



► Pre-course Materials

► Topic 1: Course Overview

▼ Topic 2: Lossless Source Coding: Hamming Codes

2.1 Source Coding

Week 1 Quiz due Nov 02, 2015 at 15:30 UTC

2.2 Sequence of Yes/No Questions

Week 1 Quiz due Nov 02, 2015 at 15:30 UTC

2.3 Entropy of a Bit

Week 1 Quiz due Nov 02, 2015 at 15:30 UTC

2.4 Entropy of a Discrete Random Variable

Week 1 Quiz due Nov 02, 2015 at 15:30 UTC

2.5 Average Code Length

Week 1 Quiz due Nov 02, 2015 at 15:30 UTC

2.6 Huffman Code

Week 1 Quiz due Nov 02, 2015 at 15:30 UTC

2.7 Lab 1 - Source Coding

Lab due Nov 02, 2015 at 15:30 UTC

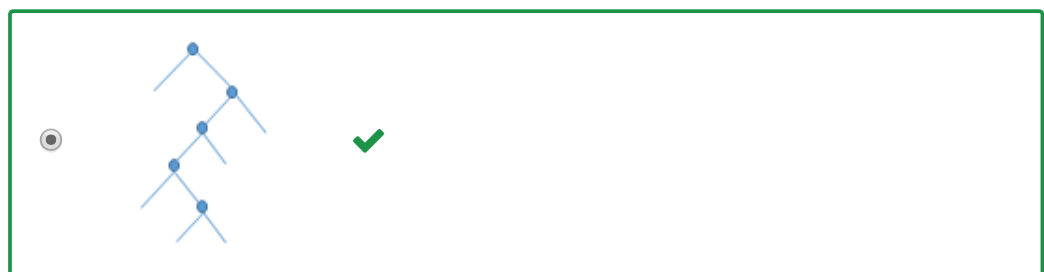
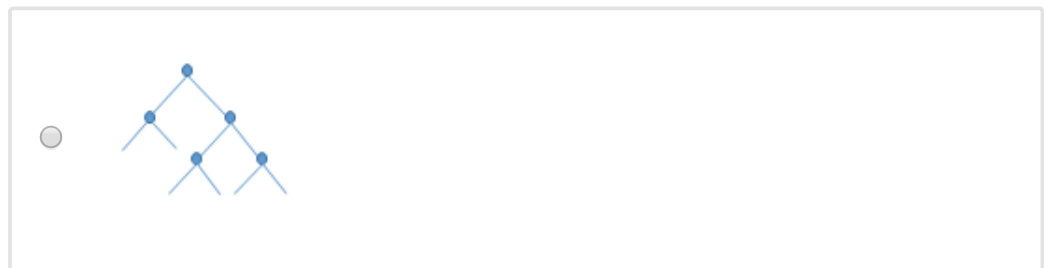
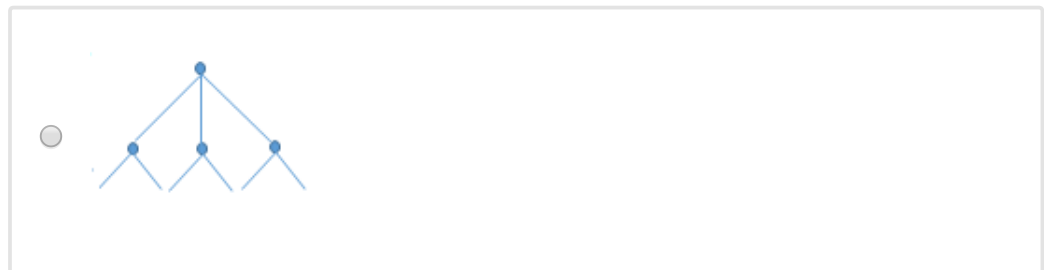
► MATLAB download and

## 2.6 QUIZ QUESTION 1 (1/1 point)

Suppose that we wish to use the Huffman code to encode the following six symbols with the following probabilities.

Symbol	Probability
A	0.04
B	0.1
C	0.25
D	0.15
E	0.40
F	0.06

Which of the following trees is the binary tree corresponding to the Huffman encoding?



**EXPLANATION**

Step 1:  $S = \{(A,0.04),(B,0.1),(C,0.25),(D,0.15),(E,0.4),(F,0.06)\}$

Step 2: Combine A and F to [AF],  $S = \{([AF],0.1),(B,0.1),(C,0.25),(D,0.15),(E,0.4)\}$

Step 3: Combine B and [AF] to [B[AF]],  $S = \{([B[AF]],0.2),(C,0.25),(D,0.15),(E,0.4)\}$

Step 4: Combine [B[AF]] and D to [[B[AF]D]],  $S = \{([[[B[AF]D]],0.35),(C,0.25),(E,0.4)\}$

Step 5: Combine [[B[AF]D]] and C to [[[B[AF]D]C]],  $S = \{([[[[B[AF]D]C]],0.6),(E,0.4)\}$

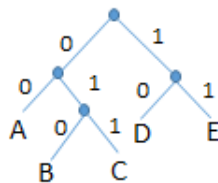
Step 6: Combine E and [[[B[AF]D]C]] to [E[[[B[AF]D]C]]],  $S = \{([E[[[B[AF]D]C]]],1)\}$

Only one symbol left in S, done!

*You have used 1 of 2 submissions*

**2.6 QUIZ QUESTION 2** (1/1 point)

Consider the following binary tree, corresponding to a Huffman encoding of five symbols.



Suppose that we receive the following bit stream, which was encoded using the Huffman encoding tree above.

Bitstream: 011000100101110

What was the corresponding symbol stream?

CABBED

✓ Answer: CABBED

**EXPLANATION**

Start from the beginning of the bitstream and the top of the tree, and follow the branches of the tree according to the bits in the bitstream. Once you end up at a symbol, record the symbol and then go back to the start of the tree.

Bitstream:           011000100101110  
                          [011][00][010][010][11][10]  
                          CABBED

*You have used 1 of 3 submissions*

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