KEN'S TCL/Tk NOTES

Quoting w/ double quotes

spaces,tabs,newlines,semicolons are
treated as ordinary chars
set msg "egg: ..."

% set currency(France) franc
franc
% set "currency(Great Britain)" pound

Quoting w/ braces

1) ALL special chars loose meaning, and
its taken verbatim
set msg {eggs: ... }
2) defer evaluation so it can be passed
as an argument (or a group with
delimiters)

Decisions:

```
if { $x < 0 } {
  set x 0
}

if { $x < 0 } {
   …
} elseif {$x = = 0} {
   …
} elseif { $x = = 1} {
   …
} else {
   …
}
```

```
switch $x {
 a {incr t1}
 b {incr t2}
 c {incr t3}
}
```

Loops:

```
while { $i  >= 0 } {
  lappend b [lindex $a $i ]
  incr i
}
```

```
for { set i  0 }  { $i <= 10 }  { incr i 1 } {
  …
}
```

Iteration

```
set a {1 2 3 4 5}
1 2 3 4 5
foreach i $a { set b $a }
set b
1 2 3 4 5
```

a second way to iterate: (p. 128)

```
% set a
1 2 3 4 5
% foreach i [array names a] {
   set b $a($i) }
% set b
1 2 3 4 5
```

Arrays:

```
% set currency(France) franc
franc
% set "currency(Great Britain)" pound
pound
% set currency(Germany) mark
mark
% array names currency
{Great Britain} Germany France
```

Lists:
set x list { a b c } { d e } f {g h i }
llength {{a b c} {d e} f {g h i} } OR x
=> 4
string length "sample string"
=> 13

set x {a b c}
set y {d e}
set z "$x $y"   OR   set z [concat $x $y]
=> a b c d e

lappend maintains list structure
   lappend a $b $c <= *different!*
concat   flattens list structure
   set z [concat $a $b]

Indexing Lists

lindex {john anne mary jim} 1
=> anne
lindex { a b {c d e} f } 2
=> c d e
set x {a b {c d} e}
linsert $x 2 x y z
=> a b x y z {c d} e
lreplace x 3 3
=> a b x z {c d} e
lreplace x 1 2 {w x} y z
=> a {w x} y z z {c d} e
lrange x 2 3
=> y z

Searching Lists

set x {john anne mary jim}
search $x mary
=> 2
serch -glob $x a*   *-regexp -exact*
=> 1
search $x phil
=> -1

Sorting Lists
lsort {john anne mary jim}
lsort -increasing $x
lsort -decreasing $x
lsort -integer {10 5 12 3}

Two Lists
concat {a b c} {d e} f {g h i}
=> a b c d e f g h i
set x {a b c d e f g h i}
lappend x q r {s t} OR set x "$x [list ..]
=> a b c d e f g h i x q r {s t}

Split and join
set y /usr/local/bin
split $y /
=> usr local bin

join $y /
=> usr/local/bin
join [concat {} $y] /
=> /usr/local/bin

to split on whitespace use:
scan $aString "%s %s %s" var1 var2 var3

Stings
string first th "There is the tub"
=> 9
string first xy "...
=> -1

[   ]
      Must have a command on the left inside the brackets

eval:

      Must be followed by a command.

          Is used for creating and evaluating Tcl scripts. It accepts any number of arguments concatenates them with separator spaces, and executes the result as a Tcl script. It forces another level of parsing. (p. 77-78)

expr:

      Must be followed by a numeric expression.

●

      set x 4
      set y 5

      eval {$x = = $y }   *invalid command name "4"*
      eval [$x = = $y]   *invalid command name "4"*

      expr { $x = = $y }   *0*
      expr [$x = = $y]   *invalid command name "4"*

      expr [join $x +]   *the list becomes the command*

●

      set x 4   *4 is stored as a character string*

      set y [$x + 10]   *invalid command name "4"*

      set y { $x + 10 }   *$x + 10*

      eval $y   *invalid command name "4"*
      eval {$y}   *invalid command name "$x + 10"*

      expr [$y]   invalid command name "$x + 10"
      eval [$y]   invalid command name "$x + 10"

      expr $y   14
      expr {$y}   *$x + 10*

      set y [eval $x + 10]   *invalid command name "4"*

      set y [expr $x + 10]   *14*

Global Arrays (an example needed to understand the datahub)
constructing a global array name, then setting an array element, e.g.

>   set spname HPGEM
>   global $spname
>   set ${spname} (EQUIP) 1

Compund Boolean Evaluations

Commands like if, for, and while use the expr command internally for evaluating boolean
arguments, so you don't need to invoke expr explicitly.

