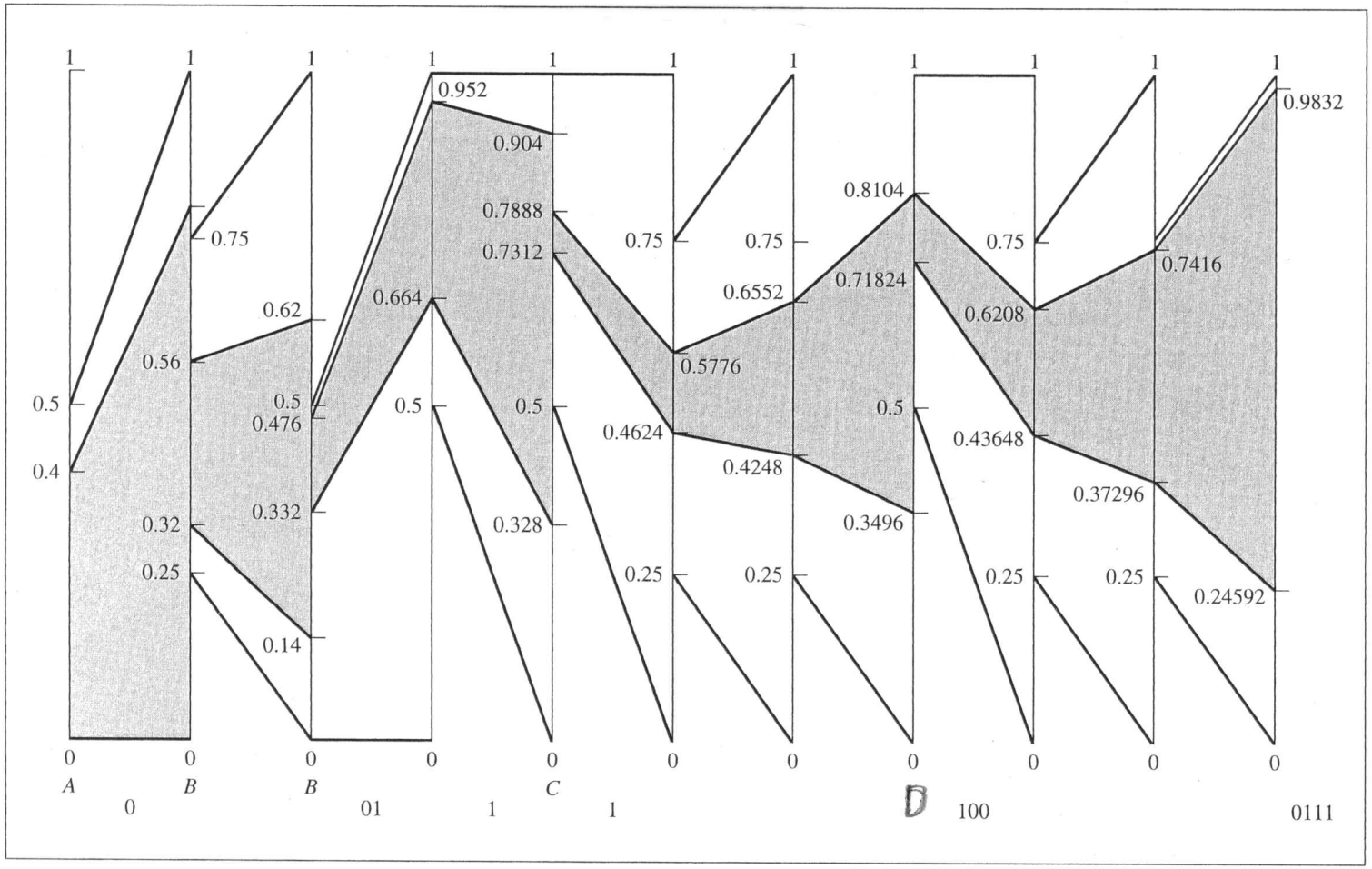
$P(A,B,C,D) = \{.4, .3, .1, .2\}$


1
0.952
0.9832
0.904
0.8104
0.7888
0.75
0.7312
0.75
0.75
0.75
0.7416
0.664
0.6552
0.71824
0.62
0.6208
0.56
0.5776
0.5
0.5
0.5
0.5
0.476
0.4624
0.43648
0.4
0.4248
0.37296
0.332
0.3496
0.32
0.328
0.25
0.25
0.25
0.25
0.24592
0.14
0
A
B
B
C
D
0
01
1
1
100
0111

