Welcome to KLA's

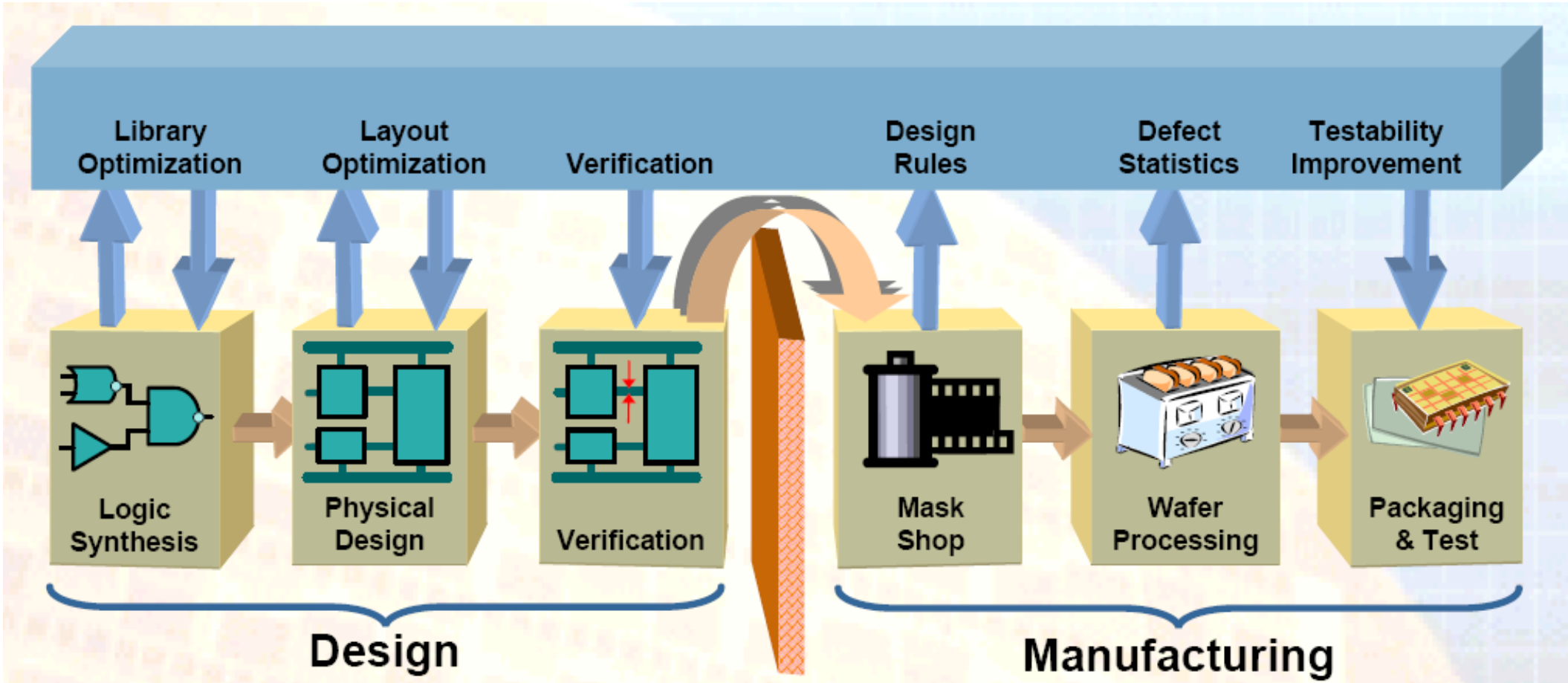
Software Engineering Workshop

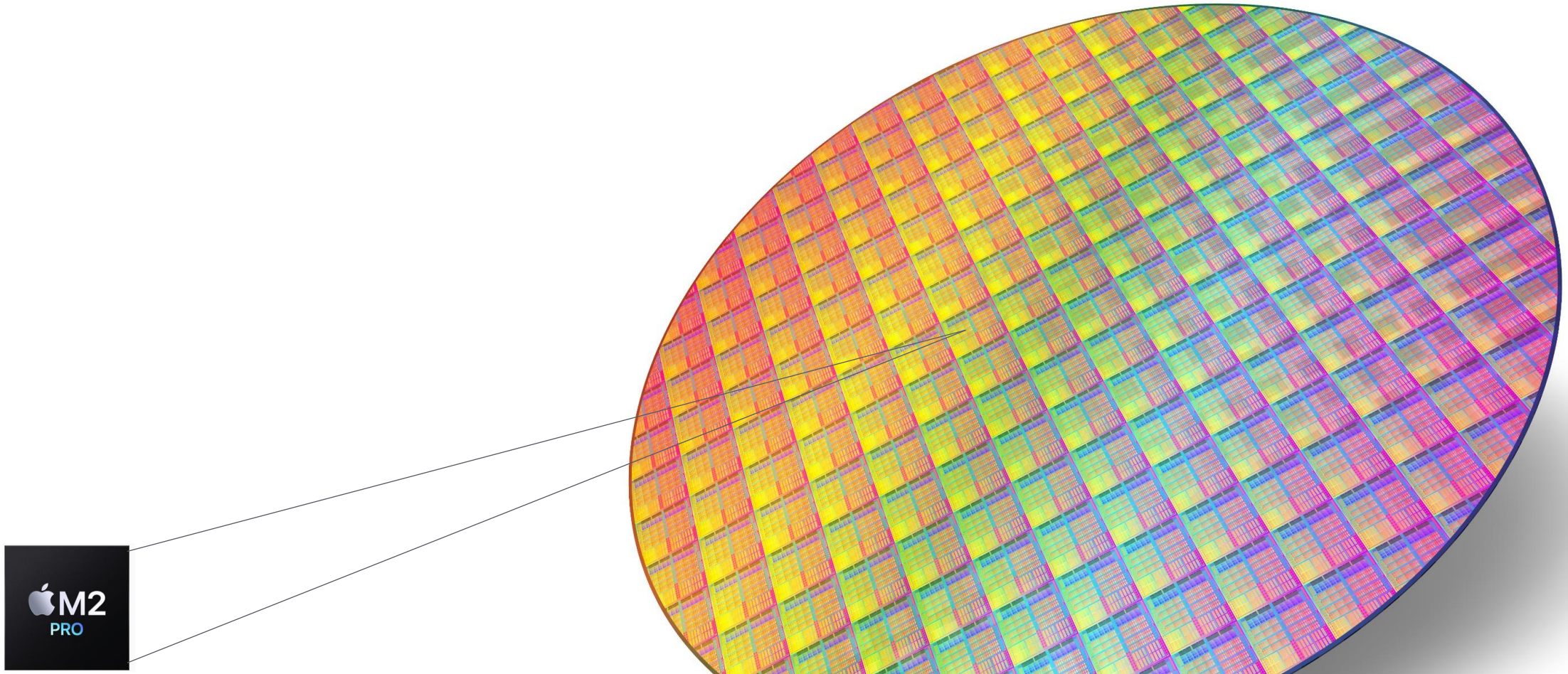
Jan 23, 2023

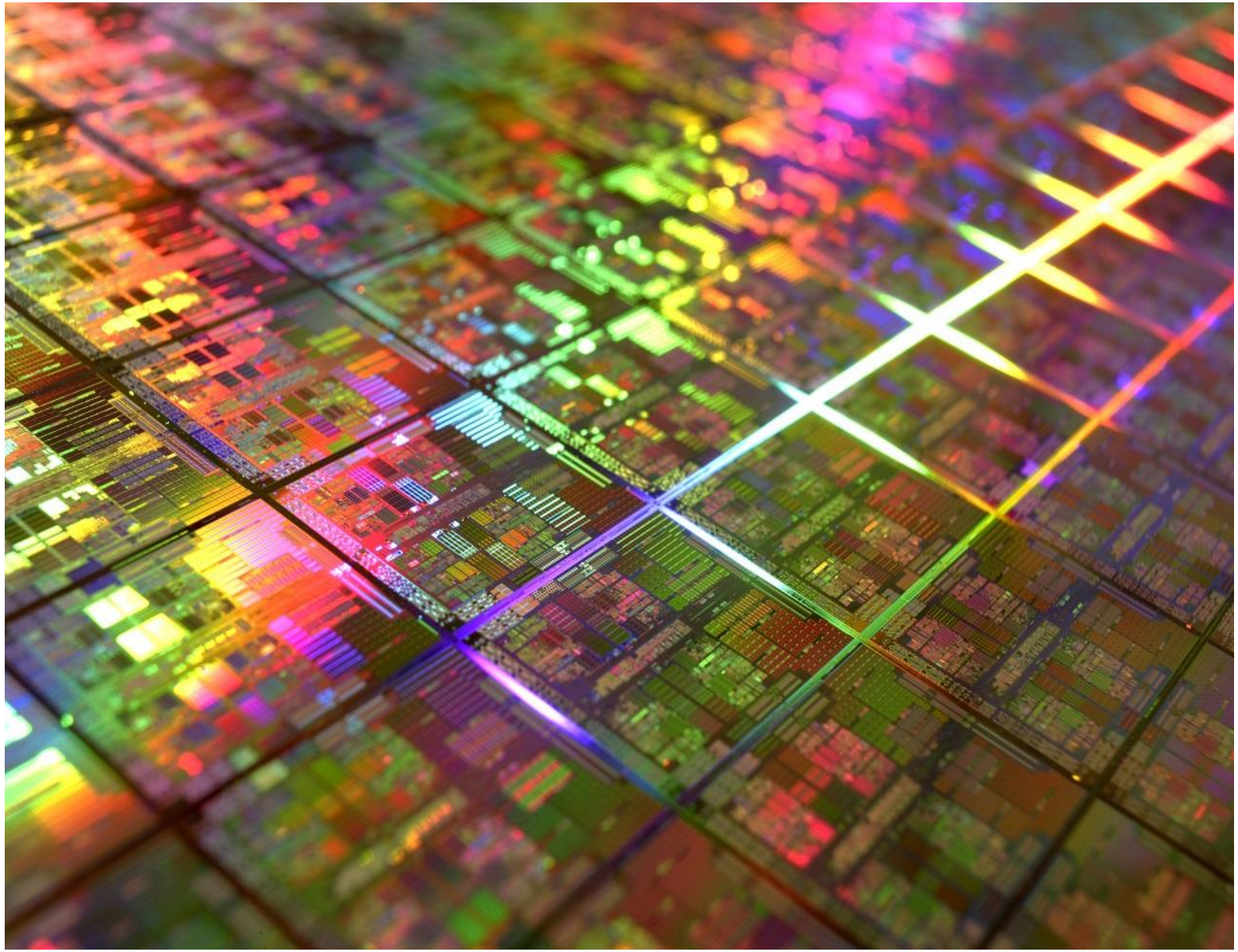
Agenda for the day

- 8:15am: Problem statement description, Q&A
- 8:30am: Students download input dataset & problem description
