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CSC375-01

Winter 2009

5.9, 5.10, 5.11, 5.12, 5.15, 5.17, 5.18

Homework 8

5.9a) D = 4, P = 4; node = D + 3P, overhead = 3P; fraction of overhead = ( 3 ( 4 ) ) / ( ( 4 ) + 3 ( 4 ) ) = 75%

5.9b) D = 16, P = 4; node = D + 2P, overhead = 2P; fraction of overhead = ( 2 ( 4 ) ) / ( ( 16 ) + 2 ( 4 ) ) = 33.33%

5.9c) n-many Leaves: D = 8, P = 4; node = D + 2P;

n-many Internal nodes: D = 8, P = 4; node = D + 2P;

nodes = ( n +n )( D + P ) + 2nP; overhead = 2nP +2nP = 4nP;

fraction of overhead =

5.9d) n-many Leaves: D = 8; node = D;

n-many Internal nodes: P = 4; node = 2P;

nodes = ( nD + 2nP ); overhead = 2n;

fraction of overhead =

Leaf nodes store 4 bytes of data; internal nodes store 4 bytes of pointers.

The formula looks as follows, given that there are *x* internal nodes and

*x* leaf nodes:

4*x*

4*x* + 4*x*

= 4*/*8 = 50%*.*

Since every node stores 16 bytes of data and 8 bytes of pointers, the

overhead fraction is 8*/*24 ≈33%