

Coding Test for Cloud S/W Engineer

Requirements:

1. You are required to write a program to solve the problem specified in the "Problem" section below.
2. Please submit your code within 24 hours. If you have not completed coding, just submit the coding you have written.
3. Feel free to choose your favorite language for coding.

Problem:

Given a list of jobs, each job is represented by a job function that does the actual task. The function returns true on success and false on failure.

Each job also has a potentially empty dependent jobs list. All jobs in a job's dependent list must be completed successfully before the job starts. If any of a job's dependency fails, then the job must be skipped.

Need write a job scheduler that does the following:

1. Checks what jobs are ready to run based on the dependency relationship. Start those jobs.
2. Job execution must not block the job scheduler.
3. The job scheduler should periodically report the completed jobs and the jobs' completion status (success or failure).
4. The job scheduler should exit after all the jobs have either completed or skipped due to failure of dependency jobs.

Example inputs:

Each job is represented by an integer id. Duration is the number of seconds needed to execute the job. Success is false indicates that the job execution will fail. Dependent job ids specifies the job ids that this job depends on. An empty array [] means the job has no dependencies.

Example jobs list 1:

job id	duration (seconds)	success	dependent job ids
0	1	true	[]
1	2	true	[]

expected final output:

completed jobs: [0, 1]
failed jobs: []
skipped jobs: []

Example jobs list 2:

job id	duration (seconds)	success	dependent job ids
0	1	true	[]
1	1	true	[]
2	1	true	[0 1]
3	1	true	[0 2]

expected final output:

completed jobs: [0, 1, 2, 3]
failed jobs: []
skipped jobs: []

Example jobs list 3:

job id	duration (seconds)	success	dependent job ids
0	1	true	[]
1	2	true	[]
2	1	false	[0 1]
3	1	true	[0 2]

expected final output:

completed jobs: [0, 1]
failed jobs: [2]
skipped jobs: [3]

Bonus points:

Can detect cyclic dependencies.

Example cyclic dependencies jobs list 4:

job id	duration (seconds)	success	dependent job ids
0	1	true	[2]
1	2	true	[0]
2	1	true	[1]
3	1	true	[]

expected final output:

cyclic dependencies: true