**Bonus Assignment #5**

**COEN241 Cloud Computing**  
**Department of Computer Engineering**  
**Santa Clara University**

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**Problem 1**

A BCube\(_k\) (\(k \geq 1\), with level 0 to level \(k\)) is built recursively from \(n\) BCube\(_{k-1}\) with \(n^k\) \(n\)-port switches, each node is represented by a \((k+1)\)-number (with each number from 0 to \(n-1\)). In case of \(k = 3\) and \(n = 4\), what is the length of the shortest path (in terms of hops) from node 0000 to node 3333 in the BCube\(_k\) (assume one hop per switch)? How many possible shortest paths are there? How many possible parallel shortest paths are there? Please show one of the possible shortest paths (or a sequence of nodes)?

**Problem 2**

True or false (yes or no, 1 or 0) problems with wrong-answer penalties:

a) Compute and storage services belong to PaaS.

b) Fabric computing prefers to use high speed bus to connect all servers in the data center.

c) GPU can do graphic and DSP operations, but cannot do general purpose application.