DrawPauliStringAsTree

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

Doc

```
? DrawPauliStringAsTree
```

Symbol

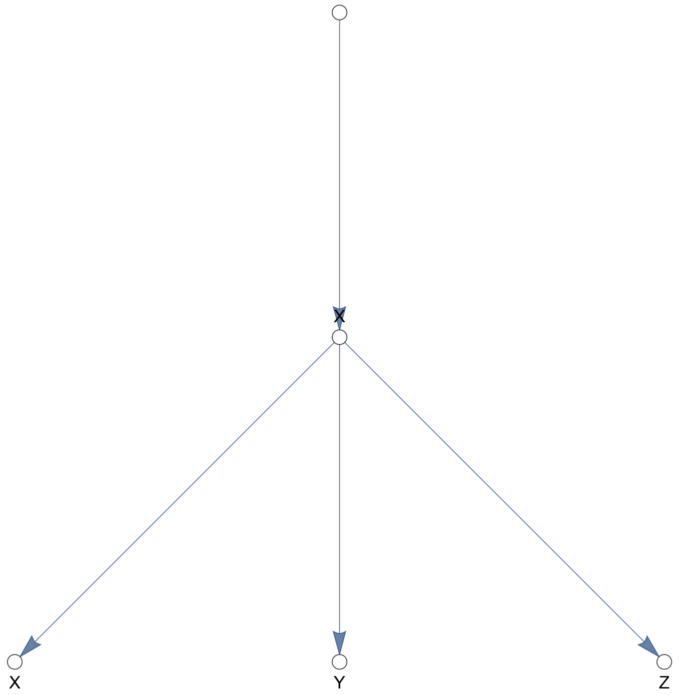
DrawPauliStringAsTree [paulis] draws the given sum of Pauli strings as a tree, where Pauli products with the same prefix operators share ancestors. This visualises a compressed form of the ensemble without coefficients.

DrawPauliStringAsTree also accepts option "SmallestIsRoot" −>True to reverse the ordering of the strings such that increasing tree depth corresponds to increasing qubit index.

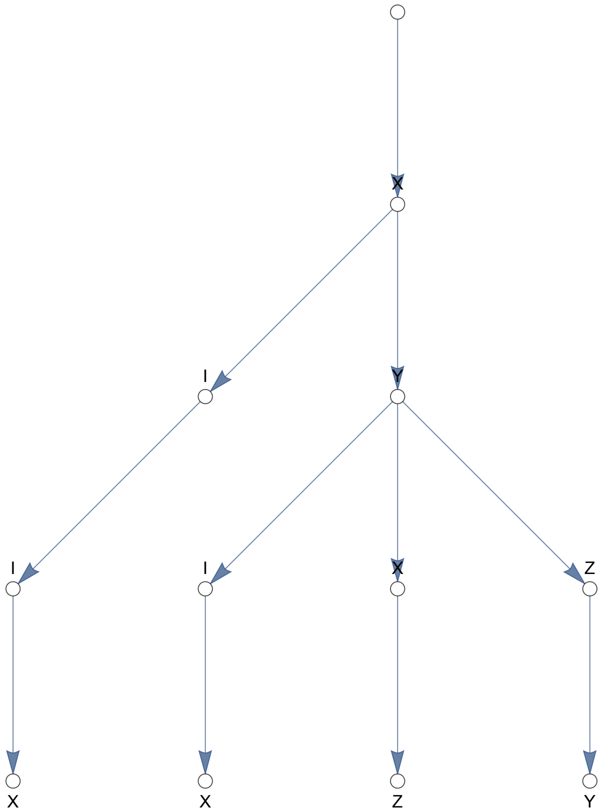
Correctness

Pauli strings

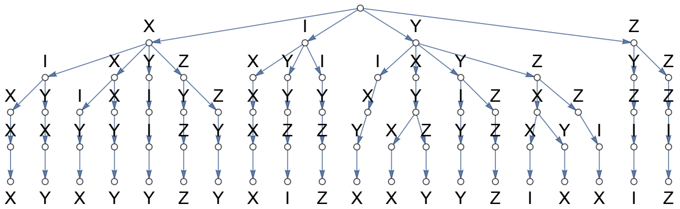
DrawPauliStringAsTree[$X_1\,X_0 + X_1\,Y_0 + X_1\,Z_0$]



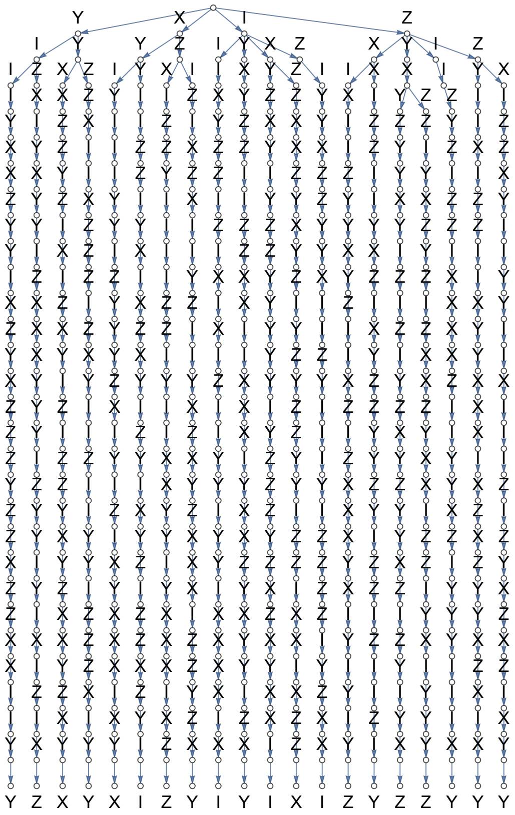
DrawPauliStringAsTree @ SimplifyPaulis[$Y_2 X_3 (X_0 + Y_0 Z_1 + X_1 Z_0) + X_3 X_0$**]**