- 8:35am: Students start investigating & solving the problem
- 9:00am onwards: Mentor assigned to you will check-in and connect
- Mentors will check-in with you hourly and guide
- 10:30am – 10:40am: Break
- 1:00pm – 2:00pm: Lunch
- 3:30pm – 3:40pm: Break
- 5:00pm: Final cut off to submit results and final mentor check-ins
- 6:15pm: Results announcement

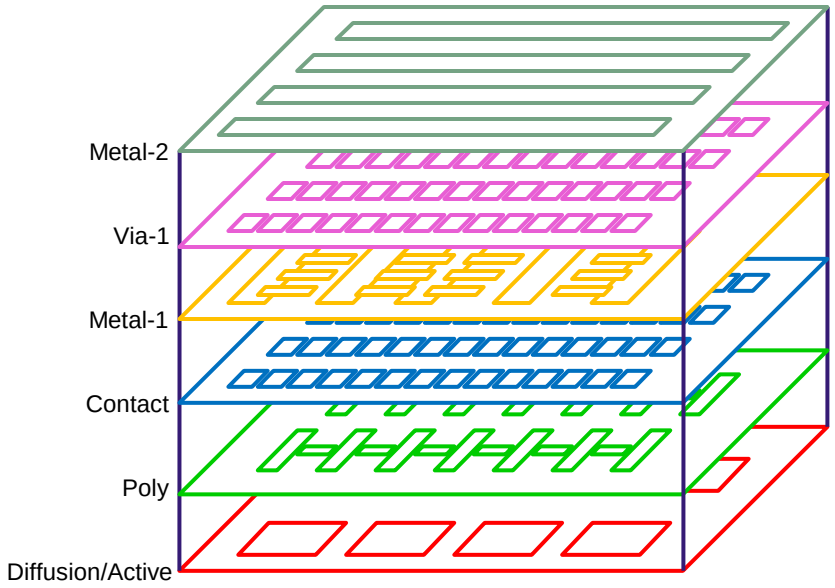

M2
PRO


Library Optimization
Layout Optimization
Verification
Design Rules
Defect Statistics
Testability Improvement
Logic Synthesis
Physical Design
Verification
Mask Shop
Wafer Processing
Packaging & Test
Design
Manufacturing

