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# Programming Constructs - Arrays

## 5. Arrays

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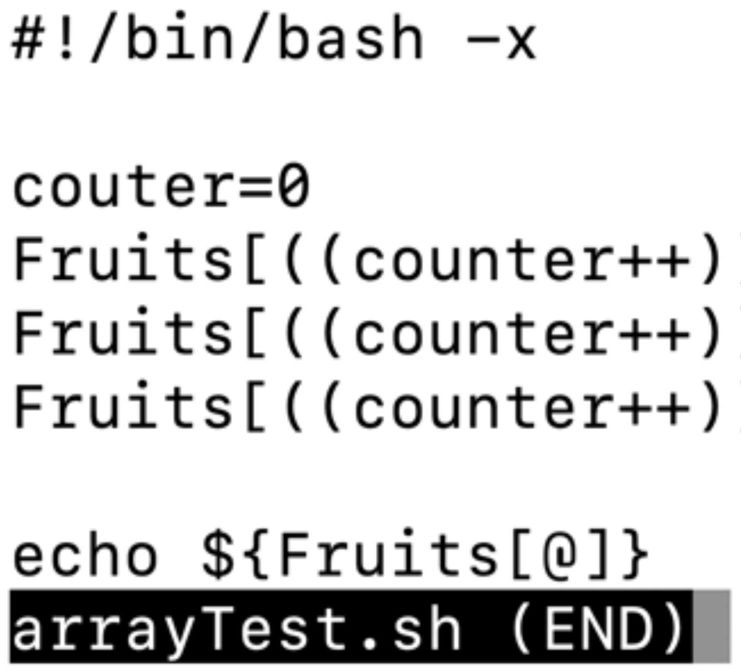
An array is a systematic arrangement of the same type of data.

But in Shell script Array is a variable which contains multiple values may be of same type or different type since by default in shell script everything is treated as a string.

An array is zero-based i.e. indexing start with 0.

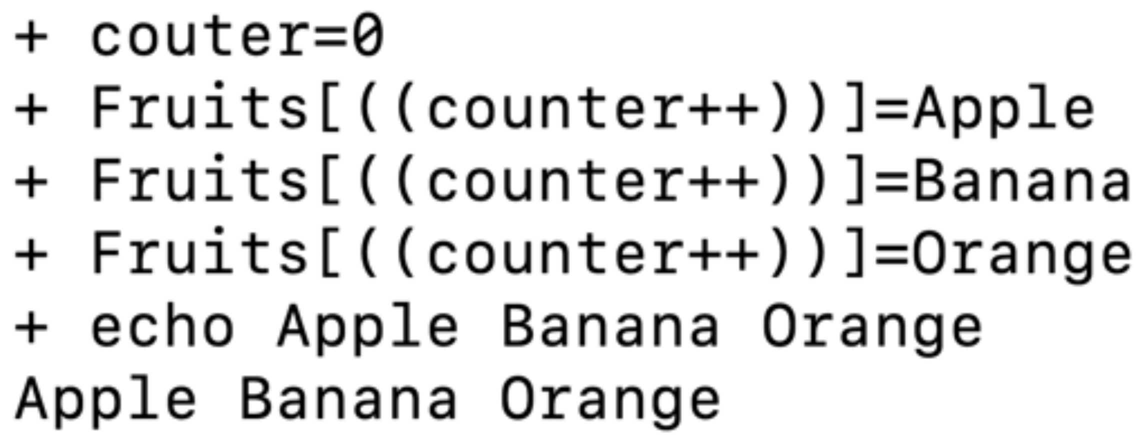
# Array Example



```
#!/bin/bash -x

couter=0
Fruits[((counter++))]="Apple"
Fruits[((counter++))]="Banana"
Fruits[((counter++))]="Orange"

echo ${Fruits[@]}
arrayTest.sh (END)
```



```
+ couter=0
+ Fruits[((counter++))]=Apple
+ Fruits[((counter++))]=Banana
+ Fruits[((counter++))]=Orange
+ echo Apple Banana Orange
Apple Banana Orange
```

