Decompositions.GraphDecomp.starGraph

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Returns the adjacency matrix and graph Laplacian of the star-expansion of the input hypergraph.

Syntax

```
[adjMat, lapMat] = starGraph(HG)
```

Input

HG - hypergraph object with incidence matrix property obj.IM

Output

- adjMat - adjacency matrix of the star expansion
- lapMat - graph Laplacian matrix of the starexpansion

Disclaimer

Code

```
function [adjMat ,lapMat] = starGraph(HG)
adjMat = [];

H = HG.IM;
de=sum(H,1)';
H=H(:,de>1); % remove edges which represent self loops or empty
eW = HG.edgeWeights;
de=sum(H,1)';

des=eW;
eW1=eW./de;
dvs=H*eW1;
dvs(dvs==0)=Inf; % convention
Dvs=sparse(1:length(dvs),1:length(dvs),1./sqrt(dvs),length(dvs),length(dvs));
Des=sparse(1:length(des),1:length(des),1./sqrt(des),length(des),length(des));
A=Dvs*H*sparse(1:length(eW),1:length(eW),eW,length(eW),length(eW))*Des;
lapMat=A*A'; %normalized projected Laplacian
```

```
end
```

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