BridgeLabz

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Programming Constructs – for Loop Repetitions

3. Repetition Statement

A repetition construct causes a group of one or more program statements to be invoked repeatedly until some end condition is met.

3. Repetition Statement Types

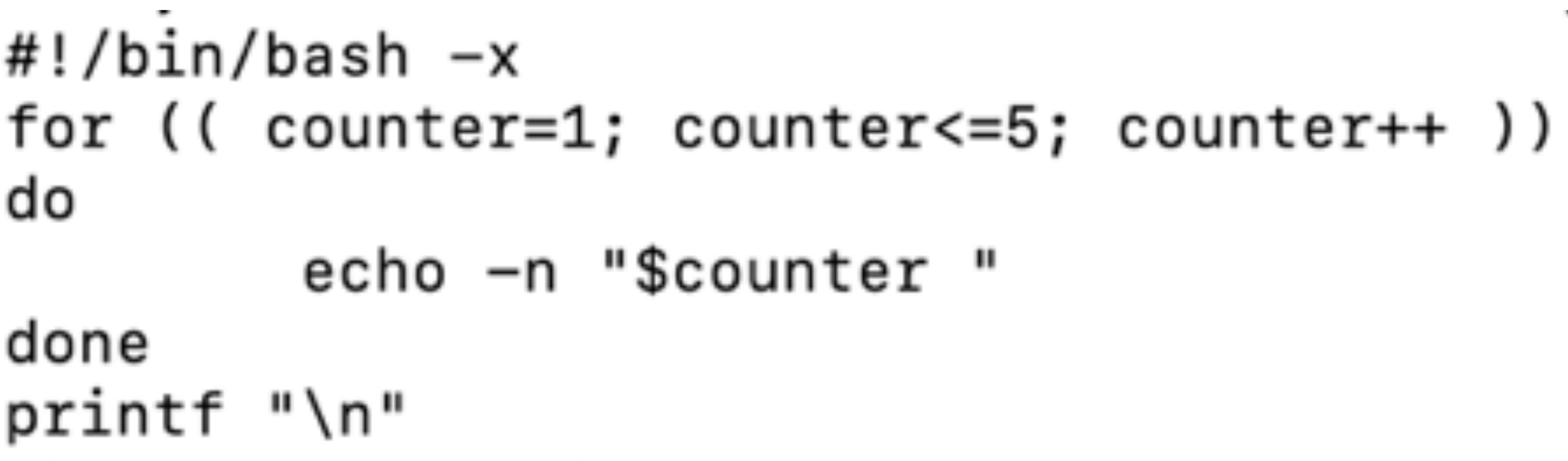
1. **Fixed count loops** - repeat a predefine number of times.

   for ((…)) do done

2. **Variable count loops** - repeat an unspecified number of times.

