

## Chapter 6

# Functions

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## Overview

- ▣ Built-in Functions
- ▣ User Defined Functions

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## Lesson: Built-in Functions

- ▣ Arithmetic Functions
- ▣ String Functions
- ▣ More String Functions
- ▣ The system Function

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## Arithmetic Functions

Function	Value returned
<code>atan2(y,x)</code>	arctangent of $y/x$ in radians in the range $[-\pi, \pi]$
<code>cos(x)</code>	cosine of $x$ in radians
<code>sin(x)</code>	sine of $x$ in radians
<code>exp(x)</code>	exponential function of $x$
<code>log(x)</code>	natural logarithm of $x$
<code>sqrt(x)</code>	square root of $x$
<code>int(x)</code>	$x$ truncated to an integer
<code>rand()</code>	random number between 0 and 1
<code>srand([x])</code>	Set the seed value for <code>rand</code> to $x$ or use the time of day if $x$ is omitted.

```
x = cos(y)
print cos(log(rand()))
```

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## String Functions

Function	Value returned
<code>length([s])</code>	Length of $s$ or $$0$ (if $s$ not present)
<code>index(s,t)</code>	First position of string $t$ in $s$ , or 0 if not present
<code>match(s, ere)</code>	Test if $s$ contains $ere$ , or 0 if not. Sets <code>RSTART</code> and <code>RLENGTH</code>
<code>split(s,a[,fs])</code>	Split $s$ into array $a$ , using field separator $fs$ (or <code>FS</code> , if not present)
<code>toupper(s)</code>	Uppercase string $s$
<code>tolower(s)</code>	Lowercase string $s$

```
echo "awk programming course" | awk '{
  print length()
  print index($0, "course")
  print "awk" in position:', match($0,"awk") }'
```

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## More String Functions

Function	Value returned
<code>substr(s,p[,n])</code>	Substring of $s$ starting at position $p$ and length $n$
<code>sprintf(f, list)</code>	Format $list$ according to format string $f$
<code>sub(ere,s,[t])</code>	Substitute $s$ for first match of $ere$ in $t$ or $$0$ (if $t$ not present). Return number of substitutions
<code>gsub(ere,s,[t])</code>	Substitute $s$ for all matches of $ere$ in $t$ or $$0$ (if $t$ not present). Return number of substitutions.

```
echo "shell programming course" | awk '{
  print "awk", substr($0,6) }'

echo "hello world" | awk '{
  numch = gsub("l","w")}'

awk '{sub(/[0-9][0-9][0-9]/, "&"), $3; print}'
phonenumber
```

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## The system Function

- You can access operating system commands from within an awk

### Syntax:

```
system("command")
system("command-part1" awk_var "command-part2")
```

### Example:

```
BEGIN {
  if (system("[ -r /tmp/junk ]") == 0 )
    print "junk is readable"
  else print "/tmp/junk is not readable"
}
```

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## Lesson: User Defined Functions

### Syntax:

```
function name([parameter, ...]) { statements }
```

- Function definition can be anywhere in awk script
- Function can return value by using return statement

```
print fred(1,2,"abc")
function fred(a, b, c) {
  print c, b, a
  return a
}
```

- Function parameters can be used as local variables

```
function foo(a,b,c,x,y,z) {
  print a,b,c; x=a; y=b; z=c; print x,y,z }
foo(1,2,3)
```

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## Review Exercises



- Complete the exercises from the Learning Guide

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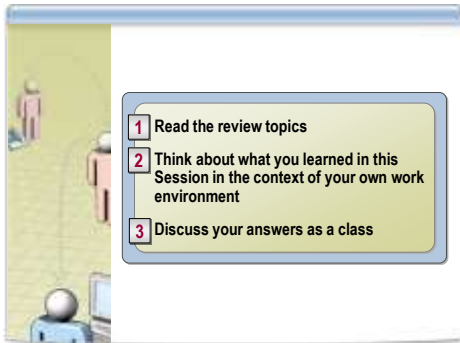
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**Topics for Review**

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