

# Package ‘QCSimulator’

May 7, 2026

**Type** Package

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

**Version** 0.0.1

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**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

**Repository** CRAN

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---

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

---

**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-simulator/>

**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-simulator/>

**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-qcsimulator-a-5-qubit-quantum-computing-simula>**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-qcsimulator-a-5-qubit-quantum-computing-simula>

**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-simulator/>

### 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-qc-simulator-a-5-qubit-quantum-computing-simulator/>

**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-qcsimulator-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_)
```

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