

## CAD Design Project 2 – Constrained Scheduling

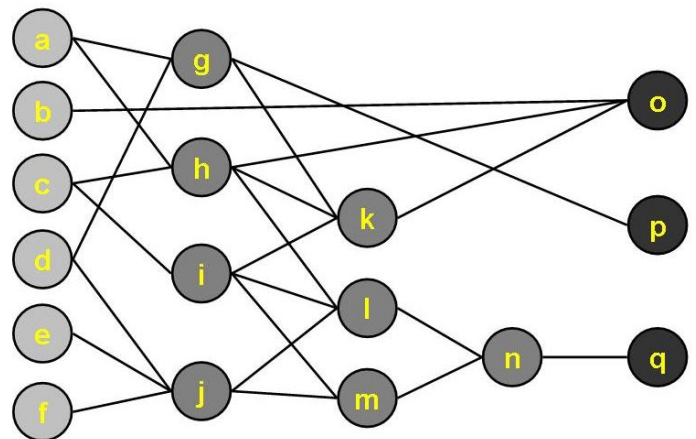
Due: 23:59, Oct. 5, 2022

In this project, you are required to implement two versions of list scheduling algorithms for constrained scheduling problems. (1) The ML-RCS is the scheduling problem to minimize latency under resource constraints. (2) The MR-LCS is the scheduling problem to minimize resource under latency constraint. Your program would be evaluated on Linux environment according to the following requirements.

1. For simplicity, there are only 3 types of Boolean operations: *AND*, *OR*, and *NOT*.
2. Assume that every operation takes 1-cycle latency. **(The PI node is not an operation.)**
3. Read a BLIF file and the corresponding resource or latency constraints.
4. For ML-RCS, use option "-l", output the scheduled result under resource constraints.
5. For MR-LCS, use option "-r", output the scheduled result under latency constraint.
6. Upload your source code tarball (\*.tgz) to moodle (including your Makefile).
- (NOTE: The uploaded file name should be the same with your student ID.)**
7. Generate and upload two "worst cases" with ReadMe file of the run-time parameters.

BLIF Example: sample02.blif

```
.model sample02
.inputs a b c d e f
.outputs o p q
.names a d g
1- 1
-1 1
.names a c h
11 1
.names c i
0 1
.names d e f j
1-- 1
-1- 1
--1 1
.names g h i k
1-- 1
-1- 1
--1 1
.names h i j l
111 1
.names i j m
11 1
.names l m n
11 1
.names b h k o
111 1
.names g p
0 1
.names n q
0 1
.end
```



#### SYNOPSIS for ML-RCS

```
%> list -l BLIF_FILE AND_CONSTRAINT OR_CONSTRAINT NOT_CONSTRAINT
```

##### Run-time Example:

```
%> list -l sample02.blif 2 1 1
Resource-constrained Scheduling
1: {h} {j} {i}
2: {l m} {g} {}
3: {n} {k} {p}
4: {o} {} {q}
#AND: 2
#OR: 1
#NOT: 1
END
```

##### Run-time Example:

```
%> list -l sample02.blif 1 0 1
Resource-constrained Scheduling
No feasible solution.
END
```

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#### SYNOPSIS for MR-LCS

```
%> list -r BLIF_FILE LATENCY_CONSTRAINT
```

##### Run-time Example:

```
%> list -r sample02.blif 5
Latency-constrained Scheduling
1: {h} {j} {i}
2: {m} {} {}
3: {l} {g} {}
4: {n} {k} {p}
5: {o} {} {q}
#AND: 1
#OR: 1
#NOT: 1
END
```

##### Run-time Example:

```
%> list -r sample02.blif 3
Latency-constrained Scheduling
No feasible solution.
END
```