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Day7: Arrays Practice Problems

1. Write a program in the following steps
 - a. Generates 10 Random 3 Digit number.
 - b. Store these random numbers into an array.
 - c. Then find the 2nd largest and the 2nd smallest element without sorting the array.

Shell Script:

```
#!/bin/bash -x
arr=()
for i in `seq 0 9`
do
    randomNo=$((100+$RANDOM%999))
    arr[i]=$randomNo
done
first=${arr[0]}
min=$first
minTwo=$first
max=$first
maxTwo=$first
for j in ${arr[@]}
do
    if [ $j -lt $min ]
    then
        minTwo=$min
        min=$j
    elif [ $j -lt $minTwo -a $j -ne $min ]
    then
        minTwo=$j
    fi
    if [ $j -gt $max ]
    then
        maxTwo=$max
        max=$j
    elif [ $j -gt $maxTwo -a $j -ne $max ]
    then
        maxTwo=$j
    fi
done
echo "Second minimum: $minTwo"
```

```
echo "Second maximum: $maxTwo"
```

Output:

```
$ ./arrayprog1.sh
+ arr=()
++ seq 0 9
+ for i in `seq 0 9`
+ randomNo=936
+ arr[i]=936
+ for i in `seq 0 9`
+ randomNo=743
+ arr[i]=743
+ for i in `seq 0 9`
+ randomNo=321
+ arr[i]=321
+ for i in `seq 0 9`
+ randomNo=937
+ arr[i]=937
+ for i in `seq 0 9`
+ randomNo=263
+ arr[i]=263
+ for i in `seq 0 9`
+ randomNo=977
+ arr[i]=977
+ for i in `seq 0 9`
+ randomNo=202
+ arr[i]=202
+ for i in `seq 0 9`
+ randomNo=949
+ arr[i]=949
+ for i in `seq 0 9`
+ randomNo=589
+ arr[i]=589
+ for i in `seq 0 9`
+ randomNo=451
+ arr[i]=451
+ first=936
+ min=936
+ minTwo=936
+ max=936
+ maxTwo=936
+ for j in ${arr[@]}
+ '[' 936 -lt 936 ']'
+ '[' 936 -lt 936 -a 936 -ne 936 ']'
+ '[' 936 -gt 936 ']'
+ '[' 936 -gt 936 -a 936 -ne 936 ']'
```

```

+ for j in ${arr[@]}
+ '[' 743 -lt 936 ']'
+ minTwo=936
+ min=743
+ '[' 743 -gt 936 ']'
+ '[' 743 -gt 936 -a 743 -ne 936 ']'
+ for j in ${arr[@]}
+ '[' 321 -lt 743 ']'
+ minTwo=743
+ min=321
+ '[' 321 -gt 936 ']'
+ '[' 321 -gt 936 -a 321 -ne 936 ']'
+ for j in ${arr[@]}
+ '[' 937 -lt 321 ']'
+ '[' 937 -lt 743 -a 937 -ne 321 ']'
+ '[' 937 -gt 936 ']'
+ maxTwo=936
+ max=937
+ for j in ${arr[@]}
+ '[' 263 -lt 321 ']'
+ minTwo=321
+ min=263
+ '[' 263 -gt 937 ']'
+ '[' 263 -gt 936 -a 263 -ne 937 ']'
+ for j in ${arr[@]}
+ '[' 977 -lt 263 ']'
+ '[' 977 -lt 321 -a 977 -ne 263 ']'
+ '[' 977 -gt 937 ']'
+ maxTwo=937
+ max=977
+ for j in ${arr[@]}
+ '[' 202 -lt 263 ']'
+ minTwo=263
+ min=202
+ '[' 202 -gt 977 ']'
+ '[' 202 -gt 937 -a 202 -ne 977 ']'
+ for j in ${arr[@]}
+ '[' 949 -lt 202 ']'
+ '[' 949 -lt 263 -a 949 -ne 202 ']'
+ '[' 949 -gt 977 ']'
+ '[' 949 -gt 937 -a 949 -ne 977 ']'
+ maxTwo=949
+ for j in ${arr[@]}
+ '[' 589 -lt 202 ']'
+ '[' 589 -lt 263 -a 589 -ne 202 ']'
+ '[' 589 -gt 977 ']'
+ '[' 589 -gt 949 -a 589 -ne 977 ']'
+ for j in ${arr[@]}

```

```

+ '[' 451 -lt 202 ']'
+ '[' 451 -lt 263 -a 451 -ne 202 ']'
+ '[' 451 -gt 977 ']'
+ '[' 451 -gt 949 -a 451 -ne 977 ']'
+ echo 'Second minimum: 263'
Second minimum: 263
+ echo 'Second maximum: 949'
Second maximum: 949

```

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

Shell Script:

```

#!/bin/bash
function bubbleSort(){
    ar=($@)
    arLen=${#ar[@]}
    for(( i=0 ; i<$arLen ; i++))
    do
        for(( j=0 ; j<$arLen-$i-1 ; j++ ))
        do
            if [ ${ar[j]} -gt ${ar[(j+1)]} ]
            then
                temp=${ar[j]}
                ar[j]=${ar[(j+1)]}
                ar[(j+1)]=temp
            fi
        done
    done
    echo ${ar[@]}
}
arr=()
for k in `seq 0 9`
do
    randomNo=$((100+$RANDOM%999))
    arr[k]=$randomNo
done
sortedArr=(`bubbleSort ${arr[@]}`)
arrLen=${#sortedArr[@]}
minTwo=${sortedArr[1]}
maxTwo=${sortedArr[$arrLen-2]}
echo "Second minimum: $minTwo"

```

```
echo "Second maximum: $maxTwo"
```

Output:

```
$ ./arrayprog2.sh
Second minimum: 160
Second maximum: 959
```

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

Shell Script:

```
#!/bin/bash
read -p "Enter number=" num
re=$num
count=0
array=()
echo "List of prime factors of $num"
for (( i=2;i<=$re;i++ )); do
while [ $((num % $i)) == 0 ]; do
echo "$i"
array[ $count ]=$i
num=$((num / $i))
((count++))
done
done
echo "Array is ${array[@]}"
echo "Array Size is ${#array[@]}"
```

Output:

```
$ ./primefactor.sh
Enter number=68
List of prime factors of 68
2
2
17
Array is 2 2 17
Array Size is 3
```

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

Shell Script:

```
#!/bin/bash
echo "Enter the array number: "
read n
for((i=0;i<n-2;i++))
do
    for((j=i+1;j<n-1;j++))
    do
        for((k=j+1;k<n;k++))
        if [[ ${a[$i]} + ${a[$j]} + ${a[$k]} -eq 0 ]]
        then
            echo "Triplet is ${a[$i]},${a[$j]},${a[$k]}"
        fi
    done
done
```

Output:

Enter the array number;

1 -2 1 0 5

Triplet is 1 + -2 + 1 = 0

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

Shell Script:

```
#!/bin/bash
echo -e "Digits which are repeating twice like 11,22,33.."
array=()
count=0
for i in `seq 100`
do
```

```
if [ $((i % 11)) -eq 0 ]
then
array[ $count ]=$i
echo "$i"
((count++))
fi
done
echo "Array is ${array[@]}"
echo "Size of array is ${#array[@]}"
```

Output:

```
$ ./repeatingnumber.sh
Digits which are repeating twice like 11,22,33..
11
22
33
44
55
66
77
88
99
Array is 11 22 33 44 55 66 77 88 99
Size of array is 9
```