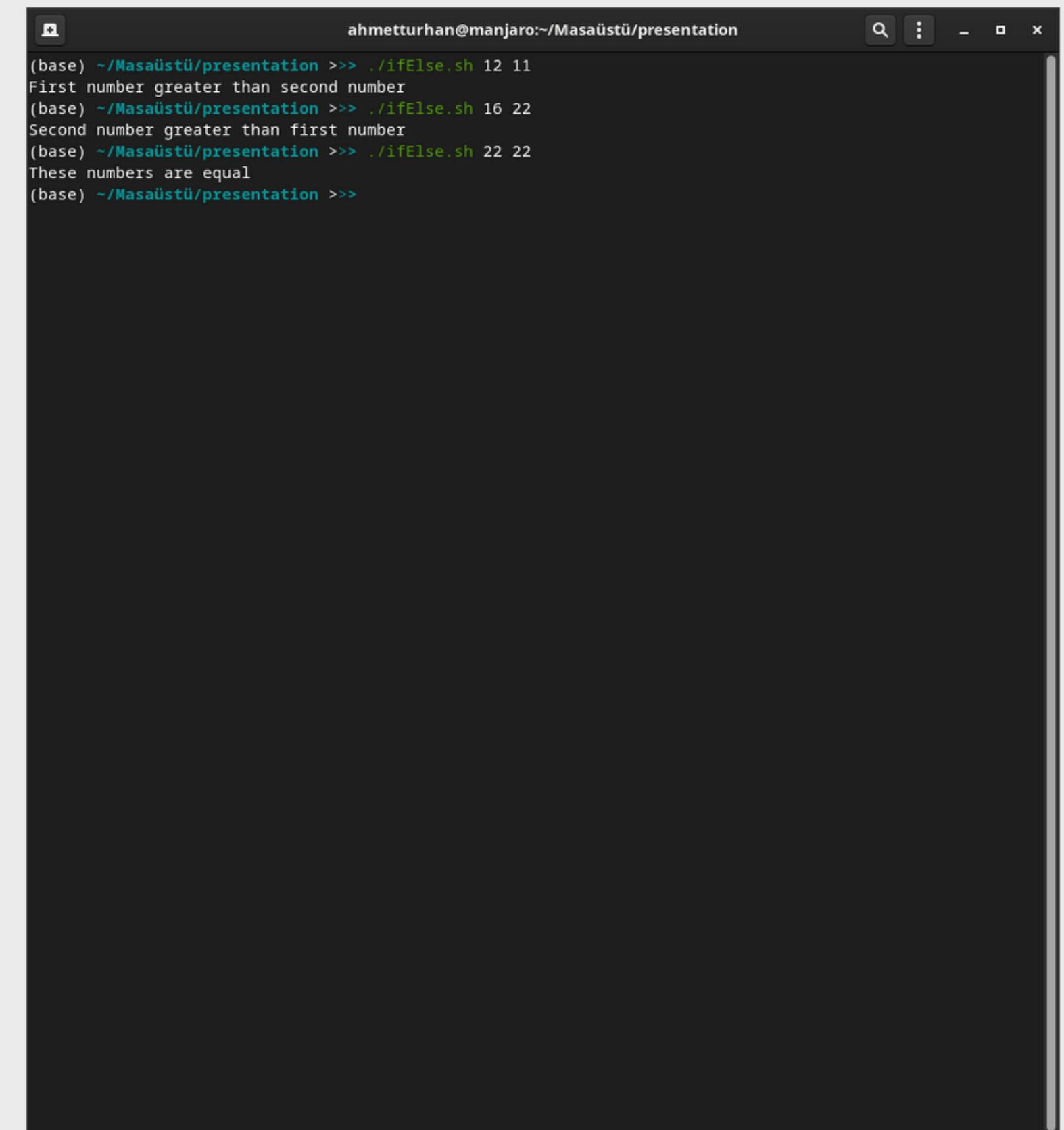
SHELL SCRIPTING

20



```
ifElse.sh
~/Masaüstü/presentation
Aç Kaydet : - x
1 declare numberA=$1
2 declare numberB=$2
3
4 if [ $numberA -eq $numberB ]
5 then
6 echo "These numbers are equal"
7
8 else
9 if [ $numberA -lt $numberB ]
10 then
11 echo "Second number greater than first number"
12
13 else
14 if [ $numberA -gt $numberB ]
15 then
16 echo "First number greater than second number"
17 fi
18
19 fi
20
21 fi
22
23 exit
```

sh ▾ Etiket Genişliği: 4 ▾ Sat 23, Süt 5 ▾ ARY



```
ahmetturhan@manjaro:~/Masaüstü/presentation
(base) ~/Masaüstü/presentation >>> ./ifElse.sh 12 11
First number greater than second number
(base) ~/Masaüstü/presentation >>> ./ifElse.sh 16 22
Second number greater than first number
(base) ~/Masaüstü/presentation >>> ./ifElse.sh 22 22
These numbers are equal
(base) ~/Masaüstü/presentation >>>
```

