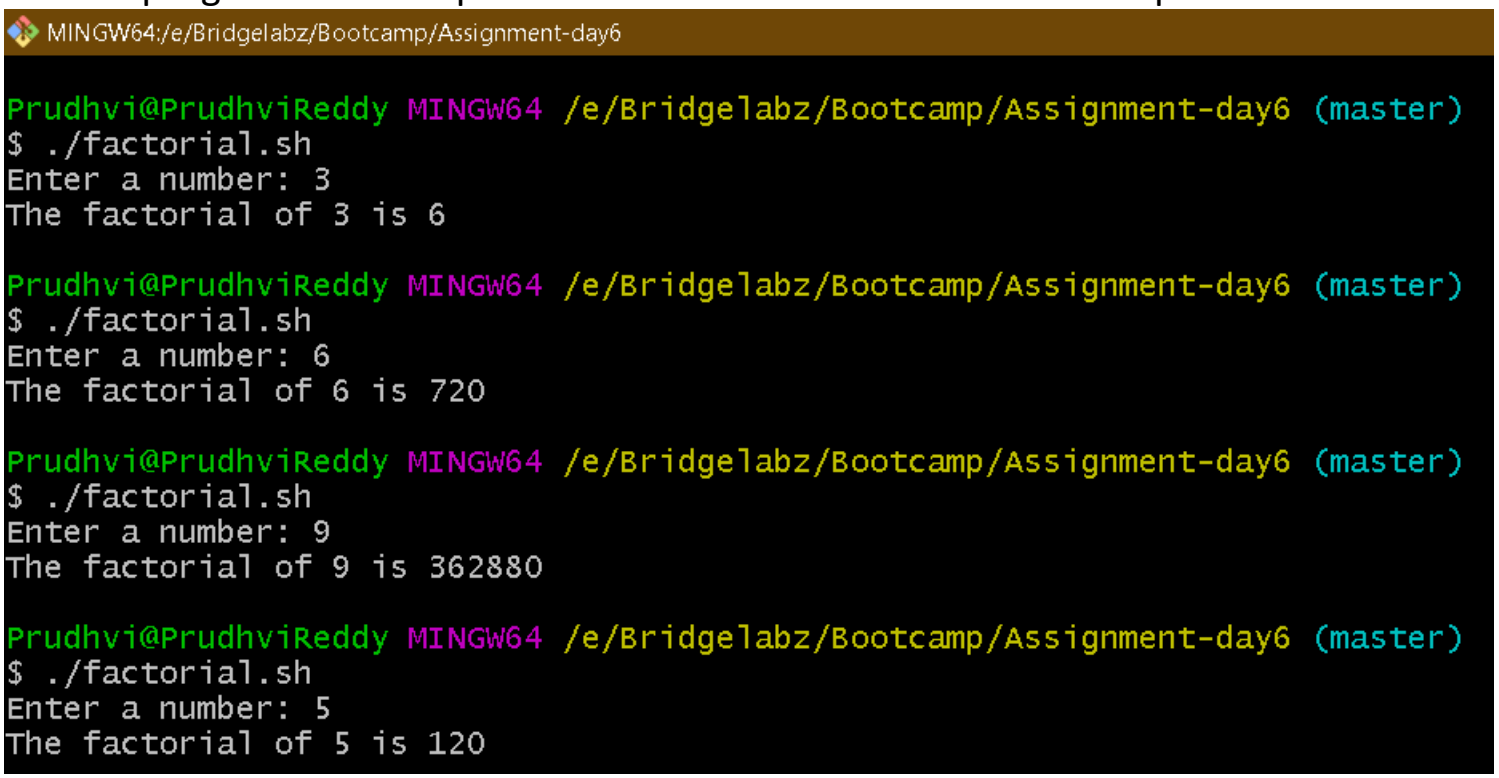
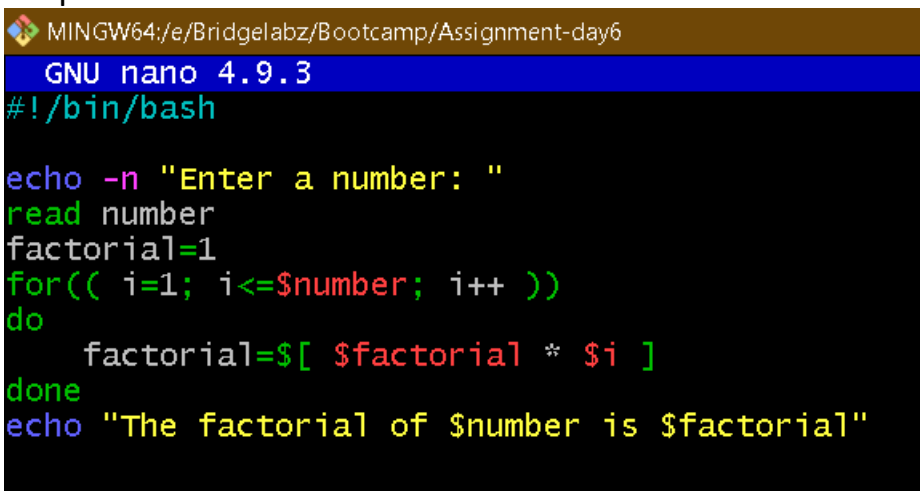
Repetition Practice Problems with for loop

