

- What should be the first line of a Bash script?
!/bin/bash
- What are the main differences between sh, bash, csh, and zsh?
sh is the original shell Unix systems use. bash is the default shell that Linux systems use. csh is a shell tht includes many C language sytaxes. zsh is an improvement of bash which has many new features.
- How to define and access variables?
Define: a=1
Access: \$a
- What is the meaning of \$0, \$1,, \$?, \$!?
\$0.\$1 are for the first, second,... input argument. \$? represents the return value of the previous command. \$! is the process id for the previous command.
- How to define arrays and access or assign elements?
Define: A=(v1 v2 v3 ...)
Access: \${A[0]},\${A[1]}...
Assign: A[0]=1
- How to perform if and switch statements? Provide an example.
If:
a=1
if [a -gt 0]; then
 echo \$a
else
 echo no
fi

Switch:
a=1
case \$a in
 1)
 echo foo ;;
 2)
 echo bar ;;
esac
- What are the various syntaxes of a for loop? For each type write a sample code.
1.
for a in abc bca bcb

```
do
    echo $a
done
```

2.

```
for f in *
do
    echo $f
done
```

3.

```
for ((i=0; i<10; ++i))
do
    echo $i
done
```

- How to write a while loop?

```
while [ condition ]
do
    operations
done
```

- What is the use of the PS3 variable? Provide a short code example.
PS3 variable is for those users' selection mode.

```
PS3="Select a day (1-4): "
select i in mon tue wed exit
do
    case $i in
        mon) echo "Monday";;
        tue) echo "Tuesday";;
        wed) echo "Wednesday";;
        exit) exit;;
    esac
done
```

- What is the purpose of the iconv command, and why is it useful?
iconv is a command that transfers the encoding of a string to another. It is useful because in many cases we will not only use ASCII characters and different computers/users might have different encodings.

- Given a variable \$temp what is the effect of \${#temp}, \${temp%%word}, \${temp/pattern/string}.
 \${#temp} will count the number of characters, \${temp%%word} will delete "word" at the end of temp. \${temp/pattern/string} will replace "pattern" in temp by "string"
- Provide a brief introduction to both of them, explaining how to use them and when they reveal to be the most helpful.
 sed is a command which operates on the input line by line with a given pattern. awk is a command which divides a line into several blocks and do operations on blocks.
- Using curl or wget retrieve information on shanghai air quality and pipe it to sed which should parse the output in order to display the information in the terminal following the format below AQ: value Temp: value C (e.g. AQ: 55 Temp: 24°C).

```
curl --silent 'http://aqicn.org/?city=Shanghai&widgetscript
&size=large&id=52b39d71decf07.20261781' | sed -e "s/<[^>]*
> //" -e "s/.*Air_Quality.\([0-9]*\).*Temp.\([0-9]*\).* /
AQ: \1 Temp: \2 C/g" -e "s/^[^A].* //g"
```

- Pipelining the output of ifconfig to awk return only the ip address of your current active network connection (the active network interface can be passed to ifconfig).

```
ifconfig | awk '/^[^ ]/{net=$1}/inet /&&net!="lo:"
{print net"\t"$2}'
```