Solution to Assignment 3

1. Integer Programming:

$$\begin{aligned} \min \quad & \sum_{i,j} D_{ij} x_{ij} + \sum_{j,k} C_{jk} y_{jk} \\ \text{s.t.} \quad & \sum_{ij} x_{ij} \leq m \\ & \sum_{i} x_{ij} = 1, \\ & \sum_{k} y_{jk} = 1 \end{aligned} \tag{1}$$

$D_{ij} = C_{i,i+1} + \ldots, C_{j-1,j}$.
What is the definition of x_{ij}, y_{ij}?

2. Dynamic Programming:
$F(j,n) = \min_t(f(j,t) + F(t+1,n)), 0 \leq t-j \leq k-1, t \leq n$.
$F(j,n)$ is the minimum value from node j to node n. The optimal value is $F(1,n)$.
Boundary condition: $F(n,n) = C_{1,n}$, $F(n+1,n) = 0$.
$f(j,t)$ is the total cost from node j to node t plus $C_{i,t+1}$, i is the last node in the permutation number from $j+1$ to t because the first node is fixed. Need to consider the special case, $j = t$.
Best solution: $(1|2|3|4,7,5,6|8|9|10|11|12|13,15,14|16|17|18|19|20)$