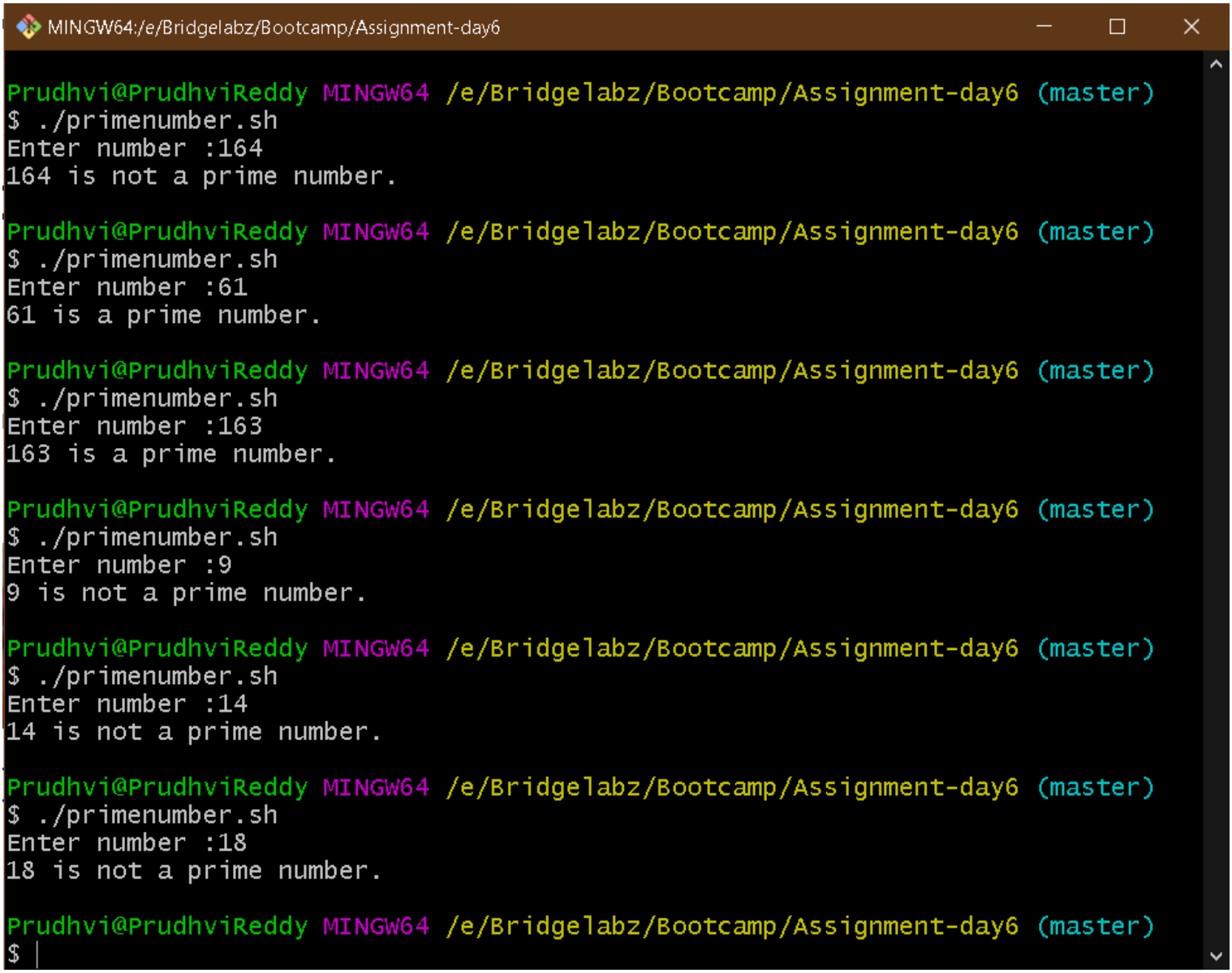
Write a program that computes a factorial of a number taken as input.



