

# Package ‘QCSimulator’

August 29, 2016

**Type** Package

**Title** A 5-Qubit Quantum Computing Simulator

**Version** 0.0.1

**Author** Tinniam V Ganesh

**Maintainer** Tinniam V Ganesh<tvganesh.85@gmail.com>

**Description** Simulates a 5 qubit Quantum Computer and evaluates quantum circuits with 1,2 qubit quantum gates.

**LazyData** TRUE

**License** MIT + file LICENSE

**Depends** R (>= 3.1.2)

**Imports** ggplot2

**URL** <https://github.com/tvganesh/QCSimulator>

**RoxygenNote** 5.0.1

**NeedsCompilation** no

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## R topics documented:

CHadamard	3
CNOT2_01	4
CNOT2_10	5
CNOT3_01	6
CNOT3_02	7
CNOT3_10	8
CNOT3_12	9
CNOT3_20	10
CNOT3_21	11
CNOT4_01	12
CNOT4_02	13
CNOT4_03	14

CNOT4_10	15
CNOT4_12	16
CNOT4_13	17
CNOT4_20	18
CNOT4_21	19
CNOT4_23	20
CNOT4_30	21
CNOT4_31	22
CNOT4_32	23
CNOT5_01	24
CNOT5_02	25
CNOT5_03	26
CNOT5_04	27
CNOT5_10	28
CNOT5_12	29
CNOT5_13	30
CNOT5_14	31
CNOT5_20	32
CNOT5_21	33
CNOT5_23	34
CNOT5_24	35
CNOT5_30	36
CNOT5_31	37
CNOT5_32	38
CNOT5_34	39
CNOT5_40	40
CNOT5_41	41
CNOT5_42	42
CNOT5_43	43
CPauliX	44
CPauliY	45
CPauliZ	46
CSWAP	47
DotProduct	48
GateDagger	49
Hadamard	50
init	51
innerProduct	52
measurement	53
PauliX	54
PauliY	55
PauliZ	56
plotMeasurement	57
RotationGate	58
S1Gate	60
SGate	61
SWAPQ0Q1	62
T1Gate	63

<i>CHadamard</i>	3
TensorProd . . . . .	64
TGate . . . . .	65
Toffoli . . . . .	66
ToffoliState . . . . .	67
<b>Index</b>	<b>69</b>

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CHadamard	<i>controlled Hadamard Gate</i>
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---

### Description

This function applies a controlled Hadamard gate om the input

### Usage

CHadamard(q)

### Arguments

q                    The input

### Value

k

### Note

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

### Author(s)

Tinniam V Ganesh

### References

<https://quantumexperience.ng.bluemix.net/>  
<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simula>

### See Also

[CNOT2\\_01](#)  
[PauliX](#)

**Examples**

```
# Initialize global variables
init()
CHadamard(q00_)
CHadamard(I4)
```

---

CNOT2_01	<i>2 qubit CNOT gate (control-0,target-1)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 2 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 0 and target is qubit 1

**Usage**

```
CNOT2_01(a)
```

**Arguments**

a	The input
---	-----------

**Value**

result The result of applying the CNOT2\_01 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT2_01(q11_)
CNOT2_01(I4)
```

---

CNOT2_10	<i>2 qubit CNOT gate (control-1,target-0)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 2 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 1 and target is qubit 0

**Usage**

```
CNOT2_10(a)
```

**Arguments**

a	The input
---	-----------

**Value**

result The result of applying the CNOT2\_10 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT2_10(q10_)
CNOT2_10(I4)
```

---

CNOT3_01	<i>3 qubit CNOT gate (control-0,target-1)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 3 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 0 and target is qubit 1

**Usage**

```
CNOT3_01(a)
```

**Arguments**

a	The input
---	-----------

**Value**

result The result of applying the CNOT3\_01 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT3_01(q101_)
CNOT3_01(I8)
```

---

CNOT3_02	<i>3 qubit CNOT gate (control-0,target-2)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 3 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 0 and target is qubit 2

**Usage**

```
CNOT3_02(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT3\_02 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT3_02(q111_)
CNOT3_02(I8)
```

---

CNOT3_10	<i>3 qubit CNOT gate (control-1,target-0)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 3 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 1 and target is qubit 0

**Usage**

```
CNOT3_10(a)
```

**Arguments**

a	The input
---	-----------

**Value**

result The result of applying the CNOT3\_10 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT3\\_12](#)



**Examples**

