

The Graph Definition File Format

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The graph definition file (GDF) format defines a graph by an adjacency list of source nodes of each incoming edge for each node in the graph in an ASIIC format. It differs from a standard adjacency list giving destination nodes of all outgoing edges. The adjacency list of a node is defined as

`<child name>*<parent 1>,[<parent 2>,....,<parent k>],`

A comma is required after each parent node name. There should be no line for one node if it does not have a parent. Multiple parent nodes can be specified in separate lines and the order of the parents is irrelevant to the graph.

Here is an example of the GDF file.

The Graph Definition File	
Pathway/Candidate File	<- header, required but not interpreted by GLN
10	<- Number of nodes in the network
Gene1*Gene2, Gene3,	<- Gene1 (before *) is the child node name
Gene2*Gene4,	<- Gene4 (after *) is the parent node name
Gene4*Gene1,	
Gene4*Gene2,	
Gene5*Gene6, Gene8, Gene1, Gene7, Gene10,	
Gene6*Gene9, Gene6,	
Gene7*Gene10,	
Gene10*Gene1, Gene2, Gene3, Gene4,	

In GLN modeling, the GDF format is used to define topologies of subgraphs and candidate parents. Using a GDF file can greatly speed up the runtime of GLN on large networks. We use the GDF file to do pathway adaptation analysis or modeling for a network with information about who might be a parent to a child node. The names of the nodes must be consistent with node names appearing in the trajectory collection file.

With option `-z` in GLN, a GDF file specifies exactly a pathway and parents are all included for each node in calculating pathway statistics. With option `-H` in GLN, a GDF file specifies a super graph and parents are enumerated in the list and only the best parent subset is used for each node. GLN also supports separate GDF files for different conditions, in which case the file names should be followed by a comma, e.g. `-z GDF1, GDF2, .`