AMMM Spring19 Sol

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1 Decision Variables

1. $\mathbb{N} : hired\_base_p \Rightarrow$ # of people hired from base batch
2. $\mathbb{N} : hired\_extra_p \Rightarrow$ # of people hired from extra batch
3. $\mathbb{B} : some\_hired_p \Rightarrow$ Indicator variable taking value 1 if any employee of provider p has been hired.
4. $\mathbb{B} : all\_hired_p \Rightarrow$ Indicator variable taking value 1 if all employees of provider p has been hired.
5. $\mathbb{N} : hired\_1_p \Rightarrow$ # of people hired belonging in the first tax bracket
6. $\mathbb{N} : hired\_2_p \Rightarrow$ # of people hired belonging in the second tax bracket
7. $\mathbb{N} : hired\_3_p \Rightarrow$ # of people hired belonging in the third tax bracket

2 Constraints

1. $\sum_{p \in P} hired\_base_p \leq some\_hired_p \cdot available\_workers_p \ \ \forall p \in P$
2. $all\_hired_p \cdot available\_workers_p \leq hired\_base_p \ \ \forall p \in P$
3. $hired\_extra_p \leq all\_hired_p \cdot available\_workers_p \ \ \forall p \in P$
4. $available\_workers_p/2 \ \cdot \ (some\_hired_p + all\_hired_p) == hired\_base_p \ \ \forall p \in P$
5. $hired\_1_p \leq 5 \ \ \forall p \in P$
6. $hired\_2_p \leq 5 \ \ \forall p \in P$
7. $some\_hired_{p_1} + some\_hired_{p_2} + same\_country_{p_1,p_2} < 3 \ \ \forall p_1, p_2 \in P, p_1 \neq p_2$

3 Cost Function

$z = \$ \sum_{p \in P} cost\_contract_p \cdot some\_hired_p + cost\_worker_p \cdot (hired\_base_p + hired\_extra_p) + hired\_1_p \cdot cost\_1 + hired\_2_p \cdot cost\_2 + hired\_3_p \cdot cost\_3$