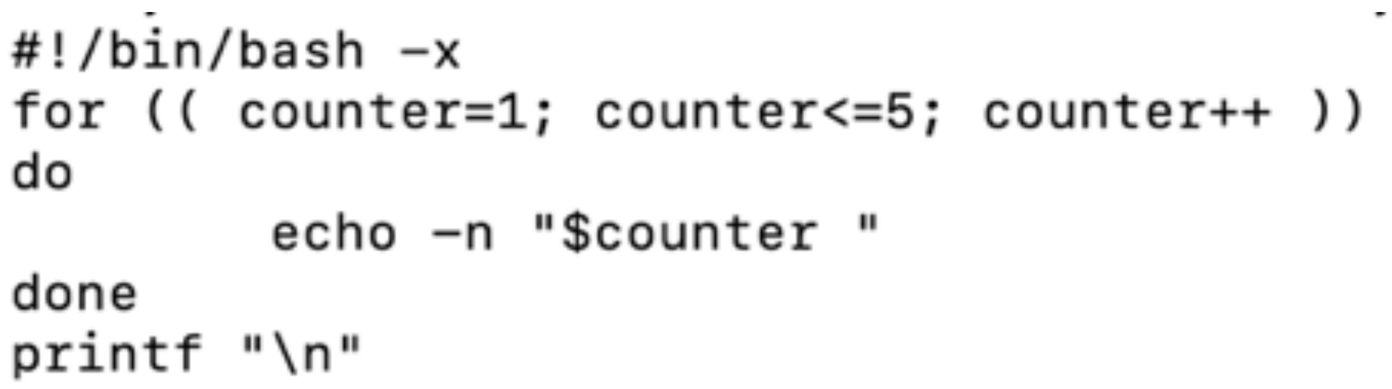
   while […] do done

for Loop Statement

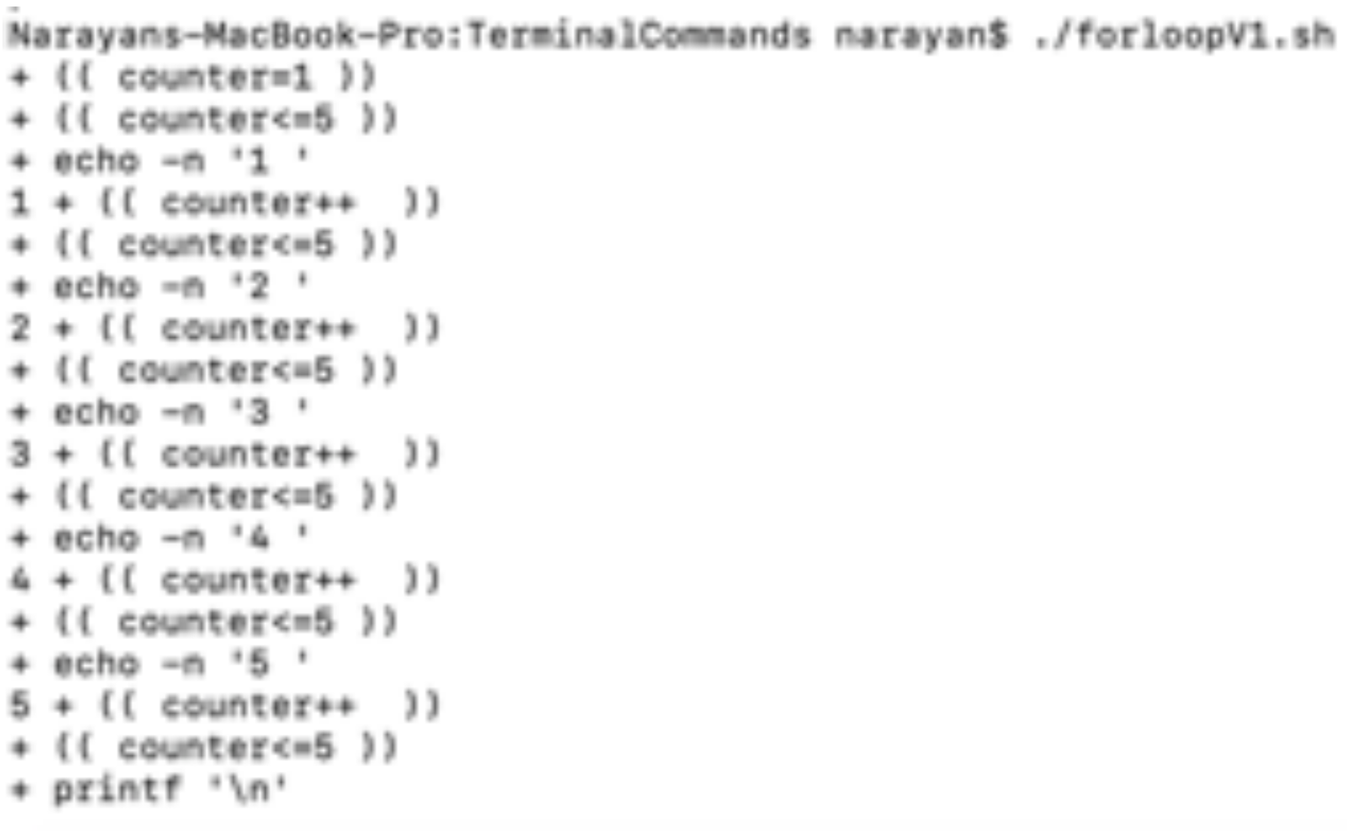


```
#!/bin/bash -x
for (( counter=1; counter<=5; counter++ ))
do
        echo -n "$counter "
done
printf "\n"
```

for Loop & Execution Statement



```
#!/bin/bash -x
for (( counter=1; counter<=5; counter++ ))
do
        echo -n "$counter "
done
printf "\n"
```