P(A,B,C,D) = {.4, .3, .1, .2}

current-Interval	input letter	output bit	subintervals			
[0, 1)	*A*		[0, .4)	[.4, .7)	[.7, .8)	[.8, 1)
[0, .4)		0				
[0, .8)	*B*		[0, .32)	[.32, .56)	[.56, .64)	[.64, .8)
[.32, .56)		—				
[.14, .62)	*B*		[.14, .332)	[.332, .476)	[.476, .524)	[.524, .62)
[.332, .476)		01				
[.664, .952)		1				
[.328, .904)	*C*		[.328, .5584)	[.5584, .7312)	[.7312, .7888)	[.7888, .904)
[.7312, .7888)		1				
[.4624, .5776)		—				
[.4248, .6552)		—				
[.3496, .8104)	D		[.3496, .53392)	[.53392, .67216)	[.67216, .71824)	[.71824, .8104)
[.71824, .8104)		100				
[.43648, .6208)		—				
[.37296, .7416)		—				
[.24592, .9832)		0111				

Applying modified arithmetic coding to the message *ABBC* D

current-Interval	bitBuffer	input bits	bitBuffer in decimal		chosen subinterval	output letter
[0, 1)	001111	000111	.234375		[0, .4)	*A*
[0, .4)	001111	000111	.234375			
[0, .8)	011110	00111	.45875		[.32, .56)	*B*
[.32, .56)	011110	00111	.45875			
[.14, .62)	011100	0111	.4375	(–.25)	[.332, .476)	*B*
[.332, .476)	011100	0111	.4375			
[.664, .952)	111000	111	.8750			
[.328, .904)	110001	11	.765625	(–.5)	[.7312, .7888)	*C*
[.7312, .7888)	110001	11	.765625			
[.4624, .5776)	100011	1	.546875	(–.5)		
[.4248, .6552)	100111		.609475	(–.25)		
[.3496, .8104)	101110		.71875	(–.25)	[.71824, .8104)	D
[.71824, .8104)	011100		.21875	(–.5)		
[.43648, .6208)	011000		.375	(–.25)		
[.37296, .7416)	010000		.25	(–.25)		
[.24592, .9832)						

decode the codeword 001111000111

$P(A,B,C,D) = \{.4, .3, .1, .2\}$

current-Interval	length	input letter	subintervals			
[0, 1)	1	*A*	[0, .4)	[.4, .7)	[.7, .8)	[.8, 1)
[0, .4)	$.4 = p_1$	*B*	[0, .16)	[.16, .28)	[.28, .32)	[.32, .4)
[.16, .28)	$.12 = p_1p_2$	*B*	[.16, .208)	[.208, .244)	[.244, .256)	[.256, .28)
[.208, .244)	$.036 = p_1p_2p_2$	*C*	[.208, .2224)	[.2224, .2332)	[.2332, .2368)	[.2368, .242)
[.2332, .2368)	$.0036 = p_1p_2p_2p_3$	D	[.2332, .23464)	[.23464, .23572)	[.23572, .23608)	[.23608, .2368)
[.23608, .2368)	$.00072 = p_1p_2p_2p_3p_4$					

Summary of the divisions of currentInterval during arithmetic coding of the message *ABBCD*

current-Interval	subintervals				ouput letter
[0, 1)	[0, .4)	[.4, .7)	[.7, .8)	[.8, 1)	*A*
[0, .4)	[0, .16)	[.16, .28)	[.28, .32)	[.32, .4)	*B*
[.16, .28)	[.16, .208)	[.208, .244)	[.244, .256)	[.256, .28)	*B*
[.208, .244)	[.208, .2224)	[.2224, .2332)	[.2332, .2368)	[.2368, .242)	*C*
[.2332, .2368)	[.2332, .23464)	[.23464, .23572)	[.23572, .23608)	[.23608, .2368)	D

Decoding the codeword .23608