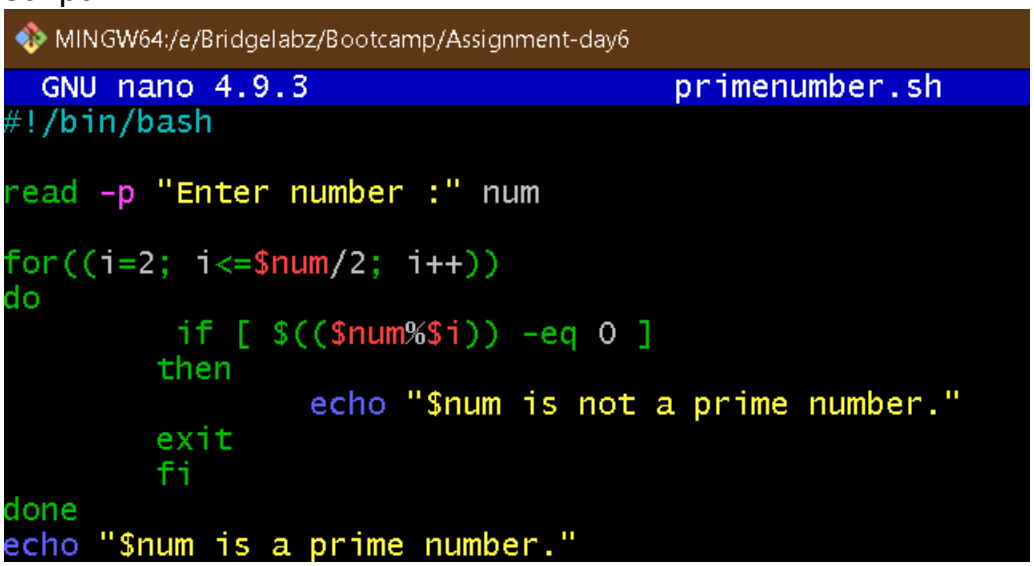
Script



Write a program that takes a input and determines if the number is a prime


MINGW64:/e/Bridgelabz/Bootcamp/Assignment-day6
Prudhvi@PrudhviReddy MINGW64 /e/Bridgelabz/Bootcamp/Assignment-day6 (master)
$ ./primenumber.sh
Enter number :164
164 is not a prime number.
Prudhvi@PrudhviReddy MINGW64 /e/Bridgelabz/Bootcamp/Assignment-day6 (master)
$ ./primenumber.sh
Enter number :61
61 is a prime number.
Prudhvi@PrudhviReddy MINGW64 /e/Bridgelabz/Bootcamp/Assignment-day6 (master)
$ ./primenumber.sh
Enter number :163
163 is a prime number.
Prudhvi@PrudhviReddy MINGW64 /e/Bridgelabz/Bootcamp/Assignment-day6 (master)
$ ./primenumber.sh
Enter number :9
9 is not a prime number.
Prudhvi@PrudhviReddy MINGW64 /e/Bridgelabz/Bootcamp/Assignment-day6 (master)
$ ./primenumber.sh
Enter number :14
14 is not a prime number.
Prudhvi@PrudhviReddy MINGW64 /e/Bridgelabz/Bootcamp/Assignment-day6 (master)
$ ./primenumber.sh
Enter number :18
18 is not a prime number.
Prudhvi@PrudhviReddy MINGW64 /e/Bridgelabz/Bootcamp/Assignment-day6 (master)
$

Script


MINGW64:/e/Bridgelabz/Bootcamp/Assignment-day6
GNU nano 4.9.3 primenumber.sh
#!/bin/bash
read -p "Enter number :" num
for((i=2; i<=$num/2; i++))
do
if [$(($num%$i)) -eq 0]
then
echo "$num is not a prime number."
exit
fi
done
echo "$num is a prime number."