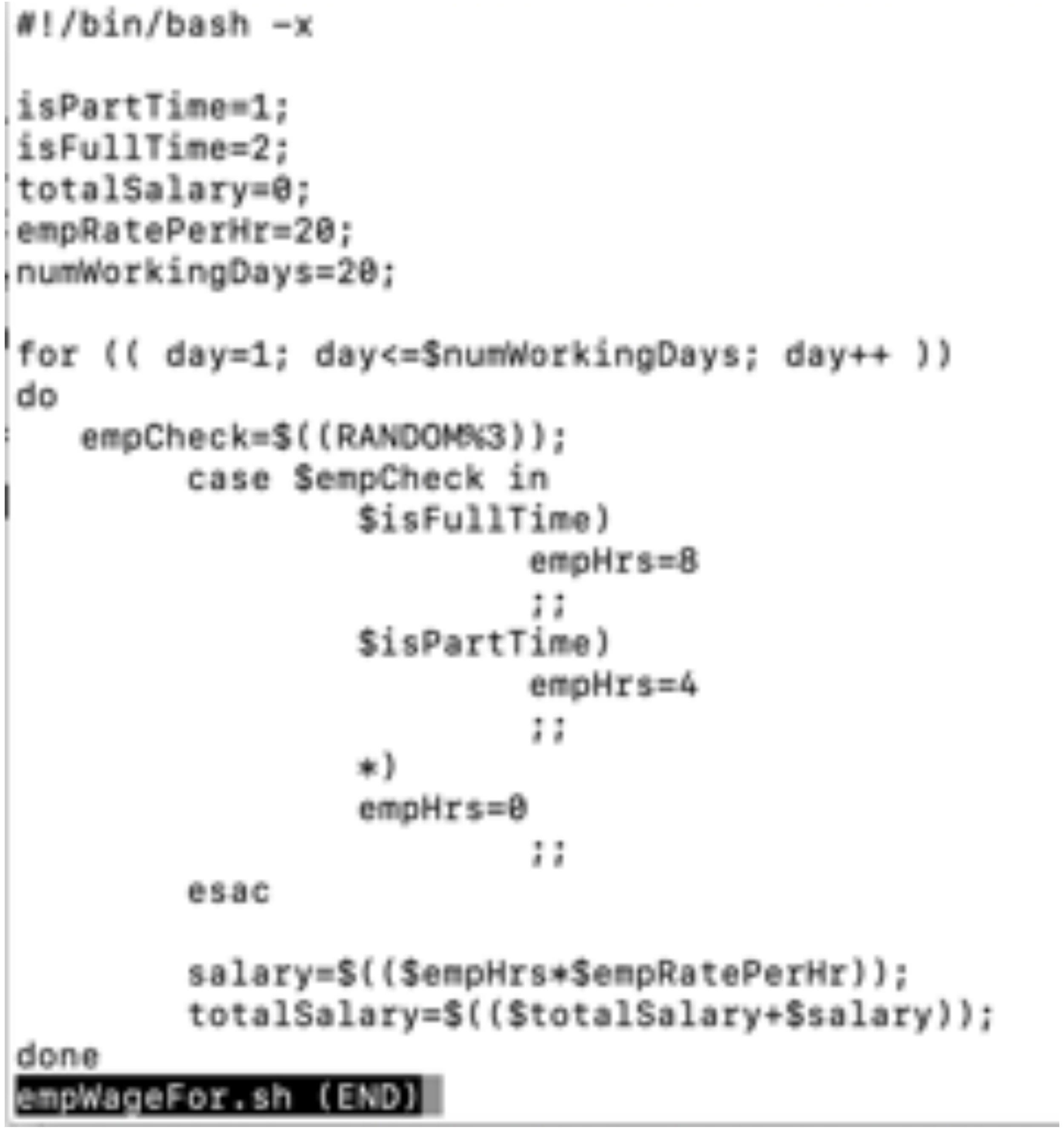


```
Narayans-MacBook-Pro:TerminalCommands narayan$ ./forloopV1.sh
+ (( counter=1 ))
+ (( counter<=5 ))
+ echo -n '1 '
1 + (( counter++  ))
+ (( counter<=5 ))
+ echo -n '2 '
2 + (( counter++  ))
+ (( counter<=5 ))
+ echo -n '3 '
3 + (( counter++  ))
+ (( counter<=5 ))
+ echo -n '4 '
4 + (( counter++  ))
+ (( counter<=5 ))
+ echo -n '5 '
5 + (( counter++  ))
+ (( counter<=5 ))
+ printf '\n'
```

UC 5

Calculating Wages for a Month

Calculating Wages for a Month



```
#!/bin/bash -x

isPartTime=1;
isFullTime=2;
totalSalary=0;
empRatePerHr=20;
numWorkingDays=20;

for (( day=1; day<=$numWorkingDays; day++ ))
do
   empCheck=$((RANDOM%3));
        case $empCheck in
                $isFullTime)
                        empHrs=8
                        ;;
                $isPartTime)
                        empHrs=4
                        ;;
                *)
                empHrs=0
                        ;;
        esac

        salary=$(($empHrs*$empRatePerHr));
        totalSalary=$(($totalSalary+$salary));
done
empWageFor.sh (END)
```

Repetition Practice Problems with for loop

1. 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.
2. Write a program that takes a command-line argument n and prints the nth harmonic number. Harmonic Number is of the form

   $$H_n = \frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \ \dots \ + \frac{1}{n}$$
3. Write a program that takes a input and determines if the number is a prime.
4. Extend the program to take a range of number as input and output the Prime Numbers in that range.
5. Write a program that computes a factorial of a number taken as input.

   5 Factorial – 5! = 1 * 2 * 3 * 4 * 5
6. Write a program to compute Factors of a number N using prime factorization method.

   Logic -> Traverse till i*i <= N instead of i <= N for efficiency.

   O/P -> Print the prime factors of number N.

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Thank You