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Example: static scheduling

Problem: Assume a system with tasks and precedence constraints according to the figure below. Timing constraints for the tasks are given in the table. Generate a static schedule for these tasks by simulating preemptive earliest-deadline-first scheduling.

Task	C_i	O_i	D_i
A	4	0	7
B	3	0	12
C	5	0	15
D	1	3	1

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Begin by calculating the LCM of the tasks: $LCM\{15,5\}=15$
 Then generate a new version of the task graph with cycle time 15.

Task	C_i	O_i	D_i
A	4	0	7
B	3	0	12
C	5	0	15
D	1	3	1
D'	1	8	1
D''	1	13	1

Observe that D must execute $15/5 = 3$ times within the cycle, hence instances D' and D'' in the new graph.

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Now generate a schedule by assuming preemptive, earliest-deadline-first scheduling and simulate execution of the tasks:

1. A is scheduled first since it has the earliest deadline among the tasks (A, B, C) that are ready at $t = 0$.
2. D becomes ready at $t = 3$ and preempts A since D's deadline is closer in time.
3. A resumes its execution at $t = 4$ and is finished at $t = 5$.
4. B is scheduled at $t = 5$ and is finished at $t = 8$.
5. D' becomes ready and is scheduled at $t = 8$ since the deadline of D' is closer in time than C's deadline.
6. C is scheduled at $t = 9$.
7. D'' becomes ready at $t = 13$ and preempts C since the deadline of D'' is closer in time.
8. C resumes its execution at $t = 14$ and is finished at $t = 15$.

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Static schedule:

Cyclic time table:
 (A,0,3) (D,3,4) (A,4,5) (B,5,8) (D',8,9) (C,9,13) (D'',13,14) (C,14,15)