CS222 Homework 4

Stable Matching and Algorithm Analysis

Exercises for Algorithm Design and Analysis by Li Jiang, 2018 Autumn Semester

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1.
```
n = wraps.row
m = wraps.column
weight = Inf, first = 0
for i=n:1
  for j=1:m
    if i==n
      f[j][i]=wraps[j][i]
    else
      rows[3] = [j, j-1, j+1] #3 choices
      if j==1
        rows[1] = m #first row
      if j==m
        rows[2] = 1 #last row
      sort(rows)
      f[j][i] = Inf
      for k=0:3
        if f[rows[k]][i+1] + wraps[j][i] < f[j][i]
          f[j][i] = f[rows[k]][i + 1] + wraps[j][i];
          path[j][i] = rows[k]; #record the path
    if i==1 and f[j][i]<weight
      weight = f[j][i]
      first = j
print(first, end=" ") #output
for i=path[first][1],path[i][j], j=2:n
  print(i)
print(weight)
```

2. This is a 01 Knapsack Problem.

```
dp.length = 10000
dp.item = -1
dp[0]=0
for i=0:n-1
  for j=t-1:playlist[i]
    dp[j]=max(dp[j], dp[j-playlist[i]]+1)
number = time = 0
for j=t-1:0
  if dp[j]>number
    number = dp[j]
    time = j
time+=663
```