2006 Paper 7 Question 16

Additional Topics

(a) What is an $(m, M)R$-*Tree*? Explain how new items can be inserted and how *range queries* can be evaluated. [6 marks]

(b) Explain the trade-off in varying m between small and large values. If the dataset is known in advance, would a large or small value of m be appropriate? [4 marks]

(c) R^+-*Trees*, R^*-*Trees*, and *QSF-Trees* are special forms of R-Tree. Explain how each differs from the basic R-Tree and what advantage is presented by each modification. [2 marks each]

(d) As private motor cars increase in electronic sophistication, Sentient Computing becomes ever more applicable. Describe *two* context-aware behaviours that a car's electronic systems could exhibit, making use of general-purpose processing power, data storage, and wireless data communication. [2 marks each]