In this chapter, we will discuss in detail about special variable in Unix. In one of our previous chapters, we understood how to be careful when we use certain nonalphanumeric characters in variable names. This is because those characters are used in the names of special Unix variables. These variables are reserved for specific functions.

For example, the **$** character represents the process ID number, or PID, of the current shell −

$echo $$

The above command writes the PID of the current shell −

29949

The following table shows a number of special variables that you can use in your shell scripts −

|  |  |
| --- | --- |
| **Sr.No.** | **Variable & Description** |
| 1 | **$0**  The filename of the current script. |
| 2 | **$n**  These variables correspond to the arguments with which a script was invoked. Here **n** is a positive decimal number corresponding to the position of an argument (the first argument is $1, the second argument is $2, and so on). |
| 3 | **$#**  The number of arguments supplied to a script. |
| 4 | **$\***  All the arguments are double quoted. If a script receives two arguments, $\* is equivalent to $1 $2. |
| 5 | **$@**  All the arguments are individually double quoted. If a script receives two arguments, $@ is equivalent to $1 $2. |
| 6 | **$?**  The exit status of the last command executed. |
| 7 | **$$**  The process number of the current shell. For shell scripts, this is the process ID under which they are executing. |
| 8 | **$!**  The process number of the last background command. |

Command-Line Arguments

The command-line arguments $1, $2, $3, ...$9 are positional parameters, with $0 pointing to the actual command, program, shell script, or function and $1, $2, $3, ...$9 as the arguments to the command.

Following script uses various special variables related to the command line −

#!/bin/sh

echo "File Name: $0"

echo "First Parameter : $1"

echo "Second Parameter : $2"

echo "Quoted Values: $@"

echo "Quoted Values: $\*"

echo "Total Number of Parameters : $#"

Here is a sample run for the above script −

$./test.sh Zara Ali

File Name : ./test.sh

First Parameter : Zara

Second Parameter : Ali

Quoted Values: Zara Ali

Quoted Values: Zara Ali

Total Number of Parameters : 2

Special Parameters $\* and $@

There are special parameters that allow accessing all the command-line arguments at once. **$\*** and **$@** both will act the same unless they are enclosed in double quotes, **""**.

Both the parameters specify the command-line arguments. However, the "$\*" special parameter takes the entire list as one argument with spaces between and the "$@" special parameter takes the entire list and separates it into separate arguments.

We can write the shell script as shown below to process an unknown number of commandline arguments with either the $\* or $@ special parameters −

#!/bin/sh

for TOKEN in $\*

do

echo $TOKEN

done

Here is a sample run for the above script −

$./test.sh Zara Ali 10 Years Old

Zara

Ali

10

Years

Old

**Note** − Here **do...done** is a kind of loop that will be covered in a subsequent tutorial.

Exit Status

The **$?** variable represents the exit status of the previous command.

Exit status is a numerical value returned by every command upon its completion. As a rule, most commands return an exit status of 0 if they were successful, and 1 if they were unsuccessful.

Some commands return additional exit statuses for particular reasons. For example, some commands differentiate between kinds of errors and will return various exit values depending on the specific type of failure.

Following is the example of successful command −

$./test.sh Zara Ali

File Name : ./test.sh

First Parameter : Zara

Second Parameter : Ali

Quoted Values: Zara Ali

Quoted Values: Zara Ali

Total Number of Parameters : 2

$echo $?

0

$

In this chapter, we will discuss how to use shell arrays in Unix. A shell variable is capable enough to hold a single value. These variables are called scalar variables.

Shell supports a different type of variable called an **array variable**. This can hold multiple values at the same time. Arrays provide a method of grouping a set of variables. Instead of creating a new name for each variable that is required, you can use a single array variable that stores all the other variables.

All the naming rules discussed for Shell Variables would be applicable while naming arrays.

Defining Array Values

The difference between an array variable and a scalar variable can be explained as follows.

Suppose you are trying to represent the names of various students as a set of variables. Each of the individual variables is a scalar variable as follows −

NAME01="Zara"

NAME02="Qadir"

NAME03="Mahnaz"

NAME04="Ayan"

NAME05="Daisy"

We can use a single array to store all the above mentioned names. Following is the simplest method of creating an array variable. This helps assign a value to one of its indices.

array\_name[index]=value

Here *array\_name* is the name of the array, *index* is the index of the item in the array that you want to set, and value is the value you want to set for that item.

As an example, the following commands −

NAME[0]="Zara"

NAME[1]="Qadir"

NAME[2]="Mahnaz"

NAME[3]="Ayan"

NAME[4]="Daisy"

If you are using the **ksh** shell, here is the syntax of array initialization −

set -A array\_name value1 value2 ... valuen

If you are using the **bash** shell, here is the syntax of array initialization −

array\_name=(value1 ... valuen)

Accessing Array Values

After you have set any array variable, you access it as follows −

${array\_name[index]}

Here *array\_name* is the name of the array, and *index* is the index of the value to be accessed. Following is an example to understand the concept −

[Live Demo](http://tpcg.io/AMsECl)

#!/bin/sh

NAME[0]="Zara"

NAME[1]="Qadir"

NAME[2]="Mahnaz"

NAME[3]="Ayan"

NAME[4]="Daisy"

echo "First Index: ${NAME[0]}"

echo "Second Index: ${NAME[1]}"

The above example will generate the following result −

$./test.sh

First Index: Zara

Second Index: Qadir

You can access all the items in an array in one of the following ways −

${array\_name[\*]}

${array\_name[@]}

Here **array\_name** is the name of the array you are interested in. Following example will help you understand the concept −

[Live Demo](http://tpcg.io/r8Dol0)

#!/bin/sh

NAME[0]="Zara"

NAME[1]="Qadir"

NAME[2]="Mahnaz"

NAME[3]="Ayan"

NAME[4]="Daisy"

echo "First Method: ${NAME[\*]}"

echo "Second Method: ${NAME[@]}"

The above example will generate the following result −

$./test.sh

First Method: Zara Qadir Mahnaz Ayan Daisy

Second Method: Zara Qadir Mahnaz Ayan Daisy