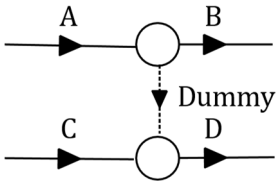
WA MATHEMATICS APPLICATIONS UNIT 4 - DUMMY EDGES IN PROJECT NETWORKS

For the first time in WA external exams, the 2019 project network question required the use of a dummy edge in the network to maintain correct precedence relationships. The SCSA website, syllabus and glossary make no mention of their use and previous examiners, since the early 1990's, have not set questions requiring their use. Several popular WA textbooks make no reference to dummy edges. However, now we've had this warning shot across our bows it would be wise to incorporate their use when teaching project networks from 2020 onwards.

Dummy edges are required when activities share **some** immediate predecessors, but not **all**. A dummy activity will be required from the end of each shared IP to the start of the activity that has other IP's. The weight of a dummy edge is always 0 and they are represented using dotted lines.

Here are two examples to demonstrate their use.

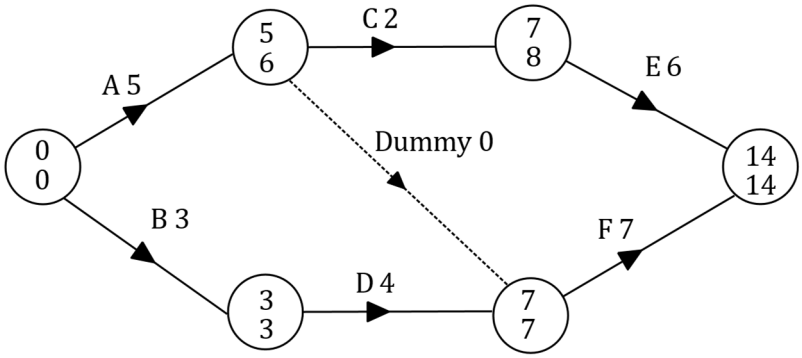
Activity	A	B	C	D
Immediate predecessor(s)		A		A, C



Here, activities B and D share A as an IP but not C.
A dummy edge is required from the end of A (the end of the shared IP) to the start of D (the activity with another IP).

Activity	A	B	C	D	E	F
Immediate predecessor(s)	$-$	$-$	A	B	C	A, D
Duration (days)	5	3	2	4	6	7

Here, activities C and F share A as an IP but not D. A dummy edge is required from the end of A (the end of the shared IP) to the start of F (the activity with another IP).



The top number in each vertex is the earliest start time (EST, determined using a forward scan) for the activity that follows, and the bottom number is the latest finish time (LFT, determined using a backward scan) for the preceding activity.

The latest start time (LST) for an activity is determined using the formula $LST = LFT - \text{Duration}$ and the float time (FT) for an activity is given by $FT = LFT - LST$.