

Module : Operations Research 1

Responsible: Dr. I. Ait Abderrahim

### Tutorial sheet 4

**Problem: Network flow problem (Transportation problem)**

**Task: NorthWest Corner Method**

**Solution: cpp 1**

```
#include <iostream>
#include <vector>
Using namespace std;
int main() {
    int grid[3][4] = {{3, 1, 7, 4}, {2, 6, 5, 9}, {8, 3, 3, 2}}; //
table
    int supply [3] = {300, 400, 500}; // supply
    int demand [4] = {250, 350, 400, 200}; // demand

    int startR = 0; // start row
    int startC = 0; // start col
    int ans = 0;
    // loop runs until it reaches the bottom right corner
    while (startR != 3 && startC != 4) {
        // if demand is greater than supply
        if (supply[startR] <= demand[startC]) {
            ans += supply[startR] * grid[startR][startC];
            // subtract the value of supply from the demand
            demand[startC] -= supply[startR];
            startR += 1;
        }
        // if supply is greater than demand
        else {
            ans += demand[startC] * grid[startR][startC];
            // subtract the value of demand from the supply
            supply[startR] -= demand[startC];
            startC += 1;
        }
    }

    std::cout << "The initial feasible basic solution is " << ans <<
std::endl;

    return 0;
}
```

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**Solution: Python**

```
grid = [[3, 1, 7, 4], [2, 6, 5, 9], [8, 3, 3, 2]] # table
supply = [300, 400, 500] # supply
demand = [250, 350, 400, 200] # demand

startR = 0 # start row
startC = 0 # start col
ans = 0
# loop runs until it reaches the bottom right corner
while(startR != len(grid) and startC != len(grid[0])):
    # if demand is greater than supply
    if(supply[startR] <= demand[startC]):
        ans += supply[startR] * grid[startR][startC]
        # subtract the value of supply from the demand
        demand[startC] -= supply[startR]
        startR += 1
    # if supply is greater than demand
    else:
        ans += demand[startC] * grid[startR][startC]
        # subtract the value of demand from the supply
        supply[startR] -= demand[startC]
        startC += 1

print("The initial feasible basic solution is ", ans)
```

**Correct answer:**