Laboratory Assignment 3

On

Design Principles of Operating System (CSE 3249)

Submitted by

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Branch : Computer Science & Engineering

Section : 2241044

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FACULTY OF ENGINEERING & TECHNOLOGY (ITER)

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Assignment 3: Shell Programming using user defined variables, arithmetic operators, conditional statements.

Objective of this Assignment:
- To learn the proper use of user defined variables and arithmetic operators in shell programming.
- To write shell script producing solution to decision making problems.

Observation:

1:

```bash
#!/bin/bash

read -p "Enter first integer: " num1
read -p "Enter second integer: " num2

add=`expr $num1 + $num2`
sub=`expr $num1 - $num2`
mul=`expr $num1 \* $num2`

if [ "$num2" -ne 0 ]; then
    div=`expr $num1 / $num2`
else
    div="undefined (division by zero)"
fi

echo "Results:"
echo "$num1 + $num2 = $add"
echo "$num1 - $num2 = $sub"
echo "$num1 * $num2 = $mul"
echo "$num1 / $num2 = $div"
```

```
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ gedit iaop.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ chmod +x iaop.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./iaop.sh
Enter first integer: 5
Enter second integer: 2
Results:
5 + 2 = 7
5 - 2 = 3
5 * 2 = 10
5 / 2 = 2
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$
```

2:

```bash
#!/bin/bash

read -p "Enter first integer: " num1
read -p "Enter second integer: " num2

echo "Sum: $(echo "$num1 + $num2" | bc)"
echo "Diff: $(echo "$num1 - $num2" | bc)"
echo "Prod: $(echo "$num1 * $num2" | bc)"
echo "Div: $(echo "$num1 / $num2" | bc)"
```

```
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ gedit faop.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ chmod +x faop.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./faop.sh
Enter first integer: 5.6
Enter second integer: 2.2
Sum: 7.8
Diff: 3.4
Prod: 12.3
Div: 2
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$
```

3:

```bash
#!/bin/bash

read -p "Enter Basic Salary: " bsal
hallowance=$(echo "0.2 * $bsal" | bc)
dallowance=$(echo "0.4 * $bsal" | bc)
gross=$(echo $hallowance + $dallowance + $bsal | bc)
echo "House allowance: $hallowance"
echo "Dearness allowance: $dallowance"
echo "Gross Salary: $gross"
```

```
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ gedit ramesh.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ chmod +x ramesh.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./ramesh.sh
Enter Basic Salary: 5000
House allowance: 1000.0
Dearness allowance: 2000.0
Gross Salary: 8000.0
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$
```

4:

```bash
#!/bin/bash
echo "Enter a 5-digit number: "
read num
sum=0
while [ $num -gt 0 ]; do
digit=$((num % 10))
sum=$((sum + digit))
num=$((num / 10))
done
echo "Sum of digits = $sum"
```

```
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ gedit sumDig.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ chmod +x sumDig.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./sumDig.sh
Enter a 5-digit number:
12345
Sum of digits = 15
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$
```
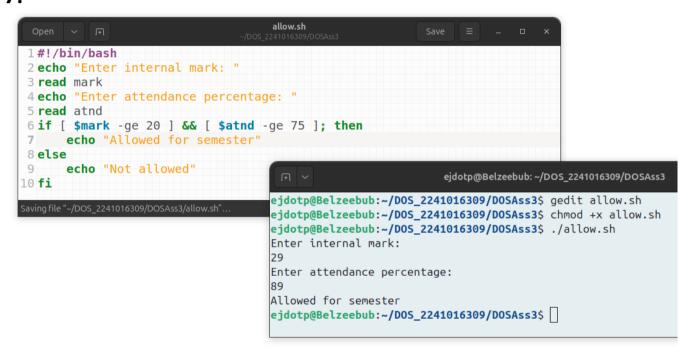
5:

```bash
#!/bin/bash
echo "Enter cost price: "
read cp
echo "Enter Selling price: "
read sp
if [ "$sp" -gt "$cp" ]; then
    profit=$((sp - cp))
    echo "Profit: $profit"
elif [ "$sp" -lt "$cp" ]; then
    loss=$((cp - sp))
    echo "Loss: $loss"
else
    echo "No Profit No Loss"
fi
```

```
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ gedit sell.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ chmod +x sell.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./sell.sh
Enter cost price:
150
Enter Selling price:
250
Profit: 100
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$
```

