
```
% TDI examples from tutorial
```

```
% connect to a server either using mdsopen
% or mdsconnect.
```

```
% First with connect, mdsconnect must have a single
% colon between the server and port name.
```

```
mdsconnect('luna.pppl.gov:8501')
mdsopen('nstx',104500)
tm1 = mdsvalue('\tminus1');
```

```
mdsvalue('\tminus1*10^-2')
```

```
mdsvalue('(abs(\tminus1)+1)^2')
```

```
mdsdisconnect()
```

```
% With mdsopen you can include the shot number (or not).
% Mdsopen must have three (3) colons between the server
% and port name.
mdsopen('luna.pppl.gov:::8501')
```

```
% now you can use mdsopen with a tree and a shot
mdsopen('nstx',104500)
tm1 = mdsvalue('\tminus1');
tm1
```

```
mdsvalue('\tminus1*10^-2')
```

```
mdsvalue('(abs(\tminus1)+1)^2')
```

```
% you can use tags that return arrays (e.g., \ip in the wf tree)
```

```
plot(mdsvalue('\wf::ip/1000'))
```

```
% you can make assignments inside of tdi. these variable names
% must begin with an underscore
```

```
dummy = mdsvalue('_ip = \wf::ip/1000');
```

```
% now _ip is a tdi variable
```

```
mdsvalue('maxval(_ip)')
```

```
mdsvalue('maxval(cos(_ip))')
```

```
% there is interger arithmetic inside of tdi
mdsvalue('_val = 7/4')
```

```
mdsvalue('_val = 7/float(4)')
```

```
% there are intrinsics

mdsvalue('$PI')

mdsvalue('$SHOT-1')

% GETNCI is useful to find node characteristics
% This finds all nodes with IP in the name

t = mdsvalue('_t=getnci("...*IP*", "fullpath", "ANY")');

% How about this one
CHI_NAMES = mdsvalue('_chi=getnci("...*CHI*", "fullpath", "ANY")');

% You can find tag names similarly

nodesFound = mdsvalue('_n=findtags($)', '*IP*');

CHI_nodes = mdsvalue('_n=findtags($)', '*CHI*');

% arrays can be defined explicitly

mdsvalue('_a = [6,5,4,3,2,1]')

mdsvalue('_a = (6:1:-1)')

% arrays can be used as arguments in functions or expressions
% arrays can be subscripted. note that the base index is 0.

% location of minimum value of a
mdsvalue('minloc(_a)')

% minimum value of a
mdsvalue('_a[ minloc(_a) ]')

% highest index in a
mdsvalue('ubound(_a)')

% some statistical functions
mdsvalue('mean(_a * 10)')

% array addressing
mdsvalue('_a[5]')

% sub-array addressing
mdsvalue('mean(_a[0:2])')

% you can't use an array subscript on the "left hand side" of
% an equal sign in TDI e.g., the following will generate an error
mdsvalue('_a[5] = 3')
```

```
% you can build array like in Matlab with BUILD_RANGE
mdsvalue('BUILD_RANGE(1,17,4)')

% or with the short-hand
mdsvalue('(1:17:4)')

% you can do the same to 'decimate-in-time' data
% before it is returned to your program
mdsopen('wf',109070)
sparseData = mdsvalue('data(\ip)[0:*:10]');

% signals are more complicated
mdsopen('particles',113458)
frame = mdsvalue('data(\sflip_3d)[*:*:10]');

% for non-signals data() is not required
sparseTime = mdsvalue('dim_of(\ip)[0:*:10]');

% note that $VALUE is a TDI Constant Intrinsic used in the data
% field of a signal to mean the raw data
```