UC 8

## Store the Daily Wage along with the Total Wage

## Storing Daily Wage in Array

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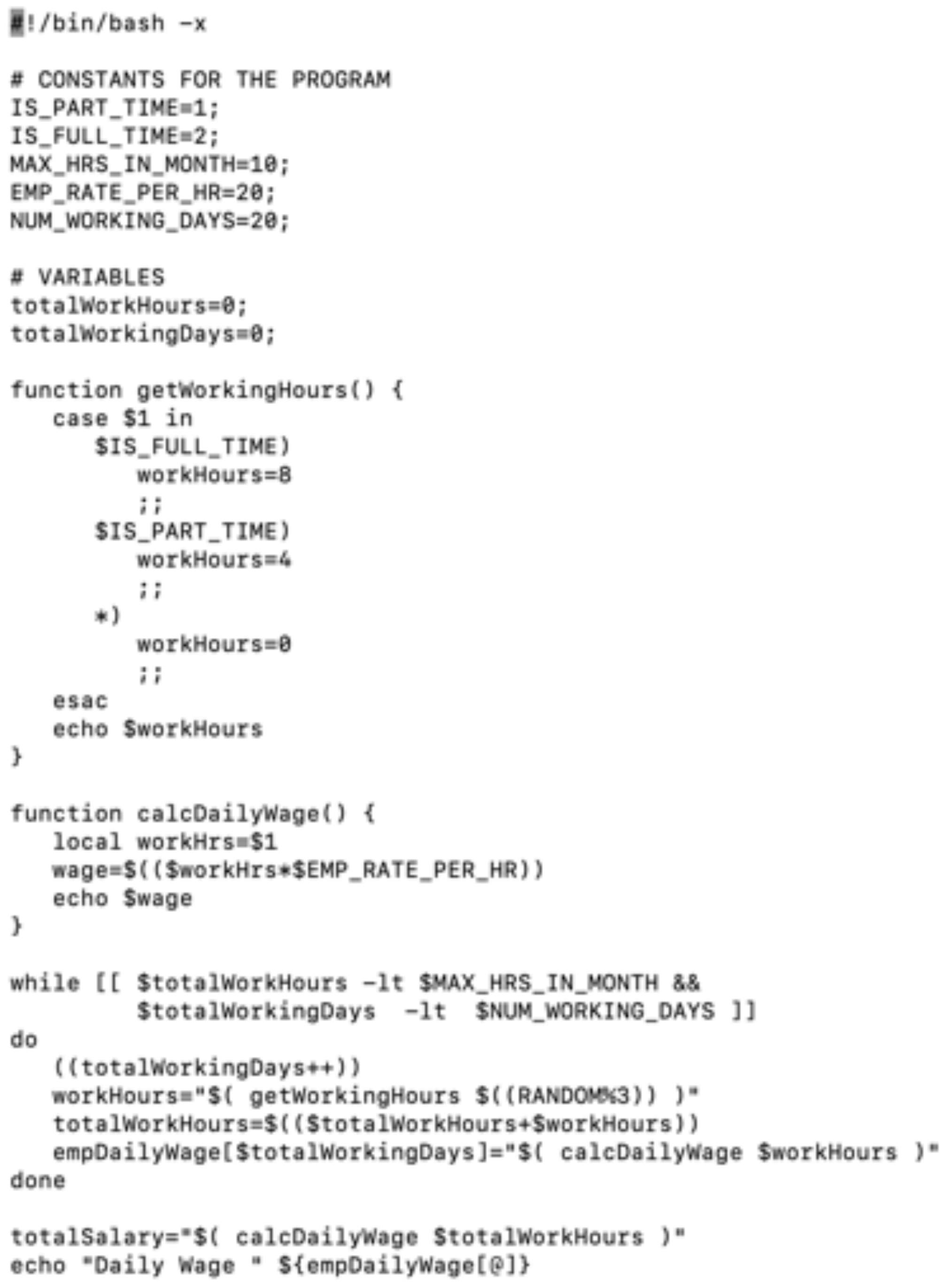
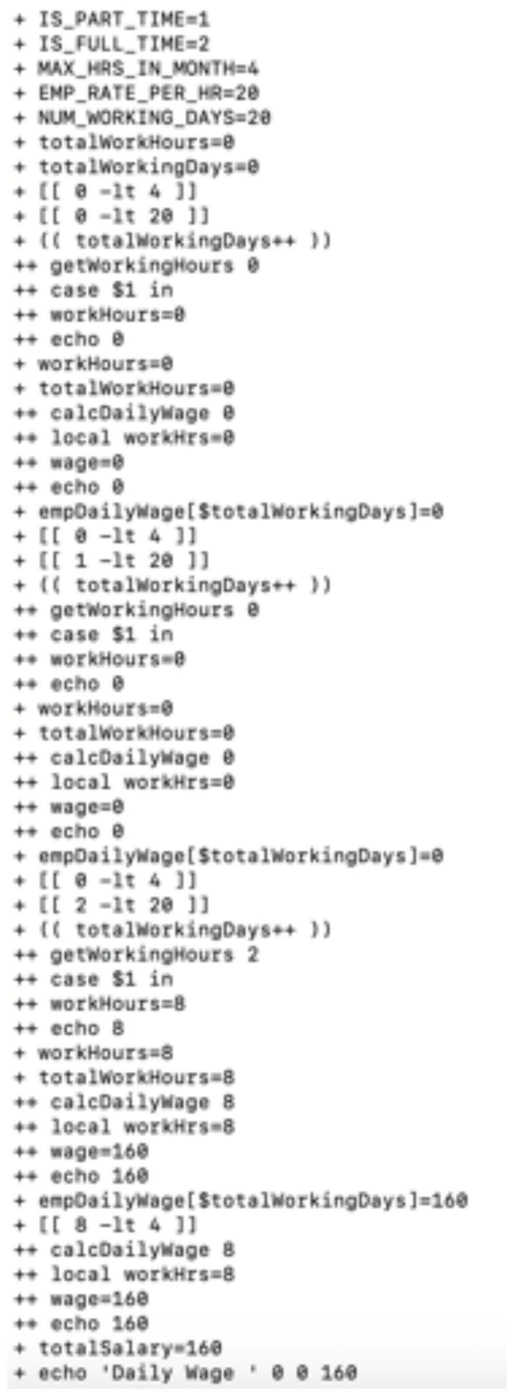


```
#!/bin/bash -x

# CONSTANTS FOR THE PROGRAM
IS_PART_TIME=1;
IS_FULL_TIME=2;
MAX_HRS_IN_MONTH=10;
EMP_RATE_PER_HR=20;
NUM_WORKING_DAYS=20;

# VARIABLES
totalWorkHours=0;
totalWorkingDays=0;

function getWorkingHours() {
   case $1 in
      $IS_FULL_TIME)
         workHours=8
         ;;
      $IS_PART_TIME)
         workHours=4
         ;;
      *)
         workHours=0
         ;;
   esac
   echo $workHours
}

function calcDailyWage() {
   local workHrs=$1
   wage=$(($workHrs*$EMP_RATE_PER_HR))
   echo $wage
}

while [[ $totalWorkHours -lt $MAX_HRS_IN_MONTH &&
         $totalWorkingDays  -lt  $NUM_WORKING_DAYS ]]
do
   ((totalWorkingDays++))
   workHours="$( getWorkingHours $((RANDOM%3)) )"
   totalWorkHours=$(($totalWorkHours+$workHours))
   empDailyWage[$totalWorkingDays]="$( calcDailyWage $workHours )"
done

totalSalary="$( calcDailyWage $totalWorkHours )"
echo "Daily Wage " ${empDailyWage[@]}
```



```
+ IS_PART_TIME=1
+ IS_FULL_TIME=2
+ MAX_HRS_IN_MONTH=4
+ EMP_RATE_PER_HR=20
+ NUM_WORKING_DAYS=20
+ totalWorkHours=0
+ totalWorkingDays=0
+ [[ 0 -lt 4 ]]
+ [[ 0 -lt 20 ]]
+ (( totalWorkingDays++ ))
++ getWorkingHours 0
++ case $1 in
++ workHours=0
++ echo 0
+ workHours=0
+ totalWorkHours=0
++ calcDailyWage 0
++ local workHrs=0