```
# Initialize global variables
init()
CNOT3_10(q101_)
CNOT3_10(I8)
```

---

CNOT3_12	<i>3 qubit CNOT gate (control-1,target-2)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 3 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 1 and target is qubit 2

**Usage**

```
CNOT3_12(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT3\_12 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT3_12(q101_)
CNOT3_12(I8)
```

---

CNOT3_20	<i>3 qubit CNOT gate (control-2,target-0)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 3 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 2 and target is qubit 0

**Usage**

```
CNOT3_20(a)
```

**Arguments**

a	The input
---	-----------

**Value**

result The result of applying the CNOT3\_20 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT3_20(q101_)
CNOT3_20(I8)
```

---

CNOT3_21	<i>3 qubit CNOT gate (control-2,target-1)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 3 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 2 and target is qubit 1

**Usage**

```
CNOT3_21(a)
```

**Arguments**

a	The input
---	-----------

**Value**

result The result of applying the CNOT3\_12 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT3_21(I8)
CNOT3_21(q101_)
```

---

CNOT4_01	<i>4 qubit CNOT gate (control-0,target-1)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 4 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 0 and target is qubit 1

**Usage**

```
CNOT4_01(a)
```

**Arguments**

a	The input
---	-----------

**Value**

result The result of applying the CNOT4\_01 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT4_01(q1001_)
CNOT4_01(I16)
```

---

CNOT4_02	<i>4 qubit CNOT gate (control-0,target-2)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 4 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 0 and target is qubit 2

**Usage**

```
CNOT4_02(a)
```

**Arguments**

a	The input
---	-----------

**Value**

result The result of applying the CNOT4\_02 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT4_02(q1001_)
CNOT4_02(I16)
```

---

CNOT4_03	<i>4 qubit CNOT gate (control-0,target-3)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 4 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 0 and target is qubit 3

**Usage**

```
CNOT4_03(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT4\_03 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT4_03(q1001_)
CNOT4_03(I16)
```

---

CNOT4_10	<i>4 qubit CNOT gate (control-1,target-0)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 4 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 1 and target is qubit 0

**Usage**

```
CNOT4_10(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT4\_10 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT4_10(q1001_)
CNOT4_10(I16)
```

---

CNOT4_12	<i>4 qubit CNOT gate (control-1,target-2)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 4 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 1 and target is qubit 2

**Usage**

```
CNOT4_12(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT4\_12 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)



**Examples**

```
# Initialize global variables
init()
CNOT4_12(q1001_)
CNOT4_12(I16)
```

---

CNOT4_13	<i>4 qubit CNOT gate (control-1,target-3)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 4 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 1 and target is qubit 3

**Usage**

```
CNOT4_13(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT4\_13 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT4_13(q1001_)
CNOT4_13(I16)
```

---

CNOT4_20	<i>4 qubit CNOT gate (control-2,target-0)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 4 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 2 and target is qubit 0

**Usage**

```
CNOT4_20(a)
```

**Arguments**

a	The input
---	-----------

**Value**

result The result of applying the CNOT4\_20 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT4_20(q1001_)
CNOT4_13(I16)
```

---

CNOT4_21	<i>4 qubit CNOT gate (control-2,target-1)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 4 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 2 and target is qubit 1

**Usage**

```
CNOT4_21(a)
```

**Arguments**

a                   The input

**Value**

result The result of applying the CNOT4\_21 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT4_21(q1001_)
CNOT4_21(I16)
```

---

CNOT4_23	<i>4 qubit CNOT gate (control-2,target-3)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 4 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 2 and target is qubit 3

**Usage**

```
CNOT4_23(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT4\_23 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT4_23(q1001_)
CNOT4_23(I16)
```

---

CNOT4_30	<i>4 qubit CNOT gate (control-3,target-0)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 4 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 3 and target is qubit 0

**Usage**

```
CNOT4_30(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT4\_23 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT4_30(q1001_)
CNOT4_30(I16)
```

---

CNOT4_31	<i>4 qubit CNOT gate (control-3,target-1)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 4 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 3 and target is qubit 1

**Usage**

```
CNOT4_31(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT4\_31 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT4_31(q1001_)
CNOT4_31(I16)
```

---

CNOT4_32	<i>4 qubit CNOT gate (control-3,target-2)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 4 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 3 and target is qubit 2

**Usage**

```
CNOT4_32(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT4\_32 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT4_32(q1001_)
CNOT4_32(I16)
```

---

CNOT5_01	<i>5 qubit CNOT gate (control-0,target-1)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 0 and target is qubit 1