6:

```bash
#!/bin/bash

if [ -z "$1" ]; then
    year=$(date +%Y)
else
    year=$1
fi

if (( (year % 4 == 0 && year % 100 != 0) || (year % 400 == 0) )); then
    echo "$year is a leap year."
else
    echo "$year is not a leap year."
fi
```

leap.sh — ~/DOS_2241016309/DOSAss3

```
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ gedit leap.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ chmod +x leap.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./leap.sh
2024 is a leap year.
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./leap.sh 2012
2012 is a leap year.
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$
```

7:

```bash
#!/bin/bash
echo "Enter internal mark: "
read mark
echo "Enter attendance percentage: "
read atnd
if [ $mark -ge 20 ] && [ $atnd -ge 75 ]; then
    echo "Allowed for semester"
else
    echo "Not allowed"
fi
```

allow.sh — ~/DOS_2241016309/DOSAss3

```
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ gedit allow.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ chmod +x allow.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./allow.sh
Enter internal mark:
29
Enter attendance percentage:
89
Allowed for semester
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$
```

8:

```bash
#!/bin/bash
if [ $# -ne 3 ]; then
    echo "Please provide exactly 3 no.s"
    exit 1
fi
smallest=$1
if [ $2 -lt $smallest ]; then
    smallest=$2
fi
if [ $3 -lt $smallest ]; then
    smallest=$3
fi
echo "Smallest = $smallest"
```

small3.sh — ~/DOS_2241016309/DOSAss3

```
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ gedit small3.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ chmod +x small3.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./small3.sh
Please provide exactly 3 no.s
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./small3.sh 3 5 2
Smallest = 2
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$
```

9:

```bash
#!/bin/bash
echo "Enter a character:"
read -n 1 char
if [[ $char =~ [a-z] ]]; then
    echo "you entered a lowercase alphabet"
elif [[ $char =~ [A-Z] ]]; then
    echo "you entered a uppercase alphabet"
elif [[ $char =~ [0-9] ]]; then
    echo "you have entered a digit"
elif [[ ${#char} -ne 1 ]]; then
    echo "you have entered more than one character"
else
    echo "you entered a special symbol"
fi
```

```
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ gedit check_char.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ chmod +x  check_char.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./check_char.sh
Enter a character:
Ayou entered a uppercase alphabet
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$
```

10:

```bash
#!/bin/bash
echo "Enter a character:"
read -n 1 char
if [[ $char =~ [a-z] ]]; then
    echo "you entered a lowercase alphabet"
elif [[ $char =~ [A-Z] ]]; then
    echo "you entered a uppercase alphabet"
elif [[ $char =~ [0-9] ]]; then
    echo "you have entered a digit"
elif [[ ${#char} -ne 1 ]]; then
    echo "you have entered more than one character"
else
    echo "you entered a special symbol"
fi
```

```
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ gedit check_char.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ chmod +x  check_char.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./check_char.sh
Enter a character:
Ayou entered a uppercase alphabet
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$
```

11:

```bash
#!/bin/bash
if cmp -s "$1" "$2"; then
    echo "Files $1 and $2 have same content."
    rm "$2"
    echo "So $2 is deleted."
else
    echo "Files $1 and $2 have different content."
fi
```

```
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ gedit filechk.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ cat > f1.txt
12345
^C
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ cat > f2.txt
12345
^C
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ chmod +x filechk.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./filechk.sh
Files  and  have different content.
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./filechk.sh f1.txt f2.txt
Files f1.txt and f2.txt have same content.
So f2.txt is deleted.
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$
```

12:

```bash
#!/bin/bash
if (( $# != 3 )); then
    echo "Invalid input"
    echo "Enter input in following format: op1 operator op2"
    exit 1
fi

op1=$1
operator=$2
op2=$3

case $operator in
    +) echo "$op1 + $op2 = $((op1 + op2))" ;;
    -) echo "$op1 - $op2 = $((op1 - op2))" ;;
    x) echo "$op1 * $op2 = $((op1 * op2))" ;;
    /) echo "$op1 / $op2 = $((op1 / op2))" ;;
    %) echo "$op1 % $op2 = $((op1 % op2))" ;;
    ^) echo "$op1 ^ $op2 = $((op1 ** op2))" ;;
    *) echo "Invalid operator" ;;
esac
```

```
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ gedit calculator.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ chmod +x calculator.sh
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./calculator.sh 3 * 2
Invalid input
Enter input in following format: op1 operator op2
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./calculator.sh 3 x 2
3 * 2 = 6
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$ ./calculator.sh 3 + 2
3 + 2 = 5
ejdotp@Belzeebub:~/DOS_2241016309/DOSAss3$
```