# Shell
# Deci$ion Making and Loops

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# Decision Making in Shell

```
if [ expression ]
then
   Statement(s) to be executed if expression is
    true
fi
```

# Decision Making in Shell (cntd…)

```
if [ expression ]
then
   Statement(s) to be executed if expression is
    true
else
   Statement(s) to be executed if expression is
    not true
fi
```

# Decision Making in Shell (cntd…)

```
if [ expression 1 ]
then
   Statement(s) to be executed if expression 1 is true
elif [ expression 2 ]
then
   Statement(s) to be executed if expression 2 is true
else
   Statement(s) to be executed if no expression is true
fi
```

# Decision Making in Shell (cntd…)

**Try it!!**

```
#!/bin/sh
a=10
b=20
if [ $a == $b ]
then
   echo "a is equal to b"
elif [ $a -gt $b ]
then
   echo "a is greater than b"
elif [ $a -lt $b ]
then
   echo "a is less than b"
else
   echo "None of the condition met"
fi
```

# Decision Making in Shell (cntd…)

**Switch Case Statements**

```
case word in
  pattern1)
     Statement(s) to be executed if pattern1 matches
     ;;
  pattern2)
     Statement(s) to be executed if pattern2 matches
     ;;
  pattern3)
     Statement(s) to be executed if pattern3 matches
     ;;
esac
```

# Decision Making in Shell (cntd…)

**Switch Case Statements**

```
#!/bin/sh

FRUIT="kiwi"

case "$FRUIT" in
   "apple") echo "Apple pie is quite tasty."
   ;;
   "banana") echo "I like banana nut bread."
   ;;
   "kiwi") echo "New Zealand is famous for kiwi."
   ;;
esac
```

# Decision Making in Shell (cntd…)

**Switch Case Statements most usage!**

```
#!/bin/sh

option="${1}"
case ${option} in
   -f) FILE="${2}"
      echo "File name is $FILE"
      ;;
   -d) DIR="${2}"
      echo "Dir name is $DIR"
      ;;
   *)
      echo "`basename ${0}`:usage: [-f file] | [-d directory]"
      exit 1 # Command to come out of the program with status 1
      ;;
esac
```

# Loops in Shell(cntd…)

**For loops**

```
for var in word1 word2 … wordN
do
   Statement(s) to be executed for every word.
done
```

```
#!/bin/sh

for var in 0 1 2 3 4 5 6 7 8 9
do
   echo $var
done
```

# Loops in Shell(cntd…)

**For loops**

```
#!/bin/sh

for FILE in $HOME/.bash*
do
   echo $FILE
done
```

This will produce following result:

```
/root/.bash_history
/root/.bash_logout
/root/.bash_profile
/root/.bashrc
```

# Loops in Shell(cntd…)

**For loops more examples:**

```
$ cat for1.sh
i=1
for day in Mon Tue Wed Thu Fri
do
 echo "Weekday $((i++)) : $day"
done

$ ./for1.sh
Weekday 1 : Mon
Weekday 2 : Tue
Weekday 3 : Wed
Weekday 4 : Thu
Weekday 5 : Fri
```

# Loops in Shell(cntd…)

**For loops more examples (in-list):**

```
$ cat for2.sh
i=1
weekdays="Mon Tue Wed Thu Fri"
for day in $weekdays      # if “$weekdays” then single iteration
do
 echo "Weekday $((i++)) : $day"
done
```

```
$ ./for2.sh
Weekday 1 : Mon
Weekday 2 : Tue
Weekday 3 : Wed
Weekday 4 : Thu
Weekday 5 : Fri
```

# Loops in Shell(cntd…)

**For loops more examples (using positional parameters):**

```
$ cat for3.sh
i=1
for day
do
 echo "Weekday $((i++)) : $day"
done

$ ./for3.sh Mon Tue Wed Thu Fri
Weekday 1 : Mon
Weekday 2 : Tue
Weekday 3 : Wed
Weekday 4 : Thu
Weekday 5 : Fri
```

# Loops in Shell(cntd...)

**For loops more examples (getting files and directories):**

```
$ cat for5.sh
i=1
cd ~
for item in *                          ##(for all *.c, a*.....)
do
 echo "Item $((i++)) : $item"
done
```

```
$ ./for5.sh
Item 1 : positional-parameters.sh
Item 2 : backup.sh
Item 3 : emp-report.awk
Item 4 : item-list.sed ……..
```

# Loops in Shell(cntd…)

**For loops more examples (c style):**

```
$ cat for8.sh
for (( i=1; i <= 5; i++ ))
do
 echo "Random number $i: $RANDOM"
done

$ ./for8.sh
Random number 1: 23320
Random number 2: 5070
Random number 3: 15202
Random number 4: 23861
Random number 5: 23435
```

# Loops in Shell(cntd…)

**For loops more examples (c style):**

```
$ cat for9.sh
i=1;
for (( ; ; ))
do
     echo "Number: $((i++))“
done
```

>>Infinite loop

>>use ctrl c

# Loops in Shell(cntd…)

**For loops more examples (c style):**

```
$ cat for10.sh
for ((i=1, j=10; i <= 5 ; i++, j=j+5))
do
 echo "Number $i: $j"
done

$ ./for10.sh
Number 1: 10
Number 2: 15
Number 3: 20
Number 4: 25
Number 5: 30
```

