Week 5

Exercises

E05-01. Implement algorithms of optimal caching and give some examples to test it.

Input:

The first line is size of cache k, initial blocks number n in cache and the number s for the sequence of requests.

The second line is the initial block no in cache

The third line is the block no for the sequence of request.

Output: eviction schedule(when some blocks can be considered at the same time, the longest not used one should be evicted first)

Example:

Input:

3 1 10

1

2 4 3 1 5 3 2 1 4 2

Output:

4 1 5 3

E05-02. Implement Dijkstra algorithms of single-source shortest path and give some examples to test it.

Input: a directed graph with n nodes and e edges, source node s, the length of each edge (x_i, x_j, l)

Output: the shortest distance of other nodes and corresponding path.

Example:

Input:

5 8 1

1 2 2

2 3 2

2 4 1

1 3 5

3 4 3

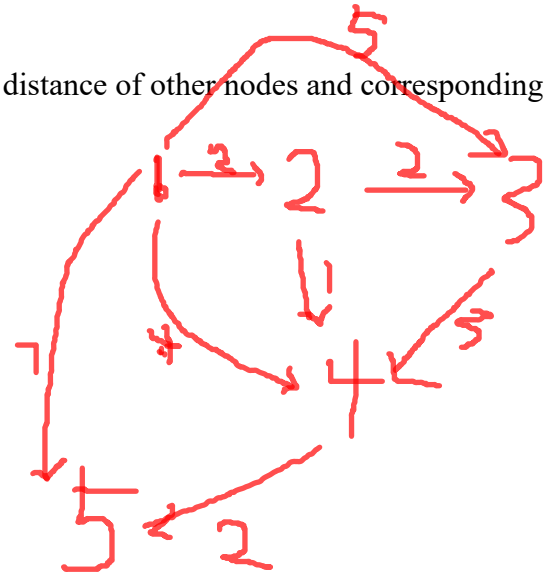
1 4 4

1 5 7

4 5 2

Output:

0 2 4 3 5



E05-03. Implement algorithms of minimum spanning tree and give some examples to test it.

Input: a undirected graph with n nodes and e edges, the length of each edge(x_i, x_j, l)

Output: the sum of all edges in minimum spanning tree.

Example:

Input:

5 8

1 2 2

2 3 2

2 4 1

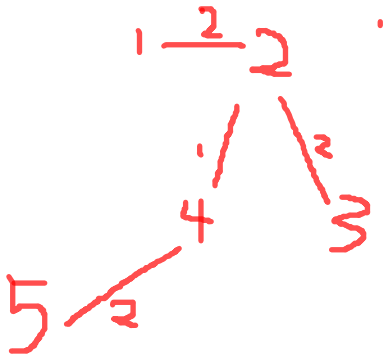
1 3 5

3 4 3

1 4 4

1 5 7

4 5 2



Output:

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