**Usage**

```
CNOT5_01(a)
```

**Arguments**

a	The input
---	-----------

**Value**

result The result of applying the CNOT5\_01 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT3\\_12](#)



**Examples**

```
# Initialize global variables
init()
CNOT5_01(q10010_)
CNOT5_01(I32)
```

---

CNOT5_02	<i>5 qubit CNOT gate (control-0,target-2)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 0 and target is qubit 2

**Usage**

```
CNOT5_02(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT5\_02 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_02(q10010_)
CNOT5_02(I32)
```

---

CNOT5_03	<i>5 qubit CNOT gate (control-0,target-3)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 0 and target is qubit 3

**Usage**

```
CNOT5_03(a)
```

**Arguments**

a	The input
---	-----------

**Value**

result The result of applying the CNOT5\_03 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_03(q10010_)
CNOT5_03(I32)
```

---

CNOT5_04	<i>5 qubit CNOT gate (control-0,target-4)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 0 and target is qubit 3

**Usage**

```
CNOT5_04(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT5\_04 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_04(q10010_)
CNOT5_04(I32)
```

---

CNOT5_10	<i>5 qubit CNOT gate (control-1,target-0)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 1 and target is qubit 0

**Usage**

```
CNOT5_10(a)
```

**Arguments**

a	The input
---	-----------

**Value**

result The result of applying the CNOT5\_10 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_10(q10010_)
CNOT5_10(I32)
```

---

CNOT5_12	<i>5 qubit CNOT gate (control-1,target-2)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 1 and target is qubit 2

**Usage**

```
CNOT5_12(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT5\_12 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_12(q10010_)
CNOT5_12(I32)
```

---

CNOT5_13	<i>5 qubit CNOT gate (control-1,target-3)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 1 and target is qubit 3

**Usage**

```
CNOT5_13(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT5\_13 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_13(q10010_)
CNOT5_13(I32)
```

---

CNOT5_14	<i>5 qubit CNOT gate (control-1,target-4)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 1 and target is qubit 4

**Usage**

```
CNOT5_14(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT5\_14 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_14(q10010_)
CNOT5_14(I32)
```

---

CNOT5_20	<i>5 qubit CNOT gate (control-2,target-0)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 2 and target is qubit 0

**Usage**

```
CNOT5_20(a)
```

**Arguments**

a	The input
---	-----------

**Value**

result The result of applying the CNOT5\_20 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT4\\_13](#)



**Examples**

```
# Initialize global variables
init()
CNOT5_20(q10010_)
CNOT5_20(I32)
```

---

CNOT5_21	<i>5 qubit CNOT gate (control-2,target-1)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 2 and target is qubit 1

**Usage**

```
CNOT5_21(a)
```

**Arguments**

a	The input
---	-----------

**Value**

result The result of applying the CNOT5\_21 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT5\\_13](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_21(q10010_)
CNOT5_21(I32)
```

---

CNOT5_23	<i>5 qubit CNOT gate (control-2,target-3)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 2 and target is qubit 3

**Usage**

```
CNOT5_23(a)
```

**Arguments**

a                   The input

**Value**

result The result of applying the CNOT5\_23 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT5\\_13](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_23(q10010_)
CNOT5_23(I32)
```

---

CNOT5_24	<i>5 qubit CNOT gate (control-2,target-4)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 2 and target is qubit 4

**Usage**

```
CNOT5_24(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT5\_24 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT5\\_13](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_24(q10010_)
CNOT5_24(I32)
```

---

CNOT5_30	<i>5 qubit CNOT gate (control-3,target-0)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 3 and target is qubit 0

**Usage**

```
CNOT5_30(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT5\_30 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT5\\_13](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_30(q10010_)
CNOT5_30(I32)
```

---

CNOT5_31	<i>5 qubit CNOT gate (control-3,target-1)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 3 and target is qubit 1

**Usage**

```
CNOT5_31(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT5\_31 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT5\\_13](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_31(q10010_)
CNOT5_31(I32)
```

---

CNOT5_32	<i>5 qubit CNOT gate (control-3,target-2)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 3 and target is qubit 2

**Usage**

```
CNOT5_32(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT5\_32 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT5\\_13](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_32(q10010_)
CNOT5_32(I32)
```

---

CNOT5_34	<i>5 qubit CNOT gate (control-3,target-4)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 3 and target is qubit 4

