**Array Assignment\_Stage2**

**Arrays Practice Problems**

1. Write a program in the following steps

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.

**Code:**

**For Second Largest**

for (( i=0; i<10; i++ ))

do

arr[$i]=$((RANDOM % 900 +100 ))

done

echo ${arr[\*]}

first=${arr[0]}

second=${arr[0]}

for (( i=0; i<10; i++ ))

do

if (( $first < ${arr[$i]} ))

then

second=$first

first=${arr[i]}

else

if (( ${arr[$i]} > $second & ${arr[$i]} != $first ))

then

second=${arr[$i]}

fi

fi

done

echo "$second is second largest"

**Output:**

**For second largest**

nida@nida-PC MINGW64 ~/TerminalCommnads/stage3/array

$ ./q1\_1.sh

586 206 245 242 356 392 539 946 679 967

946 is second largest

**For second Smallest**

**Code:**

for (( i=0; i<10; i++ ))

do

arr[$i]=$((RANDOM % 900 +100 ))

done

echo ${arr[\*]}

first=${arr[0]}

second=${arr[0]}

for (( i=0; i<10; i++ ))

do

if (( $first > ${arr[$i]} ))

then

second=$first

first=${arr[i]}

else

if (( ${arr[$i]} < $second & ${arr[$i]} != $first ))

then

second=${arr[$i]}

fi

fi

done

echo "$second is second Smallest"

**Output:**

nida@nida-PC MINGW64 ~/TerminalCommnads/stage3/array

$ ./q1\_1.sh

526 151 176 174 289 598 459 674 240 822

174 is second Smallest

2. Extend the above program to sort the array and then find the 2nd largest and the 2nd smallest element.

**Code:**

#! /bin/bash

n=10

for (( i=0; i<10; i++ ))

do

arr[$i]=$((RANDOM % 900 + 100))

done

echo "Unsorted array:"

echo ${arr[\*]}

for (( i=0; i<10; i++ ))

do

for(( j=0; j<10-i-1; j++ ))

do

if(( ( ${arr[j]} > ${arr[$((j+1))]} ) ))

then

temp=${arr[j]}

arr[$j]=${arr[$((j+1))]}

arr[$((j+1))]=$temp

fi

done

done

echo "Sorted Array"

echo ${arr[\*]}

echo "The Second Largest element:" ${arr[$((n-2))]}

echo "The Second Smallest element: " ${arr[1]}

**Output:**

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$ ./q2.sh

Unsorted array:

657 413 852 570 868 172 596 121 391 430

Sorted Array

121 172 391 413 430 570 596 657 852 868

The Second Largest element: 852

The Second Smallest element: 172

3. Extend the Prime Factorization Program to store all the Prime Factors of a number n into an array and finally display the output.

**Code:**

#!/bin/bash

read -p "Enter the value for number: " n

c=0

flag=0

for(( i=2; i<n; i++ ))

do

if (( ( $n % $i == 0 ) ))

then

if (( ( $i % 2 != 0 | $i == 2 ) ))

then

flag=1

arr[$c]=$i

((c++))

fi

fi

done

if [ $flag -eq 1 ]

then

echo "The factors of $n is:"

echo ${arr[\*]}

else

echo "$n is itself a prime number"

fi

**Output:**

nida@nida-PC MINGW64 ~/TerminalCommnads/stage3/array

$ ./q3.sh

Enter the value for number: 13

13 is itself a prime number

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$ ./q3.sh

Enter the value for number: 14

The factors of 14 is:

2 7

4. Write a Program to show Sum of three Integer adds to ZERO

**Code:**

#! /bin/bash

flag=0

arr=(0 -1 2 -3 1)

echo "Array elements: "${arr[\*]}

sum=$(( ${arr[0]} + ${arr[1]} + ${arr[2]} ))

n=$((${#arr[@]}))

for (( i=0; i<$((n-2)); i++ ))

do

for (( j=$((i+1)); j<$((n-1)); j++ ))

do

for (( k=$((j+1)); k<$n; k++ ))

do

sum=$((${arr[$i]} + ${arr[$j]} + ${arr[$k]}))

if [[ $sum -eq 0 ]]

then

echo "Combination: "${arr[$i]} "+" ${arr[$j]} "+" ${arr[$k]}

flag=1

fi

done

done

done

if [ $flag == 0 ]

then

echo "Combination doesn't Exist"

fi

**Output:**

nida@nida-PC MINGW64 ~/TerminalCommnads/stage3/array

$ ./q4.sh

Array elements: 0 -1 2 -3 1

Combination: 0 + -1 + 1

Combination: 2 + -3 + 1

5. Take a range from 0 – 100, find the digits that are repeated twice like 33, 77, etc and store them in an array

**Code:**

#! /bin/bash

c=0

for(( n=1; n<=100 ; n++ ))

do

if (( n%11 == 0 ))

then

arr[$c]=$n

((c++))

fi

done

echo ${arr[\*]}

**Output:**

nida@nida-PC MINGW64 ~/TerminalCommnads/stage3/array

$ ./q5.sh

11 22 33 44 55 66 77 88 99