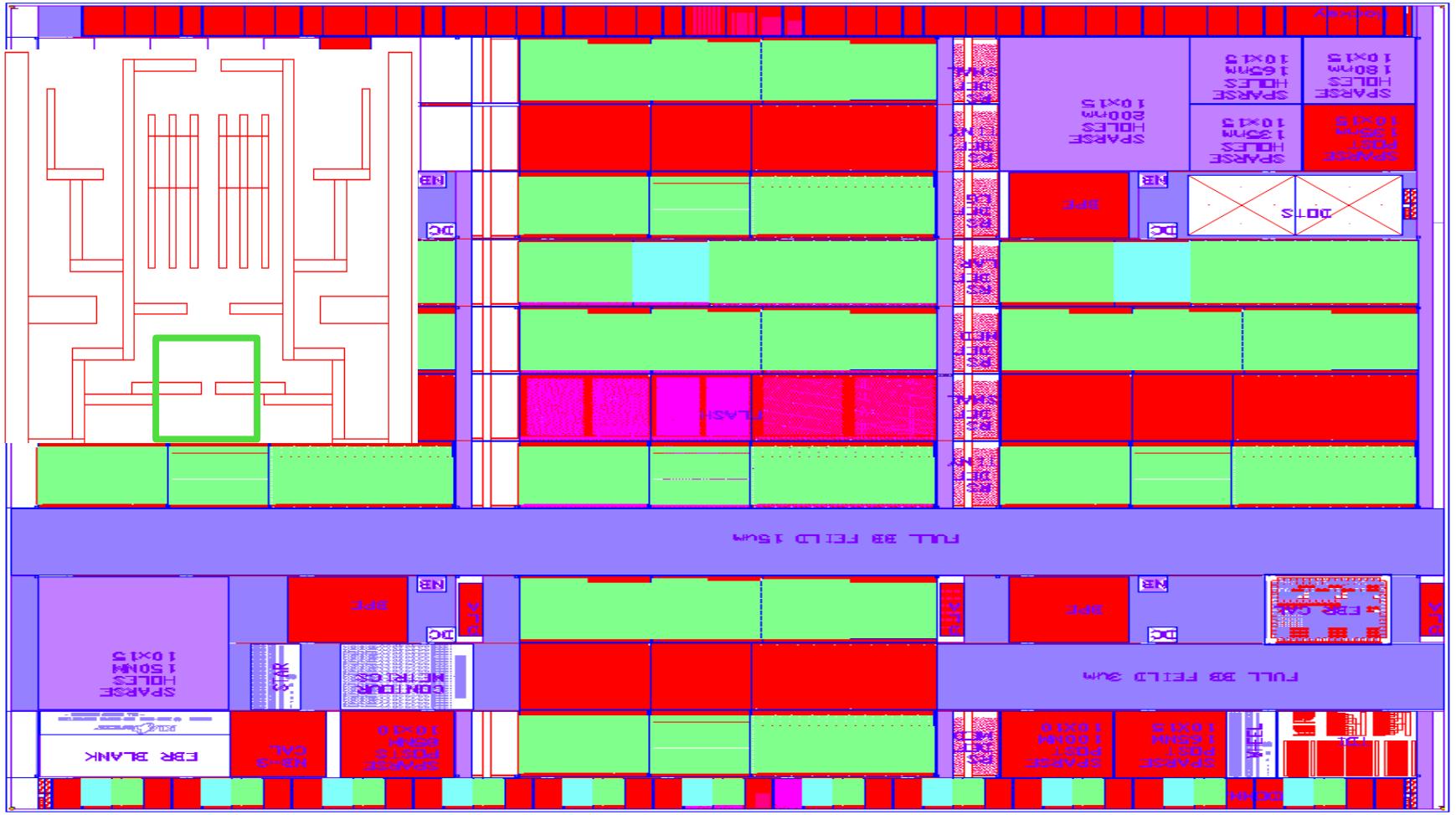

M2
PRO

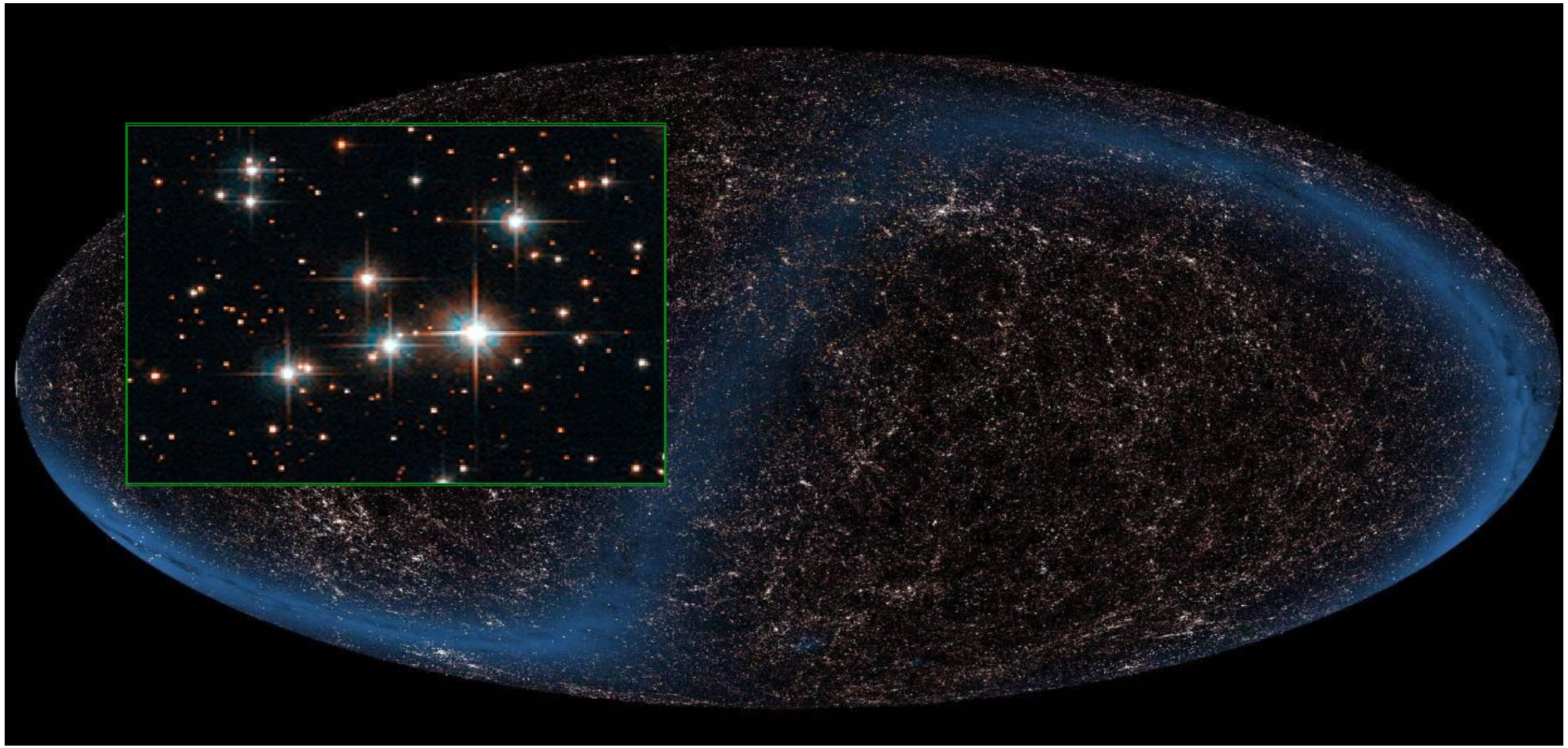


Multiple layers in a Chip Design



Weak spot

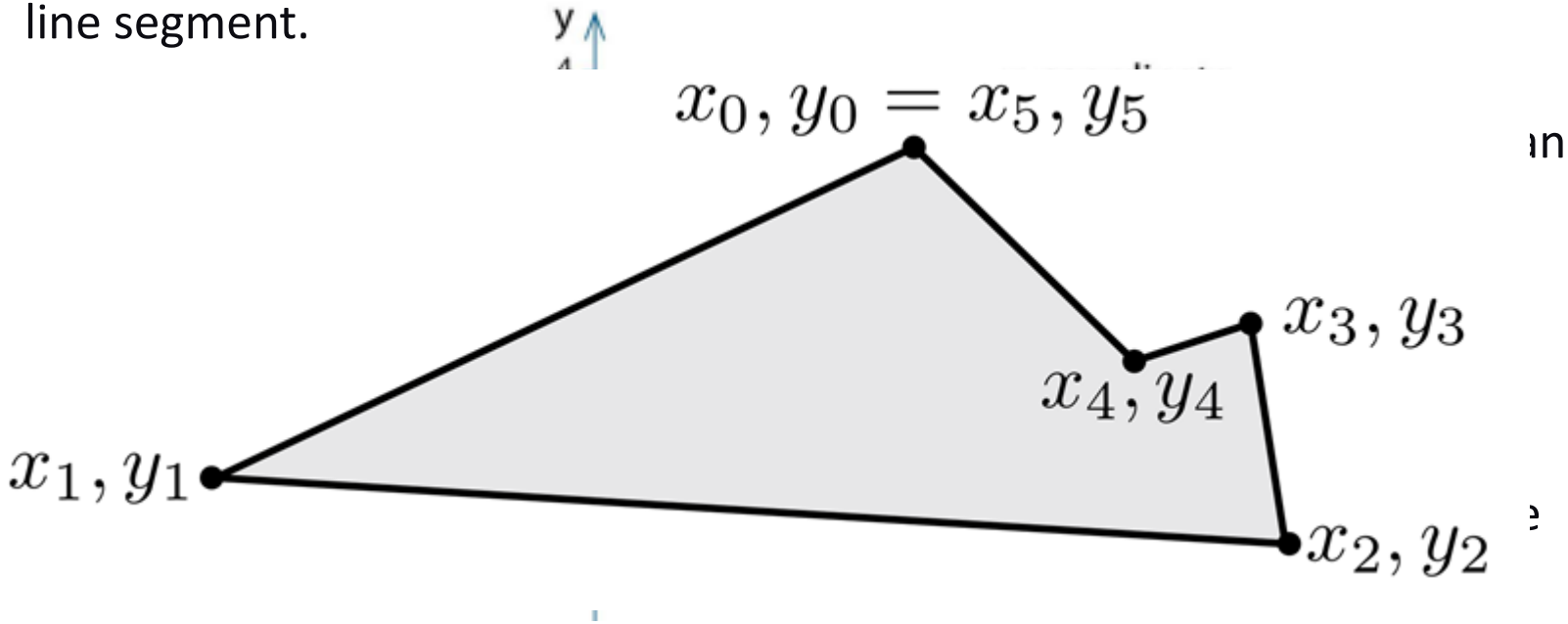

FULL 3B FIELD 15um
FULL 3B FIELD 3um
FLASH
DOTS
SPARSE HOLES 200NM 10X15
SPARSE HOLES 165NM 10X15
SPARSE HOLES 180NM 10X15
SPARSE HOLES 150NM 10X15
SPARSE POST 135NM 10X15
SPARSE POST 130NM 10X15
SPARSE POST 100NM 10X15
SPARSE POST 120NM 10X15
SPARSE POST 125NM 10X10
CONTOUR METRICS
FBR BLANK
FBR CAL
3PF
NB-3 CAL
NE
DC



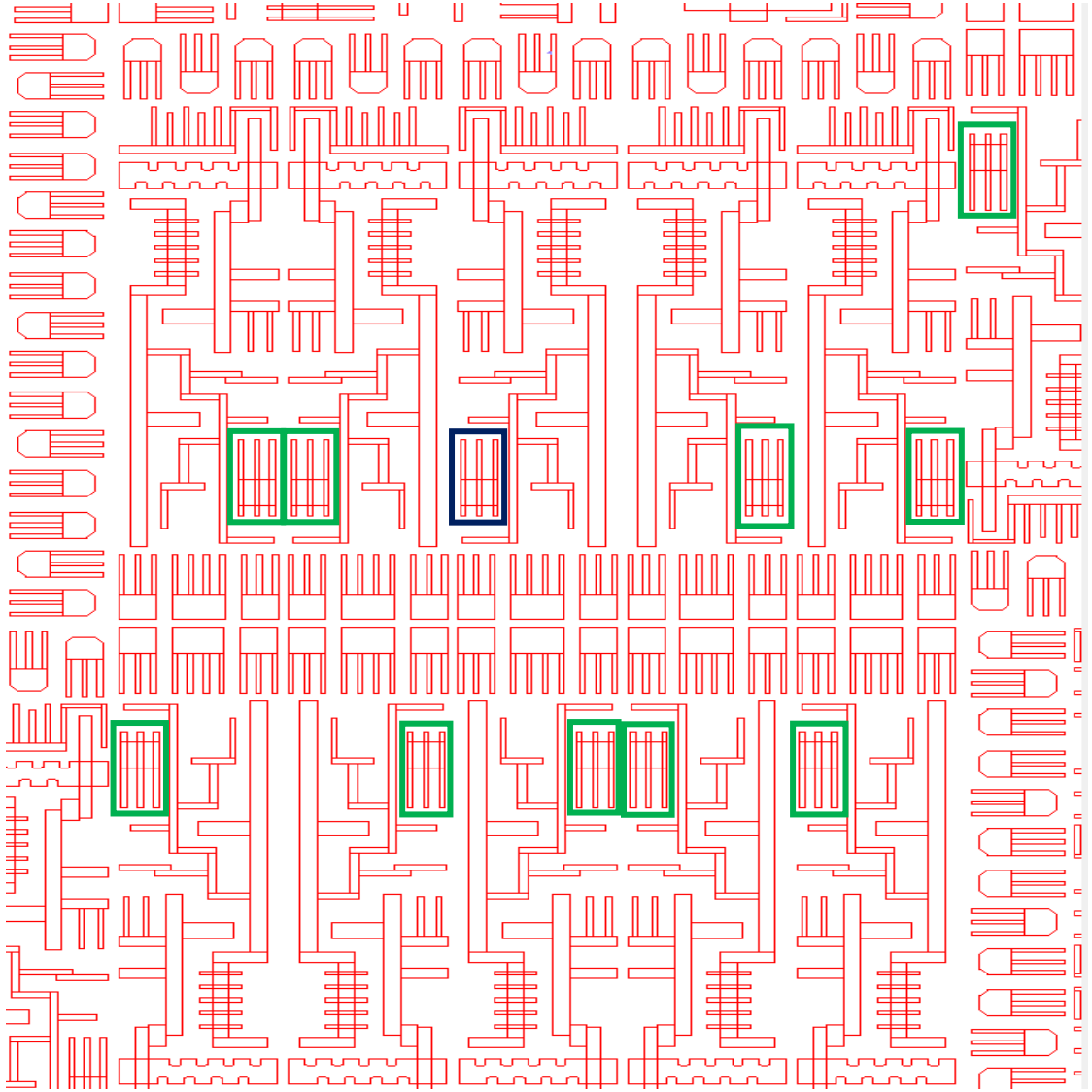
Problem statement

Problem Introduction: Terminologies

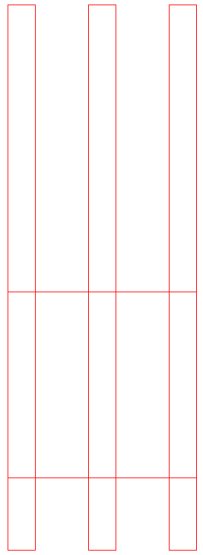
- Point – A point is a (x, y) location in a two dimensional plane.
- Polygon – A polygon is a series of vertices that are inter-connected through line segment.



Search Area

