Assignment Report | AED

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The Assignment Problem

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15-11-2019

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1 Introduction

In this report we will approach how we can assign n agents (a) to n tasks (t) such that the total cost (**C**a,t) of assignment is minimized. The matrix of costs is always randomly generated thus the minimum cost can change with every execution independently of the n number of agents/tasks.

2 Methods of Implementation

2.1 Brute Force Method

The Brute Force Method consists in finding all the permutations of agents and tasks and for each permutation calculate the estimated cost through the Matrix of Costs.

Let:

- (int) 'n' be the number of agents/tasks;
- (int) '`permutation_cost`' be a temporary variable of the cost. This value is updated every iteration of the for loop;
- (static int) '`min_cost`', '`max_cost`' be the variables that hold the minimum and max cost value of all permutations;

```
static void generate_all_permutations(int n,int m,int a[n])
{
...
    for (int i = 0; i < n; i++)
        {
            permutation_cost += cost[i][a[i]];
        }
        if(permutation_cost > max_cost)
        {
          max_cost = permutation_cost;
        }
        if(permutation_cost < min_cost)
        {
          min_cost = permutation_cost;
        }
...
}
```