Chapter 10 Character Strings

10.1 String Construction

In MATLAB, text is stored as character strings, or strings for short. Strings are numerical arrays of ascii values which are displayed as the equivalent characters. Strings are created by enclosing text within single quotes.

Example 10.1.1

```
clear
s=' Hello there.'
x=size(s)
greeting='Welcome to the University of Central Florida!'
y=size(greeting)
whos
```

```
s =
 Hello there.

x =  1    13

greeting =
Welcome to the University of Central Florida!

y =  1    45

  Name           Size         Bytes  Class

  greeting       1x45            90  char array
  s              1x13            26  char array
  x              1x2             16  double array
  y              1x2             16  double array

Grand total is 62 elements using 148 bytes
```

The elements of a string array are the individual characters, each of which requires 2 bytes of storage compared to 8 bytes for elements in numerical, i.e. double arrays. The ascii representation of a string is obtained by making it the argument of the function `'double'`. The functon 'char' restores the character string.

Example 10.1.2

```
s1='text are character strings'
size_s1=size(s1)
z=double(s1) % Convert string to ascii representation
size_z=size(z)
s2=char(z) % Convert numerical array of ascii values back to string
s3=char(100:107) % Convert ascii values 100-107 to characters
```

```
s1 =
text are character strings
```

```
size_s1 =  1    26

z =
  Columns 1 through 12
   116   101   120   116    32    97   114   101    32    99   104    97
  Columns 13 through 24
   114    97    99   116   101   114    32   115   116   114   105   110
  Columns 25 through 26
   103   115

size_z =  1    26

s2 =
text are character strings

s3 =
defghijk
```

Strings can be addressed and manipulated the same as arrays. Strings are also concatenated the same as arrays.

Example 10.1.3

```
s1='Greetings sport fans.'
word2=s1(11:15)
s2='baseball'
s3=['Greetings ' s2 ' fans.']
s4=s3'

s1 =
Greetings sport fans.

word2 =
sport

s2 =
baseball

s3 =
Greetings baseball fans.

s4 =
G
r
e
e
t
i
n
g
s

b
a
s
e
```

```
b
a
l
l

f
a
n
s
.
```

To display a string without printing its name, the function 'disp( )' with the string variable name as argument is used.

Example 10.1.4

```
s1='Joe said ''Have a nice day'' '
disp(' ')
disp(s1)
disp('  ')
disp('Happy Birthday')

s1 =
Joe said 'Have a nice day'

Joe said 'Have a nice day'

Happy Birthday
```

Character strings arrays can have more than one row provided each row is a string with the same number of elements (characters).

Example 10.1.5

```
list=['Harold Klee';'Chris Bauer';'Joe Smith  '];
     % Two blanks are added to the end of Joe Smith to make it 1 - 11,
     % the same size as strings Harold Klee and Chris Bauer
disp(list)
size_list=size(list)

Harold Klee
Chris Bauer
Joe Smith

size_list =  3    11
```

The MATLAB function 'char( )' is also used to create multiple row string arrays from individual strings of different lengths. The function 'strcat( )' is used to horizontally concatenate string arrays with the same number of rows.