Distributed Graph Processing

Lecture 13

CSCI 4974/6971

17 Oct 2016

Today's Biz

1. **Reminders**
2. Review
3. Assignment 3
4. Distributed Graph Processing

Reminders

- Assignment 4: out soon - due date TBD
- Project Update Presentation: In class November 3rd
  - Setting up and running on CCI clusters
- Office hours: Tuesday & Wednesday 14:00-16:00 Lally 317
  - Or email me for other availability
- Tentative class schedule:
  - Today: Go over assignment 3; distributed graph representation
  - Thursday: Fully distributed graph processing

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Quick Review

Random graphs

- Erdos-Renyi - uniform random
- Watts-Strogatz - small-world
- Barabasi-Albert - scale-free
- R-MAT - recursive
- Generation: ideally, $O(m)$ time and fully parallelizable

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4. **Distributed Graph Processing**

Graph Representation

Data	Size	Description
n_global	1	Global vertex count
m_global	1	Global edge count
n_local	1	Task-local vertex count
n_ghost	1	Ghost vertex count
m_local_out	1	Task-local out-edges count
m_local_in	1	Task-local in-edges count
out_edges	m_out	Array of out-edges
out_offsets	n_loc	Start indices for local out-edges
in_edges	m_in	Array of in-edges
in_offsets	n_loc	Start indices for local in-edges
map	n_loc+n_gst	Global to local id hash table
local_unmap	n_loc	Array for local to global id conv.
ghost_unmap	n_gst	Array for local to global id conv.
tasks	n_gst	Array storing owner of ghost vertices

Distributed Processing
Blank code and data available on website
(Lecture 13)
`www.cs.rpi.edu/~slotag/classes/FA16/index.html`