Technische Universität Braunschweig

Parallel Computing

Exercise 7

Andres Rodriguez, 25th June 2015

Homework 7 - Remember

- ✓ **Deadline**

  07.05.2015 - 11:59:pm

- ✓ **E-mail**

  Andres Rodriguez
  a.rodriguez-escobar@tu-braunschweig.de

- ✓ **Content**

  ZIP file including
  - Source code
  - Written report as *.pdf file

Homework 7

Data Files Walkthrough

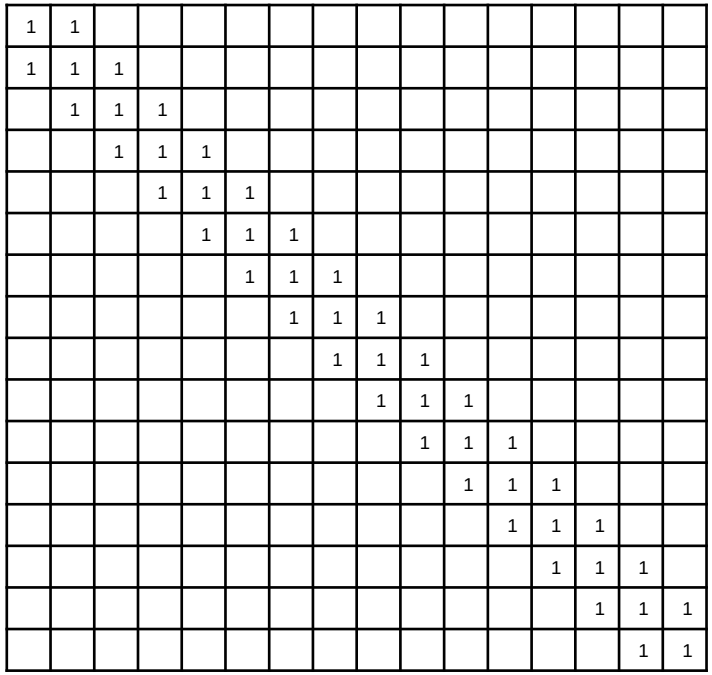
Homework 7

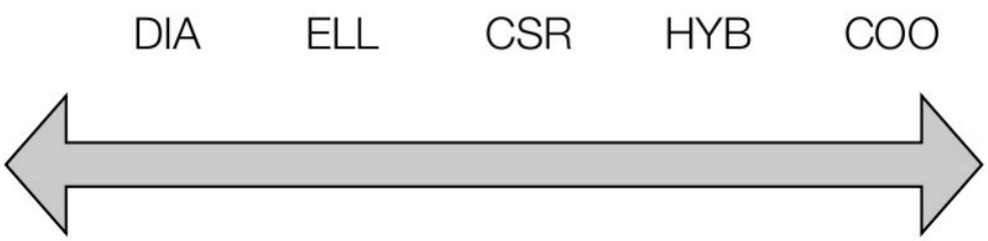
Which matrix data structure?

data0.dat

```
16 46
0 0 1.0000000000
0 1 1.0000000000
1 0 1.0000000000
1 1 1.0000000000
1 2 1.0000000000
2 1 1.0000000000
2 2 1.0000000000
2 3 1.0000000000
3 2 1.0000000000
3 3 1.0000000000
3 4 1.0000000000
4 3 1.0000000000
4 4 1.0000000000
4 5 1.0000000000
5 4 1.0000000000
```

Texto plano | Ancho de la tabulación: 8 | Ln 47, Col 19 | INS





DIA -> Diagonal
ELL -> ELLPACK
CSR -> Compressed Spare Row
HYB -> Hybrid (ELL + COO)
COO -> Coordinate

Homework 7

Framework C-File Walkthrough

Homework 7

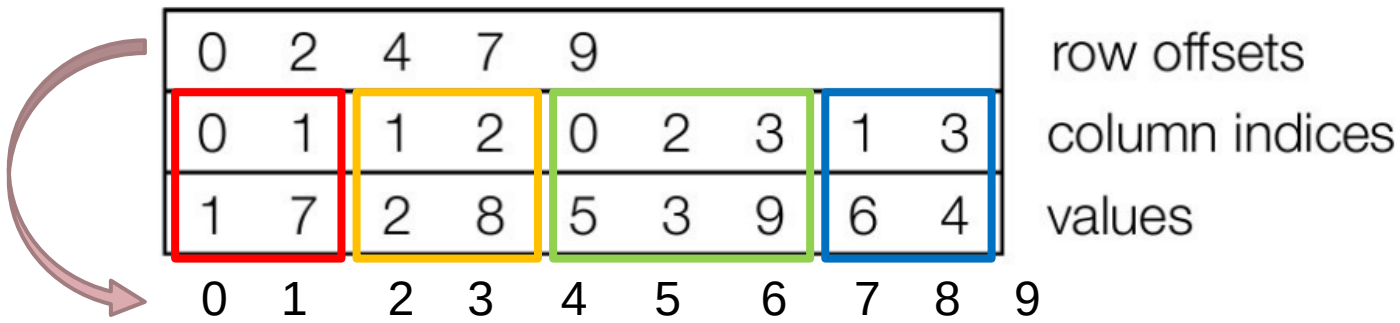
Summarizing

- Commpressed Spare Row is Used

Considering 4 Processes

- Process 0
- Process 1
- Process 2
- Process 3

1	7	0	0
0	2	8	0
5	0	3	9
0	6	0	4



Homework 7

Ideas for other Matrix Data Structures?

- **Full Matrix**

1	7	0	0
0	2	8	0
5	0	3	9
0	6	0	4

- **Diagonal (DIA)**

values

*	1	7
*	2	8
5	3	9
6	4	*

rows

diagonals

- **ELLPACK (ELL)**

values

1	7	*
2	8	*
5	3	9
6	4	*

rows

entries per row

column indices

0	1	*
1	2	*
0	2	3
1	3	*

Ideas for other Matrix Data Structures?

Considering 4 Processes

Process 0 Process 1 Process 2 Process 3

- **Full Matrix**
- **Diagonal (DIA)**
- **ELLPACK (ELL)**