**Usage**

```
CNOT5_34(a)
```

**Arguments**

a                   The input

**Value**

result The result of applying the CNOT5\_34 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT5\\_13](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_34(q10010_)
CNOT5_34(I32)
```

---

CNOT5_40	<i>5 qubit CNOT gate (control-4,target-0)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 4 and target is qubit 0

**Usage**

```
CNOT5_40(a)
```

**Arguments**

a	The input
---	-----------

**Value**

result The result of applying the CNOT5\_40 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT5\\_13](#)



**Examples**

```
# Initialize global variables
init()
CNOT5_40(q10010_)
CNOT5_40(I32)
```

---

CNOT5_41	<i>5 qubit CNOT gate (control-4,target-1)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 4 and target is qubit 1

**Usage**

```
CNOT5_41(a)
```

**Arguments**

a                   The input

**Value**

result The result of applying the CNOT5\_41 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT5\\_13](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_41(q10010_)
CNOT5_41(I32)
```

---

CNOT5_42	<i>5 qubit CNOT gate (control-4,target-2)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 4 and target is qubit 2

**Usage**

```
CNOT5_42(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT5\_42 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT5\\_13](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_42(q10010_)
CNOT5_42(I32)
```

---

CNOT5_43	<i>5 qubit CNOT gate (control-4,target-3)</i>
----------	---

---

**Description**

This function applies a CNOT gate to 5 qubits. The qubits start from 0,1,2,3,4. Here control is qubit 4 and target is qubit 3

**Usage**

```
CNOT5_43(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CNOT5\_43 gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables
init()
CNOT5_43(q10010_)
CNOT5_43(I32)
```

---

CPauliX

*Controlled Pauli X gate*

---

**Description**

This function applies a controlled Pauli X gate on its input

**Usage**

```
CPauliX(q)
```

**Arguments**

q                    The input

**Value**

2 The result of applying the CPauliX gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT5\\_13](#)

**Examples**

```
# Initialize global variables
init()
CPauliX(q11_)
CPauliX(I4)
```

---

CPauliY	<i>Controlled Pauli Y gate</i>
---------	--------------------------------

---

**Description**

This function applies a controlled Pauli Y gate on its input

**Usage**

```
CPauliY(q)
```

**Arguments**

q                    The input

**Value**

2 The result of applying the CPauliY gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables
init()
CPauliY(q11_)
CPauliY(I4)
```

---

CPauliZ	<i>Controlled Pauli Z gate</i>
---------	--------------------------------

---

**Description**

This function applies a controlled Pauli Z gate on its input

**Usage**

```
CPauliZ(q)
```

**Arguments**

q                    The input

**Value**

2 The result of applying the CPauliZ gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables
init()
CPauliZ(q11_)
CPauliZ(I4)
```

---

CSWAP

*Controlled SWAP gate*

---

**Description**

This function applies a controlled swap of qubits gate on its input

**Usage**

```
CSWAP(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the CSWAP gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables
init()
CSWAP(q11_)
CSWAP(I4)
```

---

DotProduct	<i>Dot product of 2 vectors</i>
------------	---------------------------------

---

**Description**

This function performs a dot product of 2 vectors

**Usage**

```
DotProduct(a,b)
```

**Arguments**

a	Vector 1
b	Vector 2

**Value**

result The result of dot product

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>



**See Also**

CNOT2\_10  
PauliX  
measurement  
plotMeasurement  
CNOT5\_03  
CNOT4\_13

**Examples**

```
# Initialize global variables
init()
DotProduct(Hadamard(I2),q1_)
DotProduct(CNOT2_01(I4),q01_)
```

---

GateDagger

*Gate dagger of a vector*

---

**Description**

This function performs a gate dagger transformation. It performs the transpose of the complex conjugate of the unitary matrix

**Usage**

```
GateDagger(a)
```

**Arguments**

a                    Matrix a

**Value**

gateDagger The result of performing gate dagger function

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables
init()
GateDagger(TGate(I2))
```

---

Hadamard

*Hadamard gate*

---

**Description**

This function applies a Hadamard gate on its input

**Usage**

```
Hadamard(a)
```

**Arguments**

a                    The input

**Value**

2 The result of applying the Hadamard gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qcsimulator-a-5-qubit-quantum-computing-simula>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables
init()
Hadamard(Hadamard(I2))
Hadamard(I2)
```

---

init

*Initialization*

---

**Description**

This function performs an initialization and sets variables in the global environment

**Usage**

```
init()
```

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qcsimulator-a-5-qubit-quantum-computing-simula>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT5\\_13](#)

