**DISCUSSION**

The objective here is to minimize the cost associated to the salary, hiring and firing of the teachers. This is done by estimating the optimal number of teachers in each of the four-year time period. The number of teachers at the beginning of each other should satisfy the demand of teachers in that particular year. A balancing equation is required to manage the flow of teachers in each year. Our main constraint is to satisfy the demand of teachers in that year.

**Model**

$C\_{h}$: Cost to hire a teacher

𝑆: Salary of the teacher

$D\_{i}$: Demand for teacher for year 𝑖, 𝑤here 𝑖 ∈ (1,2,3,4)

$C\_{f}$: Cost to fire a teacher

$N\_{0}$: Number of teachers available at the beginning of year 1

**Decisions**

$x\_{i}$: Number of teachers hired in year 𝑖, 𝑤here 𝑖 ∈ (1,2,3,4)

 $y\_{i}$: Number of teachers fired in year 𝑖, 𝑤here 𝑖 ∈ (1,2,3,4)

**Calculated Parameters**

$N\_{i}$ **:** Number of teachers working in year 𝑖, 𝑤here 𝑖 ∈ (1,2,3,4)

$N\_{i}$ = $N\_{i-1}$ + $x\_{i}$ - $y\_{i}$

**Objective**: Minimize Cost

Min $\sum\_{i=1}^{4}N\_{i}$\*S + $x\_{i}$ \*$C\_{h}$ + $y\_{i}$ \* $C\_{f}$

**Constraints**

$N\_{i}$ >= $D\_{i}$ (1) demand for teachers must be satisfied for each year

$x\_{i}$ >= 0 (2) number of teachers hired must be non- negative

$y\_{i}$ >=0 (3) number of teachers fired must be non - negative