Innovative Assignment 1

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I. Introduction

Aim of this assignment is to produce feature matrix for various multidimensional indexes.

II. Feature Matrix

The merits and demerits of below listed indexes are compared:

- Hash Based
  - Grid File
  - Partitioned Hash
- Tree Based
  - Multi-key
  - kd-Tree
  - Quad Tree
  - R Tree

Table 1: Feature Matrix for Multidimensional Indexed

Query	**Hash Based**		**Tree Based**			
Type	Grid	Partitioned Hash	MultiKey	kd-Tree	Quad Tree	R Tree
Exact Match	✔	✔	✔	✔	✔	Reasonable
Partial Match	✔	✔	works only for first key	✔	✔	✔
Range	✔	✗	✗	✔	✔	✔
Nearest Neighbour	✔	✗	✗	Reasonable	✔	Reasonable
Where am I	N/A	N/A	N/A	N/A	N/A	✔
Balanced Tree	N/A	N/A	✔	✗	✗	✔
# of empty nodes or buckets	High (if large data file)	–	–	–	High [Sol: keep only Not-NULL pointer only]	N/A
Splitting	Easy	Hard	N/A	N/A	N/A	N/A
Splitting Point	Distribute Data	N/A	N/A	any point that distribute data	centre point always	N/A