iterate

February 21, 2025

[1]:
```python
import numpy as np

def sdeliminate(M1, M2):

    M1 = np.array(M1)
    M2 = np.array(M2)

    A1 = list(range(M1.shape[0]))
    A2 = list(range(M1.shape[1]))

    changed = True
    while changed:
        changed = False
        rows_to_remove = [] #save the rows to remove
        for i in A1:
            for j in A1:
                if i != j:
                    if np.all(M1[j, A2] > M1[i, A2]):
                        rows_to_remove.append(i) #save the rows to remove
                        # print("remove_row:",i)
                        break
        if rows_to_remove:
            for r in rows_to_remove:
                if r in A1:
                    A1.remove(r)
            changed = True

        cols_to_remove = [] #save the cols to remove
        for j in A2:
            for k in A2:
                if j != k:
                    if np.all(M2[A1, k] > M2[A1, j]):
                        cols_to_remove.append(j) #save the cols to remove
                        # print('remove_col:',j)
                        break
        if cols_to_remove:
            for c in cols_to_remove:
```

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                if c in A2:
                    A2.remove(c)
            changed = True
    return A1, A2
```

1.

[2]:
```
M1 = [[4, 5, 6],[2, 8, 3],[3, 9, 2]]
M2 = [[3, 1, 2],[1, 4, 6],[0, 6, 8]]
A1, A2 = sdeliminate(M1, M2)
print("A1:", A1)
print("A2:", A2)
```

```
A1: [0]
A2: [0]
```

2. Case 1

[3]:
```
import scipy.io as scio

data = scio.loadmat('iterated_elimination_files\sdeliminate_test_case_1.mat')
M1 = data['M1']
M2 = data['M2']
A1, A2 = sdeliminate(M1, M2)
print("A1:", A1)
print("A2:", A2)
```

```
A1: [0, 3, 4, 5]
A2: [0, 1, 2, 3]
```

Case 2

[4]:
```
data = scio.loadmat('iterated_elimination_files\sdeliminate_test_case_2.mat')
M1 = data['M1']
M2 = data['M2']
A1, A2 = sdeliminate(M1, M2)
print("A1:", A1)
print("A2:", A2)
```

```
A1: [0, 1, 2, 3, 4]
A2: [1, 4, 6, 7]
```