Output

```
Player X turn
- - -
- - -
- - -
Enter row and column numbers to fix spot: 1 1

Player O turn
X - -
- - -
- - -
Enter row and column numbers to fix spot: 2 1

Player X turn
X - -
O - -
- - -
Enter row and column numbers to fix spot: 1 2

Player O turn
X X -
O - -
- - -
Enter row and column numbers to fix spot: 2 3

Player X turn
X X -
O - O
- - -
Enter row and column numbers to fix spot: 1 3

Player X wins the game!

X X X
O - O
- - -
```

Output

```
4 1 2
5 8 3
7 6 0

4 1 2
5 8 3
7 0 6

4 1 2
5 0 3
7 8 6

4 1 2
0 5 3
7 8 6

0 1 2
4 5 3
7 8 6

1 0 2
4 5 3
7 8 6

1 2 0
4 5 3
7 8 6

1 2 3
4 5 0
7 8 6

1 2 3
4 5 6
7 8 0

Solved with Manhattan distance exploring 12 states
Solved with Manhattan least squares exploring 40 states
Solved with linear distance exploring 18 states
Solved with linear least squares exploring 56 states
```

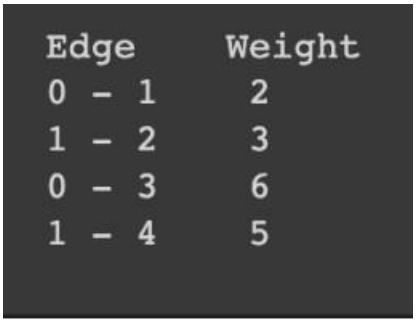
Output

```
[1, 0, 0, 0, 0, 0, 0, 0]
[0, 0, 0, 0, 0, 0, 1, 0]
[0, 0, 0, 0, 1, 0, 0, 0]
[0, 0, 0, 0, 0, 0, 0, 1]
[0, 1, 0, 0, 0, 0, 0, 0]
[0, 0, 0, 1, 0, 0, 0, 0]
[0, 0, 0, 0, 0, 1, 0, 0]
[0, 0, 1, 0, 0, 0, 0, 0]
```

Output

```
Topological Sort:
[5, 4, 2, 3, 1, 0]
```

Output



Output

```
0 1 3 2 8 9
```

Output

```
The 8 puzzle is solvable

  2 8 3
  1 6 4
  7 0 5

  2 8 3
  1 0 4
  7 6 5

  2 0 3
  1 8 4
  7 6 5

  0 2 3
  1 8 4
  7 6 5

  1 2 3
  0 8 4
  7 6 5

  1 2 3
  8 0 4
  7 6 5

Steps to reach goal: 5
Total nodes visited:  6
```

Output

```
The optimal value is : 12
```

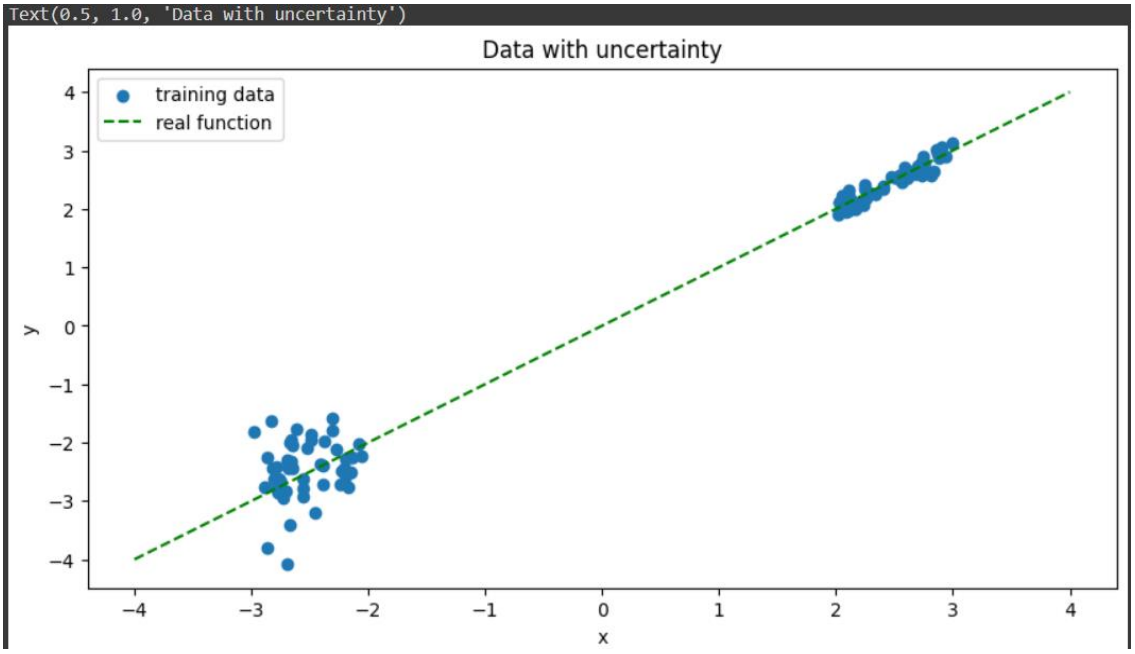
Output

```
Unification successfully!
['b(A)/Z', 'f(Y)/X', 'g(Z)/Y']
```

