20191119—3.2_Basic_Operations—QuTip—fock()____fock_dm()

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0.1 20191119—3.2_Basic_Operations—QuTip—fock()

[1]:
```
from qutip import *
```

[2]:
```
import numpy as np
import matplotlib.pyplot as plt
```

[3]:
```
# we have already know about basis(N,#m) belongs to fock state vector
# please look at last file for more examples on basis()
basis(5,2)
```

[3]:
```
Quantum object: dims = [[5], [1]], shape = (5, 1), type = ket
```

$$\begin{pmatrix} 0.0 \\ 0.0 \\ 1.0 \\ 0.0 \\ 0.0 \end{pmatrix}$$

[4]:
```
# now trying with fock() state vector
fock(5,2)
```

[4]:
```
Quantum object: dims = [[5], [1]], shape = (5, 1), type = ket
```

$$\begin{pmatrix} 0.0 \\ 0.0 \\ 1.0 \\ 0.0 \\ 0.0 \end{pmatrix}$$

[5]:
```
fock(5,3)
```

[5]:
```
Quantum object: dims = [[5], [1]], shape = (5, 1), type = ket
```

$$\begin{pmatrix} 0.0 \\ 0.0 \\ 0.0 \\ 1.0 \\ 0.0 \end{pmatrix}$$

[6]:
```
fock(1)
```

[6]:
```
Quantum object: dims = [[1], [1]], shape = (1, 1), type = bra
```

$$\begin{pmatrix} 1.0 \end{pmatrix}$$

[7]:
```
fock(2)
```

[7]:
```
Quantum object: dims = [[2], [1]], shape = (2, 1), type = ket
```

$$\begin{pmatrix} 1.0 \\ 0.0 \end{pmatrix}$$

[8]:
```
basis(1)
```

[8]:
```
Quantum object: dims = [[1], [1]], shape = (1, 1), type = bra
```

$$\begin{pmatrix} 1.0 \end{pmatrix}$$

[9]:
```
basis(2)
```

[9]:
```
Quantum object: dims = [[2], [1]], shape = (2, 1), type = ket
```

$$\begin{pmatrix} 1.0 \\ 0.0 \end{pmatrix}$$

[10]:
```
fock(6,2)
```

[10]:
```
Quantum object: dims = [[6], [1]], shape = (6, 1), type = ket
```

$$\begin{pmatrix} 0.0 \\ 0.0 \\ 1.0 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix}$$

[11]:
```
basis(6,2)
```

[11]:
```
Quantum object: dims = [[6], [1]], shape = (6, 1), type = ket
```

$$\begin{pmatrix} 0.0 \\ 0.0 \\ 1.0 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix}$$

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- fock(N, n=0, offset=0)
  - Bosonic Fock (number) state.
  - Same as qutip.states.basis.
    - Parameters
      - N [int] Number of states in the Hilbert space.
      - n [int] int for desired number state, defaults to 0 if omitted.
    - Returns
      - Requested number state | .

[12]:
```
fock(4,3)
```

[12]:
```
Quantum object: dims = [[4], [1]], shape = (4, 1), type = ket
```

$$\begin{pmatrix} 0.0 \\ 0.0 \\ 0.0 \\ 1.0 \end{pmatrix}$$

[13]:
```
# fock_dm() - for diagonal purpose only
# same code is not available for basis i.e basis_dm() is not available
fock_dm(3,1)
```

[13]:
```
Quantum object: dims = [[3], [3]], shape = (3, 3), type = oper, isherm = True
```

$$\begin{pmatrix} 0.0 & 0.0 & 0.0 \\ 0.0 & 1.0 & 0.0 \\ 0.0 & 0.0 & 0.0 \end{pmatrix}$$

[14]:
```
fock_dm(2,1)
```

[14]:
```
Quantum object: dims = [[2], [2]], shape = (2, 2), type = oper, isherm = True
```

$$\begin{pmatrix} 0.0 & 0.0 \\ 0.0 & 1.0 \end{pmatrix}$$

[15]:
```
fock_dm(4,1)
```

[15]:
```
Quantum object: dims = [[4], [4]], shape = (4, 4), type = oper, isherm = True
```

$$\begin{pmatrix} 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 1.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 \end{pmatrix}$$

[16]:
```
fock_dm(5,1)
```

[16]:
```
Quantum object: dims = [[5], [5]], shape = (5, 5), type = oper, isherm = True
```

$$\begin{pmatrix} 0.0 & 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 1.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 & 0.0 \end{pmatrix}$$

[17]:
```
fock_dm(2)
```

[17]:
```
Quantum object: dims = [[2], [2]], shape = (2, 2), type = oper, isherm = True
```

$$\begin{pmatrix} 1.0 & 0.0 \\ 0.0 & 0.0 \end{pmatrix}$$

[18]:
```
fock_dm(2,0)
```

[18]:
```
Quantum object: dims = [[2], [2]], shape = (2, 2), type = oper, isherm = True
```

$$\begin{pmatrix} 1.0 & 0.0 \\ 0.0 & 0.0 \end{pmatrix}$$

[19]:
```
fock_dm(3,0)
```

[19]:
```
Quantum object: dims = [[3], [3]], shape = (3, 3), type = oper, isherm = True
```

$$\begin{pmatrix} 1.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 \end{pmatrix}$$

[20]:
```
fock_dm(3,2)
```

[20]:
```
Quantum object: dims = [[3], [3]], shape = (3, 3), type = oper, isherm = True
```

$$\begin{pmatrix} 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 1.0 \end{pmatrix}$$

[21]:
```
fock_dm(4,3)
```

[21]:
```
Quantum object: dims = [[4], [4]], shape = (4, 4), type = oper, isherm = True
```

$$\begin{pmatrix} 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 1.0 \end{pmatrix}$$

[22]:
```
fock_dm(5,4)
```

[22]:
```
Quantum object: dims = [[5], [5]], shape = (5, 5), type = oper, isherm = True
```

$$\begin{pmatrix} 0.0 & 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 & 1.0 \end{pmatrix}$$

[ ]:

[ ]: