Hands-On II:
Ray Tracing
(data parallelism)
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Goal: Build a Parallel Ray-Tracer

We’re providing:

- two scene files
  - scene: a simple 4-sphere scene
  - sphfract: a fractal pattern of spheres
- framework code: c-ray.chpl
  - to read a scene
  - to do the ray tracing computation
  - contains computePixel() routines:

\[
\text{proc computePixel}(y: \text{int}, x: \text{int}): \text{pixelType} \{ \ldots \}
\]
\[
\text{proc computePixel}(yx: 2\times\text{int}): \text{pixelType} \{ \ldots \}
\]

- a helper module to write arrays as PPM or BMP images: Image.chpl
- sample output files (*.bmp, *.ppm)

- These files are available from the hands-on resources page:
  - Also available on swan: /tmp/chapel-ACCU2017 or ~bradc/ACCU2017
Goal: Build a Parallel Ray-Tracer

Your goal is to:

- declare the array of pixel values
- use computePixel() to fill it
  - serially
  - in parallel
  - optionally: promoted
  - optionally: dynamically load-balanced
  - optionally: distributed
    - may make more sense this afternoon
- compare timings for various versions

(You’re also free to pursue any other Chapel coding you like)

- code up a computation of interest to you
- look through primer or benchmark examples in the release
  - $CHPL_HOME/examples
- ...

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