Output

```
{'P': True}
{'Q': True, 'P': True}
{'R': True, 'P': True}
{'R': True, 'Q': True, 'P': True}
{'R': False, 'P': True}
{'R': False, 'Q': True, 'P': True}
```

Output


Text(0.5, 1.0, 'Data with uncertainty')
Data with uncertainty
training data
real function
y
x
4
3
2
1
0
−1
−2
−3
−4
−4
−3
−2
−1
0
1
2
3
4

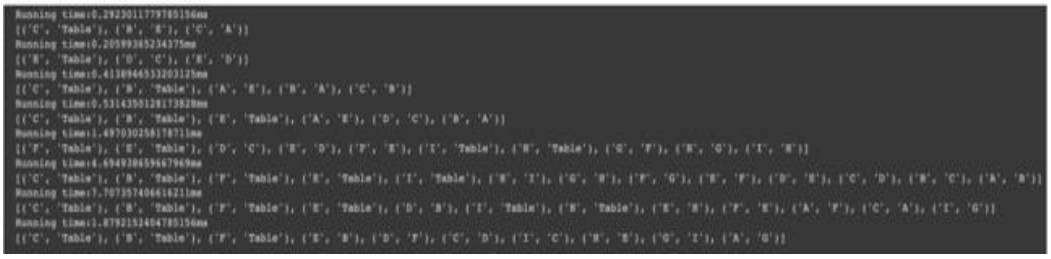
Output


Running time:0.2923011779785156ms
[('C', 'Table'), ('B', 'E'), ('C', 'A')]
Running time:0.2059936523437Sms
[('E', 'Table'), ('D', 'C'), ('E', 'D')]
Running time:0.4138946533203125ms
[('C', 'Table'), ('B', 'Table'), ('A', 'E'), ('E', 'A'), ('C', 'E')]
Running time:0.5314350128173828ms
[('C', 'Table'), ('B', 'Table'), ('E', 'Table'), ('A', 'E'), ('D', 'C'), ('B', 'A')]
Running time:1.4970302581787Ims
[('F', 'Table'), ('E', 'Table'), ('D', 'C'), ('E', 'D'), ('F', 'E'), ('I', 'Table'), ('H', 'Table'), ('G', 'F'), ('E', 'G'), ('I', 'H')]
Running time:4.694938659667969ms
[('C', 'Table'), ('B', 'Table'), ('F', 'Table'), ('E', 'Table'), ('I', 'Table'), ('E', 'I'), ('G', 'H'), ('F', 'G'), ('E', 'F'), ('D', 'E'), ('C', 'D'), ('B', 'C'), ('A', 'B')]
Running time:7.707357406616211ms
[('C', 'Table'), ('B', 'Table'), ('F', 'Table'), ('E', 'Table'), ('D', 'B'), ('I', 'Table'), ('H', 'Table'), ('E', 'H'), ('F', 'E'), ('A', 'F'), ('C', 'A'), ('I', 'G')]
Running time:1.8792152404785156ms
[('C', 'Table'), ('B', 'Table'), ('F', 'Table'), ('E', 'B'), ('D', 'F'), ('C', 'D'), ('I', 'C'), ('H', 'E'), ('G', 'I'), ('A', 'G')]