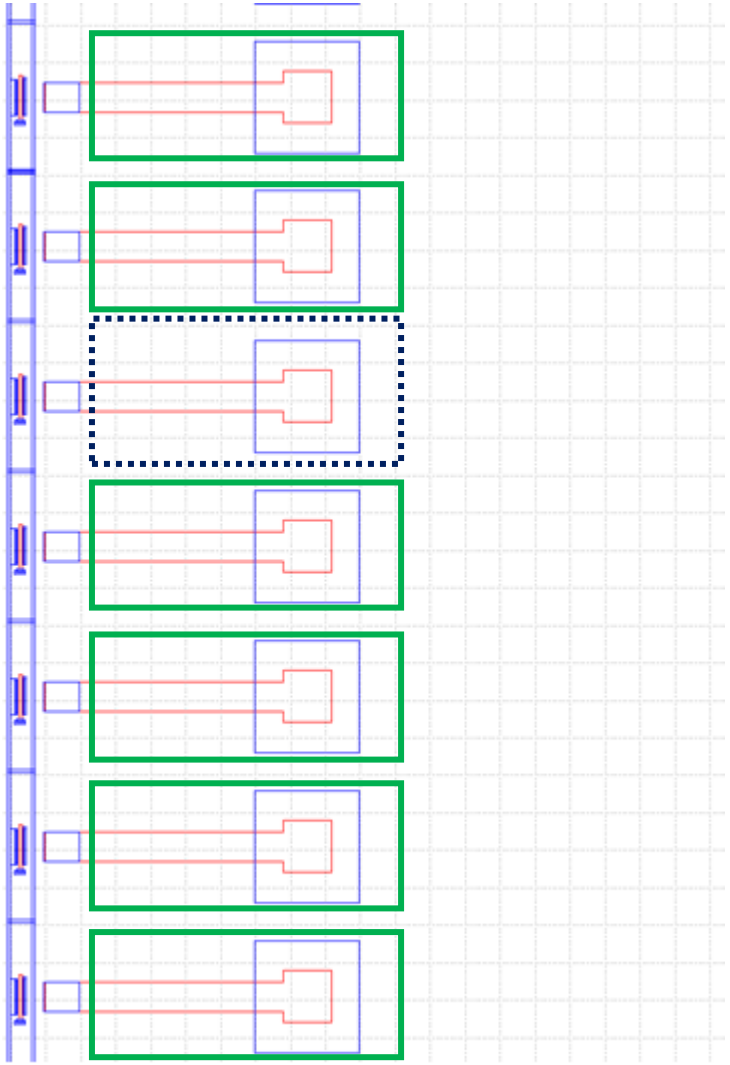


Template Polygons

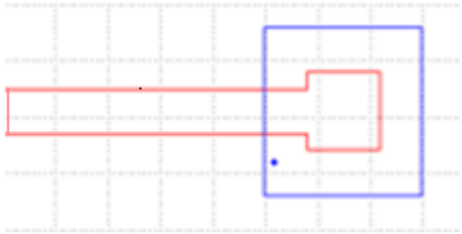


Matched Polygons

Search Area



Template Polygons



Matched Polygons

Requirements

- Search all Polygons given in Template file in a given source polygon sets.
- Print all matched Polygons to the output file in the same format as template file.

