## Demo document with computer code

HPL

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## 1 Data file

Suppose we have some data in a file typeset with !bc dat:

```
R
                        C
                                  D
                                              E
                     -0.3427
-0.5253
          -0.9315
                                -0.1613
                                           -0.8472
-0.9740
          -0.2558
                     -0.5622
                                -0.7635
                                           -0.0914
                     -0.4818
0.9216
          0.7702
                                0.2155
                                            0.2967
```

## 2 Complete program and terminal output

The following program (which breaks a page) reads the data in the file and performs analysis (typeset with !bc pypro):

```
#!/usr/bin/env python
import numpy as np
def readfile(filename):
    """Read tabular data from file and return as numpy array."""
    f = open(filename, 'r')
    data = [] # list of rows in table
for line in f:
         if line.startswith('#'):
         continue # drop comment lines
numbers = [float(w) for w in line.split()]
         data.append(numbers)
    return np.array(data)
def analyze(data):
    """Return statistical measures of an array data."""
    return np.mean(data), \
             np.std(data),
             np.corrcoef(data)
if __name__ == '__main__':
    data = readfile('mydat.txt')
    # Treat each column as a variable
    m, s, c = analyze(data.transpose())
```

```
print """
mean=%f
st.dev=%f
correlation matrix:
%s
""" % (m, s, c)
```

The output becomes (typeset with !bc sys):

## 3 Code snippet

Fortran 77 is also sometimes handy (typeset with !bc fcod):

```
subroutine process(a, n, c, r)
C Return array r = c*a
integer n
real*8 a(n), c, r(n)
integer i
do i = 1,n
    r(i) = c*a(i)
end do
return
end
```