OS LAB MCSE504P-Shell practice 2

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1. Write a shell program to calculate the total, average and final grade of 5 subjects for 3 students

```
#!/bin/bash

# Function to calculate total, average, and final grade
calculate_results() {
  local student=$1
  shift
  local marks=("$@")
  local total=0
  local count=0

  for mark in "${marks[@]}"; do
    total=$(echo "$total + $mark" | bc)
    count=$((count + 1))
  done

  average=$(echo "scale=2; $total / $count" | bc)

  # Determine the final grade
  if (( $(echo "$average >= 90" | bc -l) )); then
    grade="A"
  elif (( $(echo "$average >= 75" | bc -l) )); then
    grade="B"
  elif (( $(echo "$average >= 60" | bc -l) )); then
    grade="C"
  elif (( $(echo "$average >= 40" | bc -l) )); then
    grade="D"
  else
    grade="F"
  fi

  echo
  echo "Student $student Result:"
  echo "------------------------"
  echo "Total Marks   : $total"
  echo "Average Marks : $average"
  echo "Final Grade   : $grade"
  echo "------------------------"
}
```

```
# Main script
for student in 1 2 3; do
  echo
  echo "Enter marks for Student $student:"
  read -p "Marks for DSA: " mark1
  read -p "Marks for OS: " mark2
  read -p "Marks for DBMS: " mark3
  read -p "Marks for CN: " mark4
  read -p "Marks for Maths: " mark5

  calculate_results "$student" "$mark1" "$mark2" "$mark3" "$mark4" "$mark5"
done
```

```
student@614:~$ chmod +x Assi2a_24mcs1017.sh
student@614:~$ ./Assi2a_24mcs1017.sh

Enter marks for Student 1:
Marks for DSA: 56
Marks for OS: 37
Marks for DBMS: 82
Marks for CN: 83
Marks for Maths: 60

Student 1 Result:
-------------------------
Total Marks   : 318
Average Marks : 63.60
Final Grade   : C
-------------------------
```

```
Enter marks for Student 2:
Marks for DSA: 53
Marks for OS: 80
Marks for DBMS: 99
Marks for CN: 100
Marks for Maths: 72

Student 2 Result:
-------------------------
Total Marks   : 404
Average Marks : 80.80
Final Grade   : B
-------------------------

Enter marks for Student 3:
Marks for DSA: 81
Marks for OS: 29
Marks for DBMS: 91
Marks for CN: 27
Marks for Maths: 11

Student 3 Result:
-------------------------
Total Marks   : 239
Average Marks : 47.80
Final Grade   : D
-------------------------
```

2. **Write a shell program to add the digits of a number to a single digit, and check whether the sum is available in the number, if so print its place value.**

257 => 2+5+7 = 5

5 is available in place value 10

```
#!/bin/bash
echo "Name: Mahesh Jagtap"
echo "Registration Number: 24MCS1017"
# Read the number
read -p "Enter a number " num
# Function to calculate single-digit sum
sum_to_single_digit() {
    local n=$1
    local sum=0
    while [ $n -gt 0 ]; do
        sum=$(( sum + n % 10 ))
        n=$(( n / 10 ))
    done
    while [ $sum -ge 10 ]; do
        sum=$(sum_to_single_digit $sum)
    done
    echo $sum
}
# Calculate single digit
single_digit=$(sum_to_single_digit $num)
# Find if the digit is in the number and its place value
place=1
found=0
temp=$num
while [ $temp -gt 0 ]; do
    if [ $(( temp % 10 )) -eq $single_digit ]; then
        echo "$single_digit is available in place value $place"
        found=1
        break
    fi
    temp=$(( temp / 10 ))
    place=$(( place * 10 ))
done
if [ $found -eq 0 ]; then
    echo "$single_digit is not available in the number"
fi
```

```
Jagta@LAPTOP-15RS5VO0 MINGW64 ~/Downloads
$ chmod +x shell1.sh

Jagta@LAPTOP-15RS5VO0 MINGW64 ~/Downloads
$ ./shell1.sh
Name: Mahesh Jagtap
Registration Number: 24MCS1017
Enter a number 543
3 is available in place value 1
```

3. **Write a shell program to find the denominations of Indian currency for a given amount.**
   134 => 100 + 20+ 10 + 2 + 2

```
#!/bin/bash
echo "Name: Mahesh Jagtap"
echo "Registration Number: 24MCS1017"

# Function to calculate denominations
calculate_denominations() {
    amount=$1
    denominations=(2000 500 200 100 50 20 10 5 1)
    result=""

    for denom in "${denominations[@]}"; do
        count=$((amount / denom))
        if [ $count -gt 0 ]; then
            for ((i=0; i<count; i++)); do
                if [ -n "$result" ]; then
                    result="$result + "
                fi
                result="$result$denom"
            done
            amount=$((amount % denom))
        fi
    done

    echo "$1 => $result"
}

# Input amount
echo -n "Enter the amount: "
read amount
```

```
# Validate input
if ! [[ "$amount" =~ ^[0-9]+$ ]]; then
    echo "Please enter a valid number."
    exit 1
fi

# Calculate and display denominations
calculate_denominations $amount
```