Output

```
Accuracy: 1.0
```

Output


Running time:0.2923011779785156ms
[('C', 'Table'), ('B', 'E'), ('C', 'A')]
Running time:0.2059936523437ms
[('B', 'Table'), ('D', 'C'), ('E', 'D')]
Running time:0.4138946533203125ms
[('C', 'Table'), ('B', 'Table'), ('A', 'E'), ('B', 'A'), ('C', 'B')]
Running time:0.5314350128173828ms
[('C', 'Table'), ('B', 'Table'), ('E', 'Table'), ('A', 'E'), ('D', 'C'), ('B', 'A')]
Running time:1.4970302581787109ms
[('F', 'Table'), ('E', 'Table'), ('D', 'C'), ('E', 'D'), ('F', 'E'), ('I', 'Table'), ('H', 'Table'), ('G', 'F'), ('H', 'G'), ('I', 'H')]
Running time:4.694938659667969ms
[('C', 'Table'), ('B', 'Table'), ('F', 'Table'), ('E', 'Table'), ('I', 'Table'), ('H', 'I'), ('G', 'H'), ('F', 'G'), ('E', 'F'), ('D', 'E'), ('C', 'D'), ('B', 'C'), ('A', 'B')]
Running time:7.707357406616211ms
[('C', 'Table'), ('B', 'Table'), ('F', 'Table'), ('E', 'Table'), ('D', 'B'), ('I', 'Table'), ('H', 'Table'), ('E', 'H'), ('F', 'E'), ('A', 'F'), ('C', 'A'), ('I', 'G')]
Running time:1.8792152404785156ms
[('C', 'Table'), ('B', 'Table'), ('F', 'Table'), ('E', 'H'), ('D', 'F'), ('C', 'D'), ('I', 'C'), ('H', 'E'), ('G', 'I'), ('A', 'G')]

Output

```
(S
  (PERSON Barack/NNP)
  (PERSON Obama/NNP)
  was/VBD
  the/DT
  44th/JJ
  President/NNP
  of/IN
  the/DT
  (GPE United/NNP States/NNPS)
  ./.)
```

Output

```
Natural
Language
Processing
(
NLP
)
subfield
linguistics
,
computer
science
,
artificial
intelligence
concerned
interaction
computer
human
(
natural
)
language
.
```

Output

```
Epoch 1/10
1563/1563 [==============================] - 59s 35ms/step - loss: 1.5293 - accuracy: 0.4440 - val_loss: 1.2957 - val_accuracy: 0.5348
Epoch 2/10
1563/1563 [==============================] - 51s 33ms/step - loss: 1.1756 - accuracy: 0.5822 - val_loss: 1.0875 - val_accuracy: 0.6117
Epoch 3/10
1563/1563 [==============================] - 47s 30ms/step - loss: 1.0224 - accuracy: 0.6392 - val_loss: 0.9826 - val_accuracy: 0.6543
Epoch 4/10
1563/1563 [==============================] - 47s 30ms/step - loss: 0.9237 - accuracy: 0.6745 - val_loss: 0.9453 - val_accuracy: 0.6747
Epoch 5/10
1563/1563 [==============================] - 47s 30ms/step - loss: 0.8503 - accuracy: 0.7006 - val_loss: 0.9059 - val_accuracy: 0.6847
Epoch 6/10
1563/1563 [==============================] - 47s 30ms/step - loss: 0.7858 - accuracy: 0.7248 - val_loss: 0.8872 - val_accuracy: 0.6939
Epoch 7/10
1563/1563 [==============================] - 47s 30ms/step - loss: 0.7376 - accuracy: 0.7400 - val_loss: 0.8755 - val_accuracy: 0.6987
Epoch 8/10
1563/1563 [==============================] - 49s 32ms/step - loss: 0.6901 - accuracy: 0.7582 - val_loss: 0.8597 - val_accuracy: 0.7032
Epoch 9/10
1563/1563 [==============================] - 47s 30ms/step - loss: 0.6397 - accuracy: 0.7738 - val_loss: 0.8642 - val_accuracy: 0.7138
Epoch 10/10
1563/1563 [==============================] - 47s 30ms/step - loss: 0.6069 - accuracy: 0.7867 - val_loss: 0.8733 - val_accuracy: 0.7089
313/313 - 2s - loss: 0.8733 - accuracy: 0.7089 - 2s/epoch - 8ms/step
Test accuracy: 0.708899974822998
```