SHELL SCRIPTING

21

```
forSmp.sh
~/Masaüstü/presentation
1
2
3 for number in {1..13}
4 do
5
6 echo "$number"
7 done
8
```

sh ▾ Etiket Genişliği: 4 ▾ Sat 8, Süt 1 ▾ ARY

```
ahmetturhan@manjaro:~/Masaüstü/presentation
(base) ~/Masaüstü/presentation >>> gedit forSmp.sh
(base) ~/Masaüstü/presentation >>> chmod u+x forSmp.sh
(base) ~/Masaüstü/presentation >>> ./forSmp.sh
1
2
3
4
5
6
7
8
9
10
11
12
13
(base) ~/Masaüstü/presentation >>>
```

SHELL SCRIPTING

A screenshot of a dark-themed terminal window. The title bar says "whileSmp.sh" and "~/Masaüstü/presentation". The window has standard Linux-style buttons at the top right. The main area contains the following shell script code:

```
1 i="1"
2 while [ $i -le 18 ]
3 do
4
5 echo "$i"
6
7 i=$((i+1))
8
9 done
```

The status bar at the bottom shows "sh" and "Etiket Genişliği: 4" on the left, and "Sat 9, Süt 5" and "ÜZR" on the right.

A screenshot of a dark-themed terminal window. The title bar says "ahmetturhan@manjaro:~/Masaüstü/presentation". The window has standard Linux-style buttons at the top right. The main area shows the execution of the script:

```
(base) ~/Masaüstü/presentation >>> gedit whileSmp.sh
(base) ~/Masaüstü/presentation >>> chmod u+x whileSmp.sh
(base) ~/Masaüstü/presentation >>> ./whileSmp.sh
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
```

The status bar at the bottom shows "sh" and "Etiket Genişliği: 4" on the left, and "Sat 9, Süt 5" and "ÜZR" on the right.

Sources

- Shell_Programming_for_System_Administrators_course.pdf
- [https://en.wikipedia.org/wiki/David_Korn_\(computer_scientist\)](https://en.wikipedia.org/wiki/David_Korn_(computer_scientist))
- [https://en.wikipedia.org/wiki/Bill_Joy#/media/File:Bill_Joy_at_World_Economic_Forum_\(Davos\),_2003-01_\(cropped\).jpg](https://en.wikipedia.org/wiki/Bill_Joy#/media/File:Bill_Joy_at_World_Economic_Forum_(Davos),_2003-01_(cropped).jpg)
- https://en.wikipedia.org/wiki/Stephen_R._Bourne
- [https://www.codecademy.com/catalog/language/bash?g_network=g&g_device=c&g_adid=525783088319&g_keyword=%2Bshell%20%2Bscripting&g_campaign=ROW+Language%3A+Pro++Broad&g_acctid=243-039-7011&g_adtype=search&g_adgroupid=104765210142&g_keywordid=kwd-32011771751:ag_104765210142:cp_10947274263:n_g:d_c&utm_term=%2Bshell%20%2Bscripting&utm_campaign=ROW%20Language%3A%20Pro%20-%20Broad&utm_source=google&utm_medium=paid-search&utm_content=525783088319&hsa_acc=2430397011&hsa_cam=10947274263&hsa_grp=104765210142&hsa_ad=525783088319&hsa_src=g&hsa_tgt=kwd-32011771751&hsa_kw=%2Bshell%20%2Bscripting&hsa_mt=b&hsa_net=adwords&hsa_ver=3&gclid=CjwKCAjwmK6IBhBqEiwAocMc8ju6dDckmGgcHim0bfNvyVeQ-0LATI6qhD9inai3NX3AqiUmKQ1T-xoCv5YQAvD_BwE](https://www.codecademy.com/catalog/language/bash?g_network=g&g_device=c&g_adid=525783088319&g_keyword=%2Bshell%20%2Bscripting&g_campaign=ROW+Language%3A+Pro++Broad&g_acctid=243-039-7011&g_adtype=search&g_adgroupid=104765210142&g_keywordid=kwd-32011771751&g_campaignid=10947274263&utm_id=t_kw-32011771751:ag_104765210142:cp_10947274263:n_g:d_c&utm_term=%2Bshell%20%2Bscripting&utm_campaign=ROW%20Language%3A%20Pro%20-%20Broad&utm_source=google&utm_medium=paid-search&utm_content=525783088319&hsa_acc=2430397011&hsa_cam=10947274263&hsa_grp=104765210142&hsa_ad=525783088319&hsa_src=g&hsa_tgt=kwd-32011771751&hsa_kw=%2Bshell%20%2Bscripting&hsa_mt=b&hsa_net=adwords&hsa_ver=3&gclid=CjwKCAjwmK6IBhBqEiwAocMc8ju6dDckmGgcHim0bfNvyVeQ-0LATI6qhD9inai3NX3AqiUmKQ1T-xoCv5YQAvD_BwE)



**Thank you
for listening**