**Question :** SunFire Petroleums produces two types of fuels from 3 different types of oils. Cost and availability of oils is given in the Excel Sheet. Fuel type A should include at least 30% from oil 1, at most 50% from oil 2 and at least 30% from oil 3. Fuel type B should include at most 30% from oil 1, at least 50% from oil 2 and at most 30% from oil 3. Selling price of fuel type A is 1.1$ and Fuel B is 1.2$. At least 10000 litres of both the Fuel types must be produced. Determine the maximum profit SunFire can make.

Also, use the Solver Table to determine the increase/decrease in my profit if the minimum production of fuel type B is decreased to 9000 litres.

**Model :**

i ∈ {A, B}

j ∈ {1, 2, 3}

***Parameters:***

i ∈ {A, B}

j ∈ {1, 2, 3}

Pi: Selling price for a unit of fuel i

Cj: cost of oil j per litre

Uij: Usage of oil j in Fuel i

Mi: Minimum production required for fuel i

 ***Decisions:***

Xij: Litres of Oil type j to be used for Fuel type i

***Objective:***$ $

*Maximize* $\sum\_{j}^{}\left(X\_{ij}×P\_{i}\right)-\sum\_{i}^{}(X\_{ij}×C\_{j})$

***Constraints:***$ X\_{ij}\geq 0$

$X\_{ij}\geq U\_{ij}, for (i, j)\in \{(A, 1), (A, 3), (B, 2)\}$

$X\_{ij}\leq U\_{ij}, for (i, j)\in \{(A, 2), (B, 1), (B, 3)\}$

$\sum\_{j}^{}X\_{ij}\geq M\_{i}$

***Excel Solution :*** The following solution is obtained using Excel Solver: