Computing Huffman Code for Valences

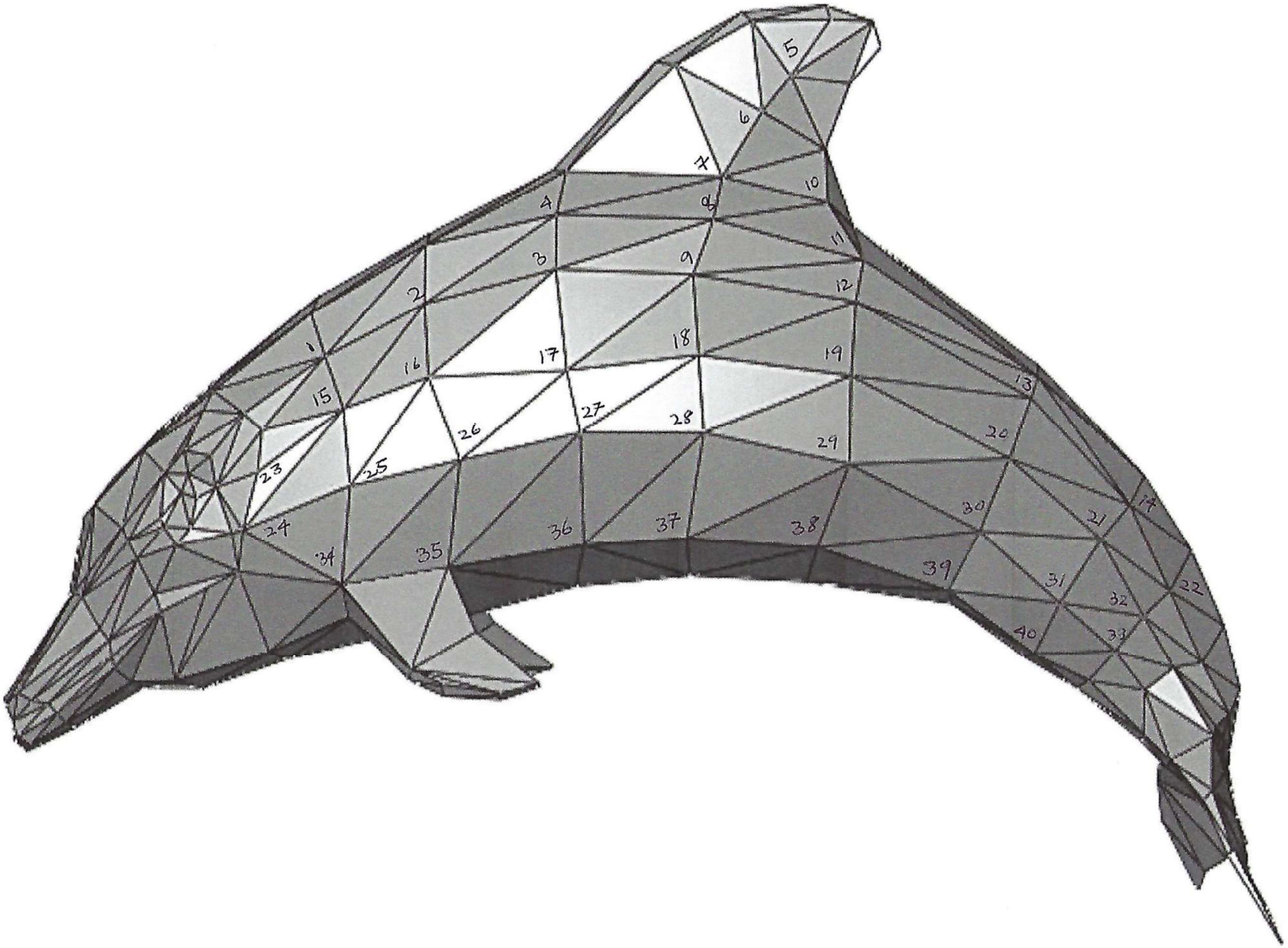
Determine the Valences of the 40 Vertices marked on the Dolphin Mesh on the next slide. (Valence of a vertex is equal to the number of vertices adjacent to it.)

Represent the Valence Values and the Number of Vertices with a Specific Value in a Table like the Table on the Left in Slide 4.

Determine the Huffman codes of the various valence values, like for the example in Slide 4.

Determine the Average Number of Bits needed to Represent the Valences of the 40 Vertices marked on the Dolphin Mesh, like for the example in Slide 4.

Show your work on Slide 5 & Submit this slide only using the link on eClass.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EXAMPLE: Computing the Huffman Code for Valences

Given 1000 vertices consider the following frequency of different valences. What is the average bits/vertex needed to store the connectivity information in this case if we use the Valence Driven representation with Huffman Coding? (Show your derivations below.)

3	10
4	60
5	150
6	600
7	100
8	70
9	10

Symbol/Code	prob					
6 (0)	0.6					0.6 (0)
5 (100)	0.15 (100)				0.25 (10)	0.40 (1)
7 (101)	0.10 (101)					
8 (111)	0.07 (111)			0.15 (11)		
4 (1100)	0.06 (1100)		0.08 (110)			
3 (11010)	0.01 (11010)	0.02 (1101)				
9 (11011)	0.01 (11011)					

Average bits/vertex = 1 x 0.6 + 3 x 0.32 + 4 x 0.06 + 5 x 0.02 = 1.9 bits/vertex

Work Space: Computing the Huffman Code for Valences for the 40 Dolphin Vertices

Show your derivations below. You may need to Adjust the Number of Rows and Columns in the Tables below.

Symbol/Code	prob					

Average bits/vertex =