++ wage=0
++ echo 0
+ empDailyWage[$totalWorkingDays]=0
+ [[ 0 -lt 4 ]]
+ [[ 1 -lt 20 ]]
+ (( totalWorkingDays++ ))
++ getWorkingHours 0
++ case $1 in
++ workHours=0
++ echo 0
+ workHours=0
+ totalWorkHours=0
++ calcDailyWage 0
++ local workHrs=0
++ wage=0
++ echo 0
+ empDailyWage[$totalWorkingDays]=0
+ [[ 0 -lt 4 ]]
+ [[ 2 -lt 20 ]]
+ (( totalWorkingDays++ ))
++ getWorkingHours 2
++ case $1 in
++ workHours=8
++ echo 8
+ workHours=8
+ totalWorkHours=8
++ calcDailyWage 8
++ local workHrs=8
++ wage=160
++ echo 160
+ empDailyWage[$totalWorkingDays]=160
+ [[ 8 -lt 4 ]]
++ calcDailyWage 8
++ local workHrs=8
++ wage=160
++ echo 160
+ totalSalary=160
+ echo 'Daily Wage ' 0 0 160
```

# Arrays Practice Problems

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1. Write a program that does the following
   a. Generates 10 Random 3 Digit number.
   b. Store this random numbers into a array.
   c. Then find the 2nd largest and the 2nd smallest element without sorting the array.
2. Extend the above program to sort the array and then find the 2nd largest and the 2nd smallest element.
3. Extend the Prime Factorization Program to store all the Prime Factors of a number n into an array and finally display the output.
4. Write a Program to show Sum of three Integer adds to ZERO
5. Take a range from 0 – 100, find the digits that are repeated twice like 33, 77, etc and store them in an array

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Thank You