**Examples**

```
# Initialize global variables
init()
# Display variables
ls()
q001_
I16
```

---

innerProduct

*Inner product of 2 vectors and computes the angle between vectors*

---

**Description**

This function performs a inner product of 2 vectors and outputs the angle between vectors

**Usage**

```
innerProduct(a,b)
```

**Arguments**

a	Vector 1
b	Vector 2

**Value**

theta The angle between the vectors

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

## References

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

## See Also

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT5\\_13](#)

## Examples

```
# Initialize global variables
init()
phi = matrix(c(1/2,sqrt(3)/2),nrow=2,ncol=1)
si = matrix(c(1/sqrt(2),1/sqrt(2)),nrow=2,ncol=1)
innerProduct(phi,si)
```

---

measurement

*Computes the square of the modulus*

---

## Description

This function computes the square of the amplitude of the vectors

## Usage

```
measurement(a)
```

## Arguments

a                    The vector

## Value

x The square of the modulus of the vector

## Note

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>  
<https://gigadom.wordpress.com/2016/06/23/introducing-qcsimulator-a-5-qubit-quantum-computing-simul>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT5\\_13](#)

**Examples**

```
# Initialize global variables
init()
measurement(TGate(PauliX(I2)))
```

---

PauliX

*Controlled Pauli X gate*

---

**Description**

This function applies a Pauli X gate on its input

**Usage**

```
PauliX(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the PauliX gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**<https://quantumexperience.ng.bluemix.net/><https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>**See Also**[CNOT2\\_10](#)[PauliX](#)[measurement](#)[plotMeasurement](#)[CNOT5\\_03](#)[CNOT4\\_13](#)**Examples**

```
# Initialize global variables
init()
PauliX(q1_)
Hadamard(PauliX(I2))
```

---

**PauliY***Controlled Pauli Y gate*

---

**Description**

This function applies a Pauli Y gate on its input

**Usage**

PauliY(a)

**Arguments**

a                    The input

**Value**

result The result of applying the PauliY gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables
init()
PauliY(q1_)
Hadamard(PauliY(I2))
```

---

PauliZ

*Controlled Pauli Z gate*

---

**Description**

This function applies a Pauli Z gate on its input

**Usage**

```
PauliZ(a)
```

**Arguments**

a                    The input



**Value**

result The result of applying the PauliZ gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables
init()
PauliZ(q1_)
Hadamard(PauliZ(I2))
```

---

plotMeasurement

*This function plots the result of a measurement*

---

**Description**

This function plots the output of a quantum circuit

**Usage**

```
plotMeasurement(a)
```

**Arguments**

a                    The vector

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables
init()
plotMeasurement(measurement(TensorProd(Hadamard(I2),Hadamard(I2))))
```

---

RotationGate

*This function applies the rotation gate*

---

**Description**

This function applies the rotation gate on its input through an angle `t`

**Usage**

```
RotationGate(t,a)
```

**Arguments**

t	The angle to rotate
a	The vector

**Value**

result The result of applying the Rotation gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>  
<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables  
init()  
RotationGate(30,q0_)
```

---

S1Gate

*Controlled S1Gate*

---

### Description

This function applies a S1Gate on its input

### Usage

S1Gate(a)

### Arguments

a                    The input

### Value

result The result of applying the S1Gate

### Note

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

### Author(s)

Tinniam V Ganesh

### References

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qcsimulator-a-5-qubit-quantum-computing-simula>

### See Also

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables
init()
S1Gate(q1_)
S1Gate(PauliX(I2))
```

---

SGate	<i>Apply a SGate</i>
-------	----------------------

---

**Description**

This function applies a SGate on its input

**Usage**

```
SGate(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the SGate gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables
init()
SGate(q1_)
SGate(Hadamard(I2))
```

---

SWAPQ0Q1

*SWAP Q0 Q1*

---

**Description**

This function swaps q0 and q1

**Usage**

SWAPQ0Q1 (q)

**Arguments**

q                    The input

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qcsimulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables
init()
SWAPQ0Q1(q110_)
SWAPQ0Q1(q010_)
```

---

T1Gate	<i>Apply a T1Gate</i>
--------	-----------------------

---

**Description**

This function applies a T1Gate on its input

**Usage**

```
T1Gate(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the T1Gate gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT3\\_12](#)

**Examples**

```
# Initialize global variables
init()
T1Gate(q1_)
T1Gate(SGate(Hadamard(I2)))
```

---

TensorProd	<i>Tensor product of 2 vectors</i>
------------	------------------------------------

