AT.CPP

**GRASP** (**G**reedy **R**andomized **A**daptive **S**earch **P**rocedure)

**STEPS:**

**Step\_0:**

* **Initialized all variables, arrays**
* **Read input files and build vector array.**
* **Process Data (some of the data being processed)**
  + **SIM (set of identical machines)**
  + **Lambda (Tooling family with certificate)**

**Step\_1:**

* **Calculate machine-tooling benefit**
* **Build RCL**
* **Select candidate from RCL**

**Step\_1.0:**

* Calculate **Benefit value** for the machine-tooling combination
* Sort machine-tooling combination according to **Benefit value**
* Generate **Candidate List** (**CL**)
  + Note: calculate benefit where machine time horizon is not full
    - Benefit of machine is sum of lot assignment

**Step\_1.1:**

* Build **Restricted Candidate List** (**RCL**) where length is based on random number from 1 – 10 according to calculation of **Probability**.

**Step\_1.2:**

* Select one (1) **Candidate** from the **RCL**, according to calculation of **Probability** (clarify)
* Assigned machine setup; select machine instance from the machine family and tooling instance from the tooling family.

**Update:**

* Machine and Tooling usage
* Available tooling-machine combinations
* Unassigned lots set (remove the lots included in the machine setup calculation for benefit value)

**Loop: to Step\_1.0**

If No. of **Tooling** is greater than zero

&&

If No. of **Machine** is greater than zero

&&

If **unassigned lots set** is not empty

**Step\_2:**

* **BlackBox (solution: linear programming)**
* **Solution: Try to solved shortage for package device and key device**
* **COIN-OR Solver BCP (open source) / CPLEX (commercial license)**

**Step\_3:**

**Step\_3.0:**

* Truncate lot assignment (Xils) obtained from GRASP Step 2

**Step\_3.1:**

* Compute for the benefit of unallocated lots; then sort it non-increasing order (Step 1 & 2)

Step\_3.2:

* Assign lots greedily to the available machines

Update machine/lot information; Loop while (lots > zero && machines > zero)