Shell Scripts

The basic concept of a shell script is a list of commands, which are listed in the order of execution. A good shell script will have comments, preceded by **#** sign, describing the steps.

There are conditional tests, such as value A is greater than value B, loops allowing us to go through massive amounts of data, files to read and store data, and variables to read and store data, and the script may include functions.

We are going to write many scripts in the next sections. It would be a simple text file in which we would put all our commands and several other required constructs that tell the shell environment what to do and when to do it.

Shell scripts and functions are both interpreted. This means they are not compiled.

Example Script

Assume we create a **test.sh** script. Note all the scripts would have the **.sh** extension. Before you add anything else to your script, you need to alert the system that a shell script is being started. This is done using the **shebang** construct. For example −

#!/bin/sh

This tells the system that the commands that follow are to be executed by the Bourne shell. *It's called a shebang because the****#****symbol is called a hash, and the ! symbol is called a bang*.

To create a script containing these commands, you put the shebang line first and then add the commands −

#!/bin/bash

pwd

ls

You can put your comments in your script as follows −

#!/bin/bash

# Author : Zara Ali

# Copyright (c) Tutorialspoint.com

# Script follows here:

pwd

ls

Save the above content and make the script executable −

$chmod +x test.sh

The shell script is now ready to be executed −

$./test.sh

Upon execution, you will receive the following result −

/home/amrood

index.htm unix-basic\_utilities.htm unix-directories.htm

test.sh unix-communication.htm unix-environment.htm

## Extended Shell Scripts

Shell scripts have several required constructs that tell the shell environment what to do and when to do it. Of course, most scripts are more complex than the above one.

The shell is, after all, a real programming language, complete with variables, control structures, and so forth. No matter how complicated a script gets, it is still just a list of commands executed sequentially.

The following script uses the **read** command which takes the input from the keyboard and assigns it as the value of the variable PERSON and finally prints it on STDOUT.

#!/bin/sh

# Author : Zara Ali

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# Script follows here:

echo "What is your name?"

read PERSON

echo "Hello, $PERSON"

Here is a sample run of the script −

$./test.sh

What is your name?

Zara Ali

Hello, Zara Ali

$

A variable is a character string to which we assign a value. The value assigned could be a number, text, filename, device, or any other type of data.

A variable is nothing more than a pointer to the actual data. The shell enables you to create, assign, and delete variables.

Variable Names

The name of a variable can contain only letters (a to z or A to Z), numbers ( 0 to 9) or the underscore character ( \_).

By convention, Unix shell variables will have their names in UPPERCASE.

The following examples are valid variable names −

\_ALI

TOKEN\_A

VAR\_1

VAR\_2

Following are the examples of invalid variable names −

2\_VAR

-VARIABLE

VAR1-VAR2

VAR\_A!

The reason you cannot use other characters such as **!**, **\***, or **-** is that these characters have a special meaning for the shell.

Defining Variables

Variables are defined as follows −

variable\_name=variable\_value

For example −

NAME="Zara Ali"

The above example defines the variable NAME and assigns the value "Zara Ali" to it. Variables of this type are called **scalar variables**. A scalar variable can hold only one value at a time.

Shell enables you to store any value you want in a variable. For example −

VAR1="Zara Ali"

VAR2=100

Accessing Values

To access the value stored in a variable, prefix its name with the dollar sign (**$**) −

For example, the following script will access the value of defined variable NAME and print it on STDOUT −

[Live Demo](http://tpcg.io/AP7zgT)

#!/bin/sh

NAME="Zara Ali"

echo $NAME

The above script will produce the following value −

Zara Ali

Read-only Variables

Shell provides a way to mark variables as read-only by using the read-only command. After a variable is marked read-only, its value cannot be changed.

For example, the following script generates an error while trying to change the value of NAME −

[Live Demo](http://tpcg.io/tawT1C)

#!/bin/sh

NAME="Zara Ali"

readonly NAME

NAME="Qadiri"

The above script will generate the following result −

/bin/sh: NAME: This variable is read only.

## Unsetting Variables

Unsetting or deleting a variable directs the shell to remove the variable from the list of variables that it tracks. Once you unset a variable, you cannot access the stored value in the variable.

Following is the syntax to unset a defined variable using the **unset** command −

unset variable\_name

The above command unsets the value of a defined variable. Here is a simple example that demonstrates how the command works −

#!/bin/sh

NAME="Zara Ali"

unset NAME

echo $NAME

The above example does not print anything. You cannot use the unset command to **unset** variables that are marked **readonly**.

## Variable Types

When a shell is running, three main types of variables are present −

* **Local Variables** − A local variable is a variable that is present within the current instance of the shell. It is not available to programs that are started by the shell. They are set at the command prompt.
* **Environment Variables** − An environment variable is available to any child process of the shell. Some programs need environment variables in order to function correctly. Usually, a shell script defines only those environment variables that are needed by the programs that it runs.
* **Shell Variables** − A shell variable is a special variable that is set by the shell and is required by the shell in order to function correctly. Some of these variables are environment variables whereas others are local variables.