Each job must be scheduled to a resource at certain time

$$S_{j,r,t} = \begin{cases} 1 & \text{each job (j) assigned to a resource (r) at time (t)} \\ 0 & \text{else} \end{cases} \quad (1)$$

1 Hard Constraints

- **A resource cannot execute more than one job at a time (Two jobs could not assign to one processor at the same time, no overlapping job)**:
- **A Job must not appear more than once in valid schedule**:
- **A resource must have the enough capability to run the job(The resource must have enough timeslot to run)**:
- **The job must not starts before the job earliest time(Arrival time)**:
- **The job must finish before or equal to the job latest time(Latest Time)**:

2 Soft Constraints

- **The job should starts as early as possible to its early time**:
- **If two jobs start at the same time, the bigger job scheduled to the fastest resource first**
- **One job should not be assign to different resources**
- **The Job should be assigned to the cheapest resource possible**

3 Objective Function

The objective function is the intended function to be optimized . The quality of solution is defined by calculating the violation of soft constraints. For defined problem in this paper, the objective function is calculated as the sum of the number of violations of soft constraints.