

2161603 – Data Compression and Data Retrieval

B.E Semester: 6 – IT (GTU)

Assignment – 1

170630116001 170630116002 170630116003 170630116004 170630116005	<ul style="list-style-type: none">Define the following terms: Compression Ratio, Entropy, Distortion, Data Retrieval, Query Optimization, HINT and Run Length Coding.What is uniquely decodable code, explain? Determine whether the following codes are uniquely decodable or not in details.<ol style="list-style-type: none">{0,01,11,111}{0,01,110,111}{0,10,110,111}{1,10,110,111}Encode “aacdeaab” using Adaptive Huffman code. Derive Output string, Codes and final tree.Determine the minimum variance Huffman code with the given probabilities. $P(a_2) = 0.4$, $P(a_1) = 0.2$, $P(a_3) = 0.2$, $P(a_4) = 0.1$, $P(a_5) = 0.1$Explain modeling and coding. Explain how this will help to reduce entropy for following data. 9,11,11,11,14,13,15,17,16,17,20,21
170630116006 170630116008 170630116009 170630116010 170630116011	<ul style="list-style-type: none">What do you mean by lossless compression? Compare lossless compression with lossy compression.Find the frequency of each character and Encode the following string using Huffman Coding Method → “beep boop beer!”Explain update procedure of adaptive Huffman coding with suitable example.Explain using suitable diagram the audio compression techniqueGenerate GOLOMB code for $m=9$ and $n=8$ to 13
170630116012 170630116013 170630116016 170630116017 170630116018	<ul style="list-style-type: none">Define: self-information, entropy, lossless compression, lossy compression, data compressionExplain Markov Model with example.Draw the of Encoding procedure of Huffman coding and explain with example.Generate GOLOMB code for $m=5$ and $n=4$ to 10.Consider a source emits letter from a alphabet $A=\{a_1,a_2,a_3,a_4\}$ with probability $P(a_1)=0.3, P(a_2)=0.2, P(a_3)=0.35, P(a_4)=0.15$. [I] Find a Huffman code using minimum variance procedure. [II] Find average length of the code.
170630116019 170630116020 170630116021 170630116022 170630116023	<ul style="list-style-type: none">Compare Lossless Compression with Lossy Compression and differentiate between these two.Draw the flowchart of Decoding procedure of Huffman coding and explain with exampleExplain Huffman Coding with suitable example.Generate GOLMB code for $m=5$ and $n=0$ to 10.Given an alphabet $A = \{a_1, a_2, a_3, a_4\}$, find the first order entropy in the following cases:<ol style="list-style-type: none">$P(a_1) = P(a_2) = P(a_3) = P(a_4) = 1/4$$P(a_1) = 1/2, P(a_2) = 1/4, P(a_3) = P(a_4) = 1/8$$P(a_1) = 0.505, P(a_2) = 1/4, P(a_3) = 1/8$ and $P(a_4) = 0.12$

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| 170630116024
170630116025
170630116027
170630116028
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170630116030 | <ul style="list-style-type: none">• Explain modeling and coding with suitable example.• What is data compression? Compare lossy and lossless compression.• Draw the necessary tree for the sequence “aardv” using the update procedure of Adaptive Huffman Coding.• Write a short note on Prefix Code.• Design Huffman code using Huffman tree for the following symbols. |
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Symbol	A	B	C	D	E	F
Count	30	15	10	8	5	2

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| 170630116031
170630116032
170630116033
170630116034
170630116035
180633116001 | <ul style="list-style-type: none">• Decode the following string 00000101000100000110001011001000100001010 Using Adaptive Huffman Coding technique.• Generate TUNSTALL code $P(A)=0.4$, $P(B)=0.3$, $P(C)=0.3$ and $n=3$ bits.• Explain modeling and coding. Explain how this will help to reduce entropy for following data. 9,11,11,11,14,13,15,17,16,17,20,21• Draw the flowchart of Encoding procedure of Huffman coding and explain with example• Encode “aacdeaab” using Adaptive Huffman code. Derive Output string, Codes and final tree. |
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