To turn this into a compound IF statement, you must code the expr's; e.g.:

```
 if { $s1 >= 0 } {

    if { $f1 == [expr $s1 + 2] } {


     }
 }
```

Gets turned into a compound if as follows:

```
 if {  [expr {$s1 >= 0}] && [expr {$f1 == [expr $s1 + 2]}]  }  {

 }
```

```
% set s1 [string first S $line]
4
% set f1 [string first F $line]
6

% expr [$s1 >= 0]
invalid command name "4"

% eval [$s1 >= 0]
invalid command name "4"

% [$s1 >= 0]
invalid command name "4"
```

% **expr {$s1 >= 0}**

Misc Ousterhout Book Notes
- The open brace must be on the same line as the preceeding portion of the command
- Tcl variables ARE case sensitive
- a leading zero means octal; e.g.: 050 means octal 50, 0x50 means hex 50

- The first character that is not a letter, digit, or underscore, terminates the name
    - To get around this; e.g.: have a variable 1.5m you would:

      set size 1.5   *1.5*
      set y ${size}m   *1.5m*

          To create   1.5m as an argument (the "." is illegal for a name)
                set size 1.5
                foo ${size}m

- defaulted proc arguments, if any, must be the last arguments for a procedure.

Case Insensitive lsearch

```
% set aList [list billy john Ken]
billy john Ken
% set aValue KEN
KEN
% lsearch -regexp $aList (?i)^${aValue}$
2
%
```

TK

Populating a Listbox

```
$aListBox insert end $aLine
```

Getting the Listbox Selection

```
set theIndicies [$aListBox curselection]    ;# curselection is a keyword
if { [llength $theIndicies] > 0 } {
 foreach anIndex $theIndicies {
   set theLine [$aListBox get $anIndex]
 }
}
```

Clearing a Listbox Selection

```
$aListBox selection clear 0 end
```

Tcl Symbolic Colors

SystemButtonFace
gray60 gray70 gray80 gray85 gray90 gray95 \
   snow1 snow2 snow3 snow4 seashell1 seashell2 \
   seashell3 seashell4 AntiqueWhite1 AntiqueWhite2 AntiqueWhite3 \
   AntiqueWhite4 bisque1 bisque2 bisque3 bisque4 PeachPuff1 \
   PeachPuff2 PeachPuff3 PeachPuff4 NavajoWhite1 NavajoWhite2 \
   NavajoWhite3 NavajoWhite4 LemonChiffon1 LemonChiffon2 \
   LemonChiffon3 LemonChiffon4 cornsilk1 cornsilk2 cornsilk3 \
   cornsilk4 ivory1 ivory2 ivory3 ivory4 honeydew1 honeydew2 \
   honeydew3 honeydew4 LavenderBlush1 LavenderBlush2 \
   LavenderBlush3 LavenderBlush4 MistyRose1 MistyRose2 \
   MistyRose3 MistyRose4 azure1 azure2 azure3 azure4 \
   SlateBlue1 SlateBlue2 SlateBlue3 SlateBlue4 RoyalBlue1 \
   RoyalBlue2 RoyalBlue3 RoyalBlue4 blue1 blue2 blue3 blue4 \
   DodgerBlue1 DodgerBlue2 DodgerBlue3 DodgerBlue4 SteelBlue1 \
   SteelBlue2 SteelBlue3 SteelBlue4 DeepSkyBlue1 DeepSkyBlue2 \
   DeepSkyBlue3 DeepSkyBlue4 SkyBlue1 SkyBlue2 SkyBlue3 \
   SkyBlue4 LightSkyBlue1 LightSkyBlue2 LightSkyBlue3 \
   LightSkyBlue4 SlateGray1 SlateGray2 SlateGray3 SlateGray4 \
   LightSteelBlue1 LightSteelBlue2 LightSteelBlue3 \
   LightSteelBlue4 LightBlue1 LightBlue2 LightBlue3 \
   LightBlue4 LightCyan1 LightCyan2 LightCyan3 LightCyan4 \
   PaleTurquoise1 PaleTurquoise2 PaleTurquoise3 PaleTurquoise4 \
   CadetBlue1 CadetBlue2 CadetBlue3 CadetBlue4 turquoise1 \
   turquoise2 turquoise3 turquoise4 cyan1 cyan2 cyan3 cyan4 \

