COMP9315 Sample Exam, Q6 Sample Solution

(a)

(i) Sel[a=5] ... 1000/16 = 63

(ii) Sel[b=green] ... 1000/8 = 125

(iii) Sel[c>80] ... 1000*20/100 = 200

(iv) Sel[null(a)] = 0

(b)

(i)
For 128 pages, d = 7

(ii)
max(d_a) = 4, limited by domain(0..15)
max(d_b) = 3, limited by domain(Colours)
max(d_c) = 7, limited by domain(1..100)

(iii)
Possible min cost allocation(s):
d_a = 3, d_b = 3, d_c = 1
d_a = 4, d_b = 3, d_c = 0
d_a = 3, d_b = 4, d_c = 0 ... but over-allocates to d_b

(iv)
Cost for bit allocations:

Q1 = (a,?,?) 0.3 Q2 = (?,b,?) 0.2 Q3 = (a,b,?) 0.3 Q4 = (?,b,c) 0.2
d(a,b,c) = (3,3,1) Cost = 0.3*2^4 + 0.2*2^4 + 0.3*2^1 + 0.2*2^3 = 10.2
d(a,b,c) = (4,3,0) Cost = 0.3*2^3 + 0.2*2^4 + 0.3*2^0 + 0.2*2^4 = 9.1
d(a,b,c) = (3,4,0) Cost = 0.3*2^4 + 0.2*2^3 + 0.3*2^0 + 0.2*2^3 = 8.3