# Loops in Shell(cntd…)

**For loops more examples (c style):**

```
$ cat for11.sh
for num in {1..10}
do
 echo "Number: $num"
done
```

```
$ ./for11.sh
Number: 1
Number: 2
Number: 3
Number: 4
Number: 5
…
```

# Loops in Shell(cntd…)

**For loops more examples (c style):**

```
$ cat for12.sh
for num in {1..10..2}
do
 echo "Number: $num"
done

$ ./for12.sh
Number: 1
Number: 3
Number: 5
Number: 7
Number: 9
```

# Loops in Shell(cntd…)

**While loop:**

```
while command
do
   Statement(s) to be executed if command is true
done
```

# Loops in Shell(cntd…)

**While loop:**

```
#!/bin/sh
a=0
while [ $a -lt 10 ]
do
   echo $a
   a=`expr $a + 1`
done
```

This will produce following result:

```
0
1
2
3
```

# Loops in Shell(cntd…)

**Until loop:**

```
until command
do
   Statement(s) to be executed until command is true
done
```

# Loops in Shell(cntd…)

**Until loop:**

```
#!/bin/sh

a=0

until [ ! $a -lt 10 ] # as long as this fails the loop continues
do
   echo $a
   a=`expr $a + 1`
done
```

Output?????

# Loops in Shell(cntd…)

- **<u>Shell Loop Controls</u>**

  **continue**

  **continue n**

  **break**

  **break n**

# Loops in Shell(cntd…)

**select loop:**

The *select* loop provides an easy way to create a numbered menu from which users can select options. It is useful when you need to ask the user to choose one or more items from a list of choices.

This loop was introduced in ksh and has been adapted into bash. It is not available in sh.

# Loops in Shell(cntd…)

**select loop:**

Syntax:

```
select var in word1 word2 … wordN
do
   Statement(s) to be executed for every word.
done
```

# Loops in Shell(cntd...)

**select loop:**

```
select DRINK in tea cofee water juice appe all none
do
  case $DRINK in
    tea|cofee|water|all)
      echo "Go to canteen"
      ;;
    juice|appe)
      echo "Available at home"
    ;;
    none)
      break
    ;;
    *) echo "ERROR: Invalid selection"
    ;;
  esac
done
```

# Loops in Shell(cntd…)

**select loop:**

```
$./test.sh
1) tea
2) cofee
3) water
4) juice
5) appe
6) all
7) none
#? juice
Available at home
#? None
$
```

# Loops in Shell(cntd…)

**For loops more examples (break outs and continue):**

1) Even numbers from 2 to 20.
2) Even numbers from a file num.txt
>cat num.txt
44 67 95 32 89 2 98

Using:
break;
continue;

# Loops in Shell(cntd…)

**Selection Sort:**

```
echo "Enter Numbers to be Sorted : "
read -a ARRAY
count=${#ARRAY[@]}

echo "----------------------------"
echo "Numbers Before Sort:"
printnumbers
sortnumbers
echo "Numbers After Sort: "
printnumbers
echo "----------------------------"
```

# Loops in Shell(cntd…)

**Selection Sort:**

```
printnumbers()
{
    echo ${ARRAY[*]}
}

swap()
    {
    temp=${ARRAY[$1]}
    ARRAY[$1]=${ARRAY[$2]}
    ARRAY[$2]=$temp
    }
```

# Loops in Shell(cntd…)

**Selection Sort:**

```
sortnumbers()
{
for ((i=0;i<count;i++))
do
        min=$i
        for ((j=i+1;j<count;j++))
        do
            if [ ${ARRAY[j]} -lt ${ARRAY[min]} ]
            then
                    min=$j
                fi
        done
 swap $i $min
done
}
```

# Loops in Shell(cntd…)

**Selection Sort:**

```
]# sh selectionsort.sh
  Enter Numbers to be Sorted :
  34 76 -8 12 23 5 9 -2 88 41 62
  ---------------------------
  Numbers Before Sort:
  34 76 -8 12 23 5 9 -2 88 41 62
  Numbers After Sort:
  -8 -2 5 9 12 23 34 41 62 76 88
  ---------------------------
```

# Shell Wildcards (cntd…)

| *Wildcard* | *Matches* |
|---|---|
| * | zero or more characters |
| ? | exactly one character |
| [abcde] | exactly one character listed |
| [a-e] | exactly one character in the given range |
| [!abcde] | any character that is not listed |
| [!a-e] | any character that is not in the given range |
| {debian,linux} | exactly one entire word in the options given |

# Shell Wildcards (cntd…)

$ **rm** *

Removes every file from the current directory

$ **mv *linux*.html dir1**

Moves all the HTML files, that have the word "linux" in their names, from the working directory into a directory named dir1

# Shell Wildcards (cntd…)

$ **rm junk.???**

Removes all files whose names begin with junk., followed by exactly three characters

$ **ls hda[0-9]**

List all files or directories whose names begin with hda, followed by exactly one numeral

# Shell Wildcards (cntd…)

$ **ls hda[0-9][0-9]**

Lists all files or directories beginning with hda, followed by exactly two numerals

$ **ls {hd,sd}[a-c]**

Lists all files or directories whose name starts with either hd or sd, followed by any single character between a and c

# Shell Wildcards (cntd…)

$ **cp [A-Z]* dir2**

Copies all files, that begin with an uppercase letter, to directory dir2

$ **rm *[!cehg]**

Deletes all files that don't end with c, e, h or g.