Input and Output

- Input
  - Search area (List of polygons)
  - Template polygons (To be searched)
- Output
  - Design approach
  - Working solution
  - Result file (same as template file shared)
- Validation of results
  - Use validation utility to get Accuracy & Purity of results

Sample File format

```
    boundary
        layer 255
        datatype 0
        xy   5   0 0   22800000 0   22800000 22800000   0
22800000
                 0 0
        endel
    boundary
        layer 2
        datatype 0
        xy  15   525270 8663518   525400 8663518   525400 8664818
525660 8664818
                 525660 8663518   525790 8663518   525790 8664818
526050 8664818
                 526050 8663518   526180 8663518   526180 8665398
525980 8665598
                 525470 8665598   525270 8665398   525270 8663518
        endel
    boundary
        layer 2
        datatype 0
        xy  15   526630 8624728   526760 8624728   526760 8626028
527020 8626028
                 527020 8624728   527150 8624728   527150 8626028
527410 8626028
                 527410 8624728   527540 8624728   527540 8626608
527340 8626808
                 526830 8626808   526630 8626608   526630 8624728
        endel
```

One Polygon

Layer

N, Vertices

Ignore datatype field

32 bit signed integers

Supported output formats

```
boundary CRLF
layer 1 CRLF
datatype 0 CRLF
xy  13  1213030 0  1213030 1100  1211830 1100  1211830 1990  1213030 1990  1213030 3300  CRLF
1214130 3300  1214130 1990  1215510 1990  1215510 1100  1214130 1100  1214130 0  1213030 0 CRLF
endel CRLF
```

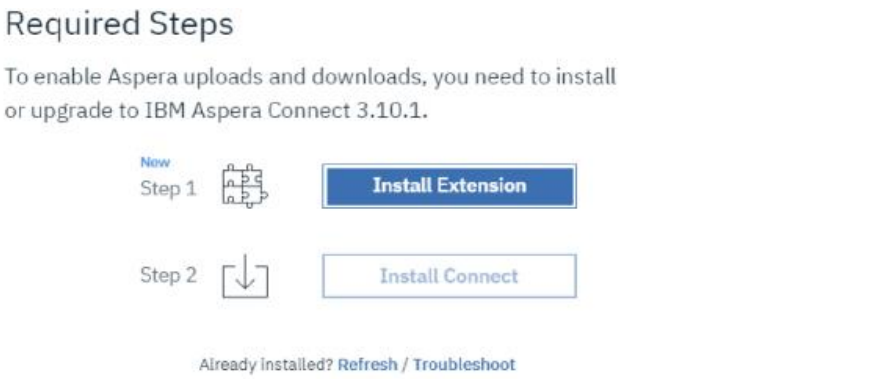
```
boundary layer 1datatype 0 xy  13  1213030 0  1213030 1100  1211830 1100  1211830 1990  1213030 1990  1213030 3300 CRLF
1214130 3300  1214130 1990  1215510 1990  1215510 1100  1214130 1100  1214130 0  1213030 0 CRLF
endel CRLF
```

Datasets

Milestones	Description	File Size
Milestone 1	Output Format verification step	~1 kb
Milestone 2	Single Polygon, dataset1	139 kb
Milestone 3	Single polygon, dataset2	5k
Milestone 4	2 Polygons, dataset1	24 MB
Milestone 5	500 MB file input	500 MB
Milestone 6	Single polygon, dataset3	727 kb
Milestone 7	2 Polygons, dataset2	671 kb

Instructions

- Student Input Location (Input files, Validation utility, Problem statement pdf, dependent files)
  - FTP link https://fft.kla-tencor.com/ (install browser-based plugin IBM Aspera connect)
    - Username: **u**niversityworkshop2023
    - Pwd: **U**niversityworkshop**-**2023
  - Select “universityworkshop2023” folder on the left pane.
  - Select one of the file or a folder for download.
  - It will popup to install plugins.
    - select Install extensions. After install , you will be able to download files.



  - KLA Github Account: klauniversityworkshophiring@gmail.com

Thank you