---

**Description**

This function performs a tensor product of 2 vectors

**Usage**

```
TensorProd(a,b)
```

**Arguments**

a	Vector 1
b	Vector 2

**Value**

result The tensor product of the vectors

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>  
<https://gigadom.wordpress.com/2016/06/23/introducing-qcsimulator-a-5-qubit-quantum-computing-simula>



**See Also**

[CNOT2\\_10](#)  
[PauliX](#)  
[measurement](#)  
[plotMeasurement](#)  
[CNOT5\\_03](#)  
[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables
init()
TensorProd(Hadamard(I2),Hadamard(I2))
```

---

TGate

*Apply a TGate*

---

**Description**

This function applies a TGate on its input

**Usage**

```
TGate(a)
```

**Arguments**

a                    The input

**Value**

result The result of applying the TGate gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>  
<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

CNOT2\_10  
PauliX  
measurement  
plotMeasurement  
CNOT5\_03  
CNOT4\_13

**Examples**

```
# Initialize global variables
init()
TGate(q1_)
TGate(S1Gate(Hadamard(I2)))
```

---

Toffoli

*Apply a Toffoli gate*

---

**Description**

This function applies a Toffoli on its input

**Usage**

```
Toffoli(q)
```

**Arguments**

q                    The input

**Value**

c The result of applying the TGate gate

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables
init()
Toffoli(q100_)
Toffoli(q101_)
```

---

ToffoliState

*Apply a Toffoli state*

---

**Description**

This function applies a Toffoli state on its input

**Usage**

```
ToffoliState(a)
```

**Arguments**

a                    The input

**Note**

Maintainer: Tinniam V Ganesh <tvganesh.85@gmail.com>

**Author(s)**

Tinniam V Ganesh

**References**

<https://quantumexperience.ng.bluemix.net/>

<https://gigadom.wordpress.com/2016/06/23/introducing-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**See Also**

[CNOT2\\_10](#)

[PauliX](#)

[measurement](#)

[plotMeasurement](#)

[CNOT5\\_03](#)

[CNOT4\\_13](#)

**Examples**

```
# Initialize global variables
init()
ToffoliState(q100_)
```

# Index

CHadamard, 3  
CNOT2\_01, 3, 4  
CNOT2\_10, 4, 5, 5, 6–47, 49–63, 65–68  
CNOT3\_01, 6  
CNOT3\_02, 7  
CNOT3\_10, 8  
CNOT3\_12, 4–9, 9, 10–30, 63  
CNOT3\_20, 10  
CNOT3\_21, 11  
CNOT4\_01, 12  
CNOT4\_02, 13  
CNOT4\_03, 14  
CNOT4\_10, 15  
CNOT4\_12, 16  
CNOT4\_13, 17, 31, 32, 43, 45–47, 49–51, 55–62, 65–68  
CNOT4\_20, 18  
CNOT4\_21, 19  
CNOT4\_23, 20  
CNOT4\_30, 21  
CNOT4\_31, 22  
CNOT4\_32, 23  
CNOT5\_01, 24  
CNOT5\_02, 25  
CNOT5\_03, 4–26, 26, 27–47, 49–63, 65–68  
CNOT5\_04, 27  
CNOT5\_10, 28  
CNOT5\_12, 29  
CNOT5\_13, 30, 33–42, 44, 52–54  
CNOT5\_14, 31  
CNOT5\_20, 32  
CNOT5\_21, 33  
CNOT5\_23, 34  
CNOT5\_24, 35  
CNOT5\_30, 36  
CNOT5\_31, 37  
CNOT5\_32, 38  
CNOT5\_34, 39  
CNOT5\_40, 40  
CNOT5\_41, 41  
CNOT5\_42, 42  
CNOT5\_43, 43  
CPauliX, 44  
CPauliY, 45  
CPauliZ, 46  
CSWAP, 47  
DotProduct, 48  
GateDagger, 49  
Hadamard, 50  
init, 51  
innerProduct, 52  
measurement, 4–47, 49–53, 53, 54–63, 65–68  
PauliX, 3–47, 49–54, 54, 55–63, 65–68  
PauliY, 55  
PauliZ, 56  
plotMeasurement, 4–47, 49–57, 57, 58–63, 65–68  
RotationGate, 58  
S1Gate, 60  
SGate, 61  
SWAPQ0Q1, 62  
T1Gate, 63  
TensorProd, 64  
TGate, 65  
Toffoli, 66  
ToffoliState, 67