Description:
We are currently developing a dynamic graph framework for GPUs, called faimGraph. As the pure representation of such a graph is only part of the appeal of graph processing, deriving interesting metrics from such a graph is typically the reason to manage a graph in the first place. The goal of this thesis is to implement Connected Components for CSR (Compressed Sparse Row) data structures as well as faimGraph. A connected component of an undirected graph is a subgraph in which any two vertices are connected by a path, and which is not connected to the supergraph. Such implementations typically have a lot of optimization potential that can be exploited as much as is permitted by the time frame of the project. Optionally, one could exploit the dynamic setting to avoid re-computation after a graph update.

Objective:
- Implement basic version of Connected Components for CSR on the CPU
- Implement algorithm on the GPU for CSR and faimGraph
- (Optional) Exploit dynamic setting to avoid re-computation after a graph update

Qualifications:
- Experience in C++
- Experience in CUDA, OpenCL or similar parallel computing framework
- Interest in massively-parallel compute architectures and graph processing

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