

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
```

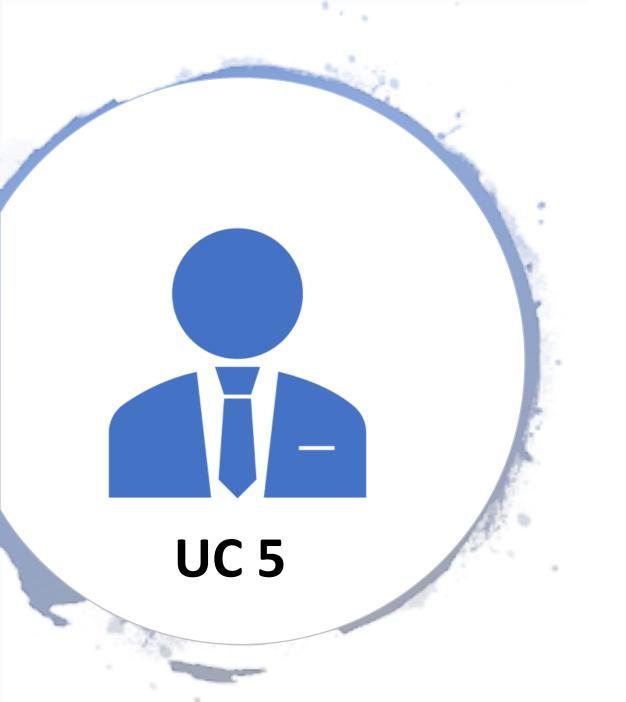
2. Variable count loops - repeat an unspecified number of times.

while [...] do done

for Loop Statement

for Loop & Execution Statement

```
#!/bin/bash -x
for (( counter=1; counter<=5; counter++ ))</pre>
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'
```



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<=$numWorkingDays; day++ ))</pre>
do
   empCheck=$((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



- 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. $5 \cdot 1 = 1 \cdot 2 \cdot 3 \cdot 4 \cdot 5$
- 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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