

GetPauliStringFromIndex

```
SetDirectory @ NotebookDirectory[];  
Import["../Link/QuESTlink.m"];
```

Doc

? GetPauliStringFromIndex

Symbol

GetPauliStringFromIndex[n, m] returns the n-th ordered m-Pauli string,
where the zero-th qubit (or subscripted index) is treated as the least significant.

GetPauliStringFromIndex[n] returns the n-th ordered
m-Pauli string, where m is inferred as the minimum to support index n.

GetPauliStringFromIndex accepts optional argument "Removelds"
-> False (default True) which retains otherwise removed Id operators,
so that the returned string has an explicit Pauli operator on every qubit.

Correctness

```
GetPauliStringFromIndex[41 - 1]  
GetPauliStringFromIndex[42 - 1]  
GetPauliStringFromIndex[43 - 1]
```

Z_0

$Z_0 Z_1$

$Z_0 Z_1 Z_2$

```
GetPauliStringFromIndex[0]  
GetPauliStringFromIndex[0, 2]  
GetPauliStringFromIndex[0, 3]
```

Id_0

Id_1

Id_2

```
GetPauliStringFromIndex[5]
```

$X_0 X_1$

```

And @@ Table[
  PauliMatrix[n] ==
    Normal @
      CalcPauliExpressionMatrix @
        GetPauliStringFromIndex[n],
    {n, 0, 3}]
True

```

Optional “removeIds”

```

GetPauliStringFromIndex[4, "RemoveIds" → False]
Id0 X1

GetPauliStringFromIndex[0, 5, "RemoveIds" → False]
Id0 Id1 Id2 Id3 Id4

GetPauliStringFromIndex[56 921, 10, "RemoveIds" → False]
Id8 Id9 X0 X2 X3 X6 Y1 Y4 Z5 Z7

GetPauliStringFromIndex[0, "RemoveIds" → True]
Id0

GetPauliStringFromIndex[0, 5, "RemoveIds" → True]
Id4

GetPauliStringFromIndex[1, "RemoveIds" → True]
X0

```

Errors

```

GetPauliStringFromIndex[-1]
... GetPauliStringFromIndex: Index must be positive or zero.
$Failed

GetPauliStringFromIndex[-1, 3]
... GetPauliStringFromIndex: Index must be positive or zero.
$Failed

GetPauliStringFromIndex[1, 0]
... GetPauliStringFromIndex: The number of Paulis must be positive.
$Failed

```

GetPauliStringFromIndex[91, 2]

... **GetPauliStringFromIndex**: The given index (91) exceeds the maximum possible ($15 = 4^{2-1}$) for the given number of Pauli operators (2).

\$Failed

GetPauliStringFromIndex[91, 2, 3]

... **GetPauliStringFromIndex**: Invalid arguments. See ?GetPauliStringFromIndex

\$Failed

GetPauliStringFromIndex[3, 1, "BadOption" → True]

... **OptionValue**: Unknown option BadOption for GetPauliStringFromIndex.

\$Failed

GetPauliStringFromIndex[3, 1, "RemoveIds" → "bad value"]

... **GetPauliStringFromIndex**: Option "RemoveIds" must be True or False.

\$Failed