DarkSlateGray1 DarkSlateGray2 DarkSlateGray3 \
DarkSlateGray4 aquamarine1 aquamarine2 aquamarine3 \
aquamarine4 DarkSeaGreen1 DarkSeaGreen2 DarkSeaGreen3 \
DarkSeaGreen4 SeaGreen1 SeaGreen2 SeaGreen3 SeaGreen4 \
PaleGreen1 PaleGreen2 PaleGreen3 PaleGreen4 SpringGreen1 \
SpringGreen2 SpringGreen3 SpringGreen4 green1 green2 \
green3 green4 chartreuse1 chartreuse2 chartreuse3 \
chartreuse4 OliveDrab1 OliveDrab2 OliveDrab3 OliveDrab4 \
DarkOliveGreen1 DarkOliveGreen2 DarkOliveGreen3 \
DarkOliveGreen4 khaki1 khaki2 khaki3 khaki4 \
LightGoldenrod1 LightGoldenrod2 LightGoldenrod3 \
LightGoldenrod4 LightYellow1 LightYellow2 LightYellow3 \
LightYellow4 yellow1 yellow2 yellow3 yellow4 gold1 gold2 \
gold3 gold4 goldenrod1 goldenrod2 goldenrod3 goldenrod4 \
DarkGoldenrod1 DarkGoldenrod2 DarkGoldenrod3 DarkGoldenrod4 \
RosyBrown1 RosyBrown2 RosyBrown3 RosyBrown4 IndianRed1 \
IndianRed2 IndianRed3 IndianRed4 sienna1 sienna2 sienna3 \
sienna4 burlywood1 burlywood2 burlywood3 burlywood4 wheat1 \
wheat2 wheat3 wheat4 tan1 tan2 tan3 tan4 chocolate1 \
chocolate2 chocolate3 chocolate4 firebrick1 firebrick2 \
firebrick3 firebrick4 brown1 brown2 brown3 brown4 salmon1 \
salmon2 salmon3 salmon4 LightSalmon1 LightSalmon2 \
LightSalmon3 LightSalmon4 orange1 orange2 orange3 orange4 \
DarkOrange1 DarkOrange2 DarkOrange3 DarkOrange4 coral1 \
coral2 coral3 coral4 tomato1 tomato2 tomato3 tomato4 \
OrangeRed1 OrangeRed2 OrangeRed3 OrangeRed4 red1 red2 red3 \
red4 DeepPink1 DeepPink2 DeepPink3 DeepPink4 HotPink1 \
HotPink2 HotPink3 HotPink4 pink1 pink2 pink3 pink4 \
LightPink1 LightPink2 LightPink3 LightPink4 PaleVioletRed1 \
PaleVioletRed2 PaleVioletRed3 PaleVioletRed4 maroon1 \
maroon2 maroon3 maroon4 VioletRed1 VioletRed2 VioletRed3 \
VioletRed4 magenta1 magenta2 magenta3 magenta4 orchid1 \
orchid2 orchid3 orchid4 plum1 plum2 plum3 plum4 \
MediumOrchid1 MediumOrchid2 MediumOrchid3 MediumOrchid4 \
DarkOrchid1 DarkOrchid2 DarkOrchid3 DarkOrchid4 purple1 \
purple2 purple3 purple4 MediumPurple1 MediumPurple2 \
MediumPurple3 MediumPurple4 thistle1 thistle2 thistle3 \
thistle4

Color Name	RGB Code	Sample
red	ff0000	
orange red	ff4500	
orange	ff7f00	
yellow	ffff00	
green	00ff00	
forest green	228b22	
cyan	00ffff	
light sea green	20b2aa	
blue	0000ff	
cornflower blue	6495ed	
medium blue	3232cd	
purple	a020f0	
hot pink	ff69b4	
magenta	ff00ff	
white	ffffff	
light gray*	d3d3d3	
gray*	bebebe	
dark gray*	a9a9a9	
dim gray*	696969	
black	000000	

e.g.: -fg #d3d3d3

Color Name	RGB Code	Sample
aquamarine	7fffd4	
black	000000	
blue	0000ff	
brown	a52a2a	
chartreuse	7fff00	
coral	ff7f50	
cornflower blue	6495ed	
cyan	00ffff	
dark cyan	008b8b	
dark gray*	a9a9a9	
dark green	006400	
dark khaki	bdb76b	
dark magenta	8b008b	
dark olive green	556b2f	
dark red	8b0000	
dark slate blue	483d8b	
dark slate gray*	2f4f4f	
deep pink	ff1493	
deep sky blue	00bfff	
dim gray*	696969	
dodger blue	1e90ff	

firebrick	b22222	
forest green	228b22	
gold	ffd700	
goldenrod	daa520	
gray*	bebebe	
green	00ff00	
hot pink	ff69b4	
khaki	f0e68c	
light blue	add8e6	
light gray*	d3d3d3	
light green	90ee90	
light sea green	20b2aa	
lime green	32cd32	
magenta	ff00ff	
medium blue	3232cd	
medium purple	9370db	
navy blue	000080	
olive drab	6b8e23	
orange red	ff4500	
orange	ff7f00	
orchid	da70d6	
pink	ffc0cb	

plum	dda0dd	
purple	a020f0	
red	ff0000	
rosy brown	bc8f8f	
salmon	fa8072	
sandy brown	f4a460	
sea green	2e8b57	
sienna	a0522d	
sky blue	87ceeb	
slate gray*	708090	
spring green	00ff7f	
steel blue	4682b4	
tan	d2b48c	
turquoise	40e0d0	
violet red	d02090	
white	ffffff	
yellow	ffff00	

green1,green2,green3
yellow1,yellow2,yellow3
red1,red2,red3
pink1,pink2,pink3
slategray1,slategray2,slategray3
blue1,blue2,blue3
lightblue1,lightblue2,lightblue3

26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47