



# Systems Programming

Shell scripting

# Generate random numbers

- **Using the RANDOM** (generates a random number between 0 and 32767)
  - `$(((RANDOM % 10)))` Generates a random number between 0 and 9
  - `$(((RANDOM % 10)+1))` Generates a random number between 1 and 10...simply adding 1 to it
- **Using the shuf**
  - `shuf -i 0-10 -n 1` Generates a random number between 0 and 10
  - `shuf -i 0-10 -n 3` Generates 3 random number between 0 and 10

# Task

Write a script that generates a random number then ask the user to guess it. Then, count the number of guesses the user needed.

# Solution

```
#!/bin/bash
# hilow - a simple number guessing game
guess=0 # guessed by player
guesses=0 # number of guesses made
number=$((RANDOM%100)+1) # random number, 1 .. 100
while [ $guess -ne $number ] ; do
    guesses=$((guesses+1))
    echo -n "Guess #$guesses? " ; read guess
    if [ $guess -lt $number ] ; then
        echo "... bigger!"
    elif [ $guess -gt $number ] ; then
        echo "... smaller!"
    fi
done
echo "You finished the game after $guesses guess(es)"
```

# Regular expressions

- Regular expressions are specially encoded strings used as patterns for matching sets of strings
- Regular expressions are used by several different Unix commands, including **ed**, **sed**, **awk**, **grep**

Sed: Stream Editor

```
/^[/^ [Reg]ular [Ex]pression$/
```

# Syntax of sed

Range	Description	
p	Prints the line	Prints the whole text file or a specific line in it
d	Deletes the line	Deletes the whole text file or a specific line in it
s/pattern1 /pattern2/	Substitutes the first occurrence of pattern1 with pattern2.	

Substitutes specific text by another text in the whole text file

# Controlling Printing 1

TextFileForSED.txt

This is only  
a text file  
That I plan to use  
With sed  
that is a regular  
expression tool  
like grep and the others  
often used for  
wide renaming of the  
files in a specific  
directory

```
sed 'p' TextFileForSED.txt
```

Output

This is only  
This is only  
a text file  
a text file  
That I plan to use  
That I plan to use  
With sed  
With sed  
that is a regular  
that is a regular  
expression tool  
expression tool  
like grep and the others  
like grep and the others  
often used for  
often used for  
wide renaming of the  
wide renaming of the  
files in a specific directory  
files in a specific directory

# Controlling Printing 2

This is only  
a text file  
That I plan to use  
With sed  
that is a regular  
expression tool  
like grep and the others  
often used for  
wide renaming of the  
files in a specific  
directory

```
sed '1p' TextFileForSED.txt
```

This is only  
This is only  
a text file  
That I plan to use  
With sed  
that is a regular  
expression tool  
like grep and the others  
often used for  
wide renaming of the  
files in a specific  
directory



# Controlling Deletion 1

This is only  
a text file  
That I plan to use  
With sed  
that is a regular  
expression tool  
like grep and the others  
often used for  
wide renaming of the  
files in a specific  
directory

```
sed 'd' TextFileForSED.txt
```

# Controlling Deletion 2

This is only  
a text file  
That I plan to use  
With sed  
that is a regular  
expression tool  
like grep and the others  
often used for  
wide renaming of the  
files in a specific  
directory

```
sed '3d' TextFileForSED.txt
```

This is only  
a text file  
With sed  
that is a regular  
expression tool  
like grep and the others  
often used for  
wide renaming of the  
files in a specific  
directory

# Substitution using sed

This is only  
a text **file**

```
cat TextFileForSED.txt | sed 's/file/CS415/'
```

That I plan to use  
With sed  
that is a regular  
expression tool  
like grep and the others  
often used for  
wide renaming of the  
**files** in a specific  
directory

This is only  
a text **CS415**  
That I plan to use  
With sed  
that is a regular  
expression tool  
like grep and the others  
often used for  
wide renaming of the  
**CS415s** in a specific  
directory

# Special characters useful in regular expressions

Character	Description
<code>^</code>	Matches the beginning of lines.
<code>\$</code>	Matches the end of lines.
<code>.</code>	Matches any single character.
<code>*</code>	Matches zero or more occurrences of the previous character
<code>[chars]</code>	Matches any one of the characters given in chars, where chars is a sequence of characters. You can use the - character to indicate a range of characters.

# Substitution using sed

This is only  
a text **file**

```
cat TextFileForSED.txt | sed 's/file$/CS415/'
```

That I plan to use  
With sed  
that is a regular  
expression tool  
like grep and the others  
often used for  
wide renaming of the  
**files** in a specific  
directory

This is only  
a text **CS415**  
That I plan to use  
With sed  
that is a regular  
expression tool  
like grep and the others  
often used for  
wide renaming of the  
**files** in a specific  
directory

# Substitution using sed

This is only  
a text **file**

```
cat TextFileForSED.txt | sed 's/^file/CS415/'
```

That I plan to use  
With sed  
that is a regular  
expression tool  
like grep and the others  
often used for  
wide renaming of the  
**files** in a specific  
directory

This is only  
a text **file**  
That I plan to use  
With sed  
that is a regular  
expression tool  
like grep and the others  
often used for  
wide renaming of the  
**CS415s** in a specific  
directory

# Substitution using sed

This is only  
a text file

```
cat TextFileForSED.txt | sed 's/^w/CS/'
```

That I plan to use

**W**ith sed  
that is a regular  
expression tool  
like grep and the others  
often used for  
**w**ide renaming of the  
files in a specific  
directory

This is only  
a text file

That I plan to use

**W**ith sed  
that is a regular  
expression tool  
like grep and the others  
often used for  
**CS**ide renaming of the  
files in a specific  
directory

# Substitution using sed

i: case insensitive

This is only  
a text file

```
cat TextFileForSED.txt | sed 's/^w/CS/i'
```

That I plan to use

**W**ith sed  
that is a regular  
expression tool  
like grep and the others  
often used for  
**w**ide renaming of the  
files in a specific  
directory

This is only  
a text file

That I plan to use

**CS**ith sed  
that is a regular  
expression tool  
like grep and the others  
often used for  
**CS**ide renaming of the  
files in a specific  
directory