DrawPauliStringAsTree @ GetRandomPauliString[5, 20]

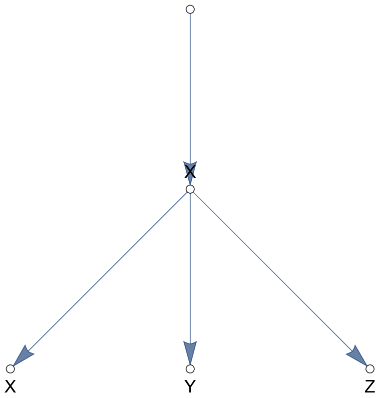

X I Y Z
I X Y Z X Y I I X Y Z Y Z
X Y I X I Y Z X Y Y X Y I Z X Z Z Z
X X Y Y I Z Y X Z Z Y X Z Y Z X Y I I I
X Y X Y Y Z Y X I Z X X Y Y Z I X X I Z

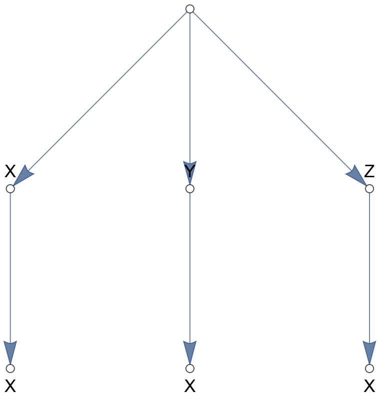
```
DrawPauliStringAsTree @ GetRandomPauliString[30, 20]
```


Y X I Z
Y Z X Z I Y X I I Y X Z I I X Y Z X Y Z Z I Z X Y I I X I Y Z I Z Y X
Y Z X Y X I Z Y I Y I X I Z Y Z Z Y Y Y

“SmallestIsRoot” -> True

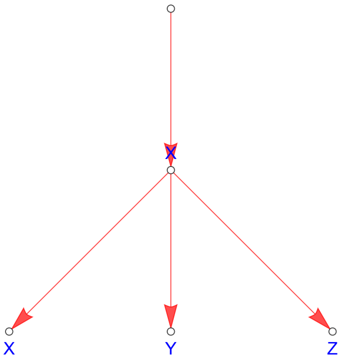
```
DrawPauliStringAsTree[X_1 X_0 + X_1 Y_0 + X_1 Z_0, "SmallestIsRoot" → False]
DrawPauliStringAsTree[X_1 X_0 + X_1 Y_0 + X_1 Z_0, "SmallestIsRoot" → True]
```



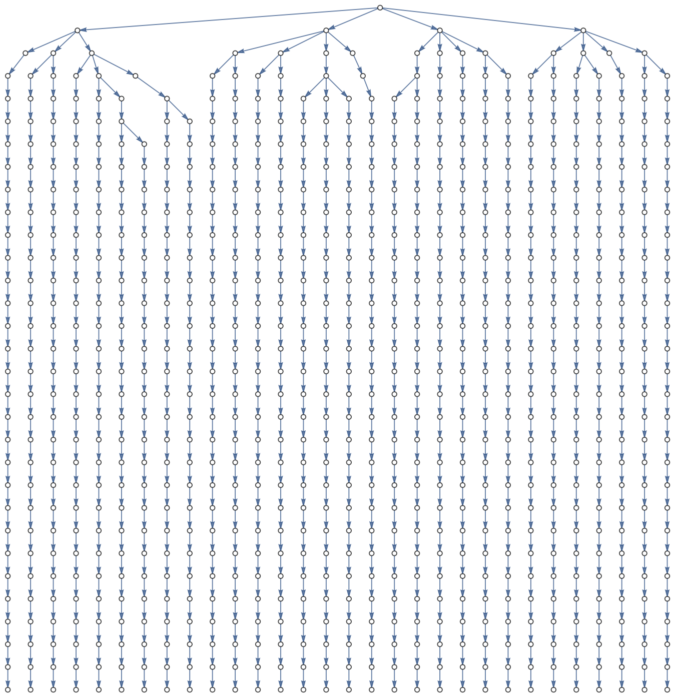


Graph options

```
DrawPauliStringAsTree[
      X_1 X_0 + X_1 Y_0 + X_1 Z_0,
      EdgeStyle → Red,
      VertexLabelStyle → Blue
]
```



```
DrawPauliStringAsTree[
      GetRandomPauliString[30, 30],
      VertexLabels → None
]
```



Errors

```
DrawPauliStringAsTree[]
```

```
DrawPauliStringAsTree : Invalid arguments. See ?DrawPauliStringAsTree
```

```
$Failed
```

DrawPauliStringAsTree[X_0 - 1]

```
DrawPauliStringAsTree : Invalid arguments. See ?DrawPauliStringAsTree
```

```
$Failed
```

```
(* still permit drawing on bad option *)
```

DrawPauliStringAsTree[$X_1 X_0 + X_1 Z_0$, badopt → True]

```
OptionValue : Unknown option badopt for {DrawPauliStringAsTree , Graph }.
```