Write a program that takes a command-line argument n and prints the nth harmonic number. Harmonic Number is of the form $H_n = \frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \ldots + \frac{1}{n}$

```
MINGW64:/e/Bridgelabz/Assignments/Day6
  GNU nano 4.9.3                harmo
#!/bin/bash
arr=();
read -p "Enter number : " n

for ((i=1; $i<=$n; i++))
do
        H=1/$i+
        arr+=($H)
done
echo ${arr[@]}
```

```
Prudhvi@PrudhviReddy MINGW64 /e/Bridgelabz/Assignments/Day6
$ ./harmonicnumber.sh
Enter number : 6
1/1+ 1/2+ 1/3+ 1/4+ 1/5+ 1/6+

Prudhvi@PrudhviReddy MINGW64 /e/Bridgelabz/Assignments/Day6
$ ./harmonicnumber.sh
Enter number : 9
1/1+ 1/2+ 1/3+ 1/4+ 1/5+ 1/6+ 1/7+ 1/8+ 1/9+

Prudhvi@PrudhviReddy MINGW64 /e/Bridgelabz/Assignments/Day6
$ ./harmonicnumber.sh
Enter number : 13
1/1+ 1/2+ 1/3+ 1/4+ 1/5+ 1/6+ 1/7+ 1/8+ 1/9+ 1/10+ 1/11+ 1/12+ 1/13+
```

Write a program that takes a command-line argument n and prints a table of the powers of 2 that are less than or equal to 2^n.

```
#!/bin/bash
read -p "Enter number : " n
arr=();
m=2;
for ((i=1; $i<=$n; i++))
do
        P=$(($m**$i))
        arr+=($P)
done
for a in ${arr[@]}
do
        echo $a
done
```

Extend the program to take a range of number as input and output the Prime Numbers in that range

```bash
#!/bin/bash
gen() # this generates the prime numbers
{
    x[0]=2
    for ((i=2;i<=$1;i++))
    do
        status=0
        for j in ${x[@]}
        do
            if [[ $(($i%$j)) == 0 ]]
            then
                status=1
                break
            fi
        done
        if [[ $status == 0 ]]
        then
            x[${#x[@]}]=$i
        fi
    done
    echo ${x[@]}
}

read -p "enter the range " n
temp=$(gen $n)
echo ${temp[@]}
```

```
prudhvi@PrudhviReddy:/mnt/e/Bridgelabz/Assignments/Day6/Prob01$ ./primenumberwithinrange.sh
enter the range 10
2 3 5 7
prudhvi@PrudhviReddy:/mnt/e/Bridgelabz/Assignments/Day6/Prob01$ ./primenumberwithinrange.sh
enter the range 25
2 3 5 7 11 13 17 19 23
prudhvi@PrudhviReddy:/mnt/e/Bridgelabz/Assignments/Day6/Prob01$ ./primenumberwithinrange.sh
enter the range 20
2 3 5 7 11 13 17 19
```

Write a program to compute Factors of a number N using prime factorization method

```
prudhvi@PrudhviReddy:/mnt/e/Bridgelabz/Assignments/Day6/Prob01$ ./primefactorization.sh
Enter integer : 12
[ 2 ]
[ 3 ]
prudhvi@PrudhviReddy:/mnt/e/Bridgelabz/Assignments/Day6/Prob01$ ./primefactorization.sh
Enter integer : 25
[ 5 ]
```

```
#!/bin/bash

read -p "Enter integer : " n
count=0
flag=0
for ((i=2;i<$n; i++))
do
        if [[ $n%$i -eq 0 ]]
        then
                factor=$i
                for (( j=2; j<=$factor/2; j++))
                do
                        flag=0
                        if [[ $factor%$j -eq 0 ]]
                        then
                                flag=1
                                break
                        fi
                done
                if [ $flag -eq 0 ];then
                         echo "[ $factor ]"
                         count=1
                fi
        fi
done
if [ $count -eq 0 ];then
         echo "no prime factors found except 1 and $input"
fi
```