Exercicio 11

b) $p_{N_1}(n_1) = \binom{N}{n_1} p^{N_1} (1-p)^{N-n_1}$ Distribuição Binomial

$p = 1/2$: cada partícula tem probabilidade $1/2$ de se encontrar numa dada caixa

$$p_{N_1}(n_1) = \frac{N!}{(N-n_1)!\, n_1!} \left(\frac{1}{2}\right)^N$$

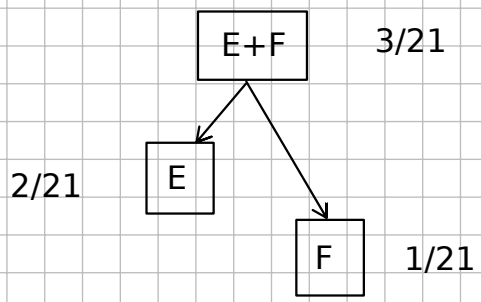
Exercicio 16

a) AAAAAABBBBBCCCCDDDEEF

N(A)=6; N(B)=5; N(C)=4; N(D)=3; N(E)=2; N(F)=1
Ncaracteres=21;

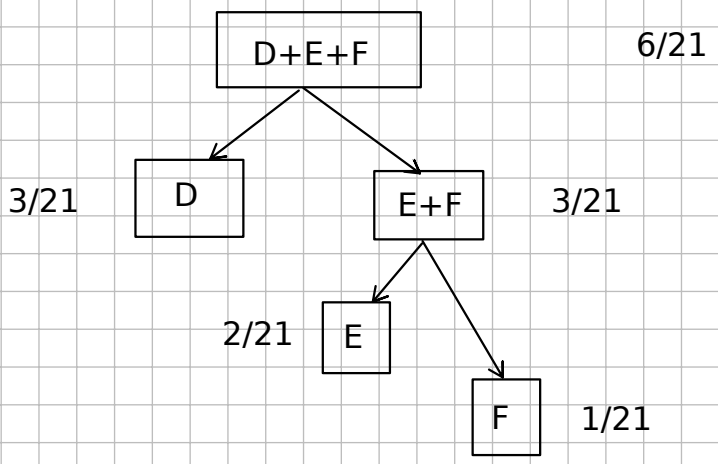
p(A)=6/21; p(B)=5/21; p(C)=4/21; p(D)=3/21; p(E)=2/21; p(F)=1/21
Alfabelto= X = {A,B,C,D,E,F}

1º passo



Alfabeto= X = {A,B,C,D,E+F}

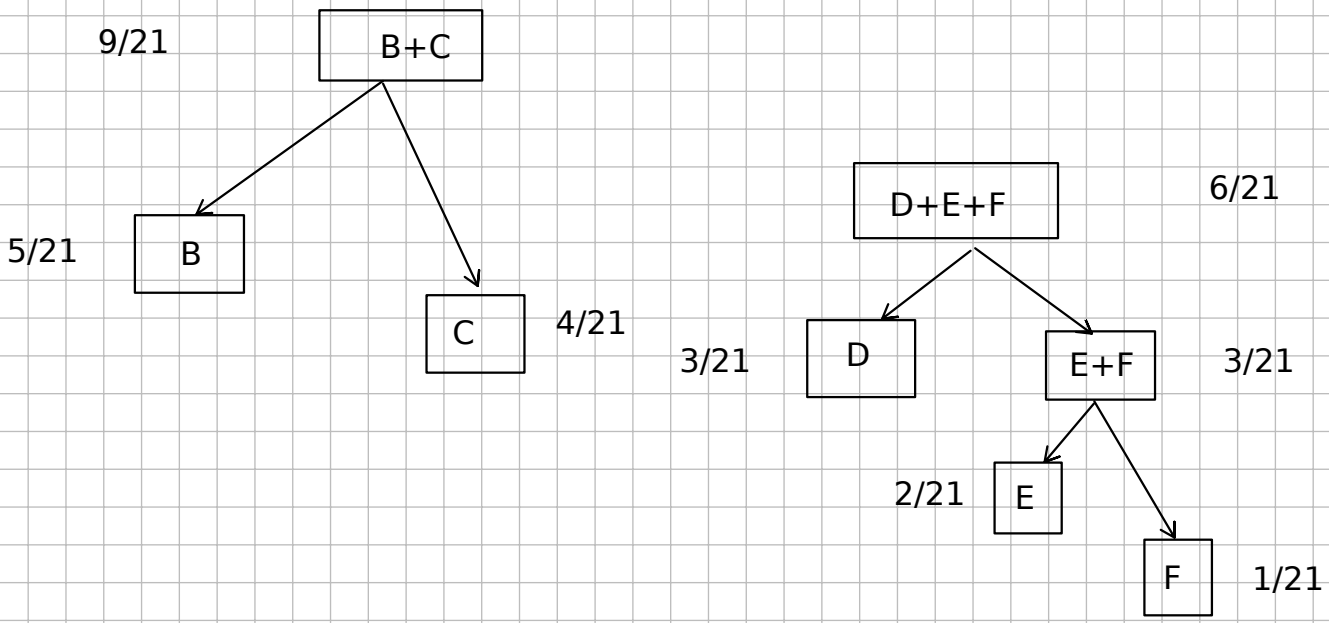
2º passo



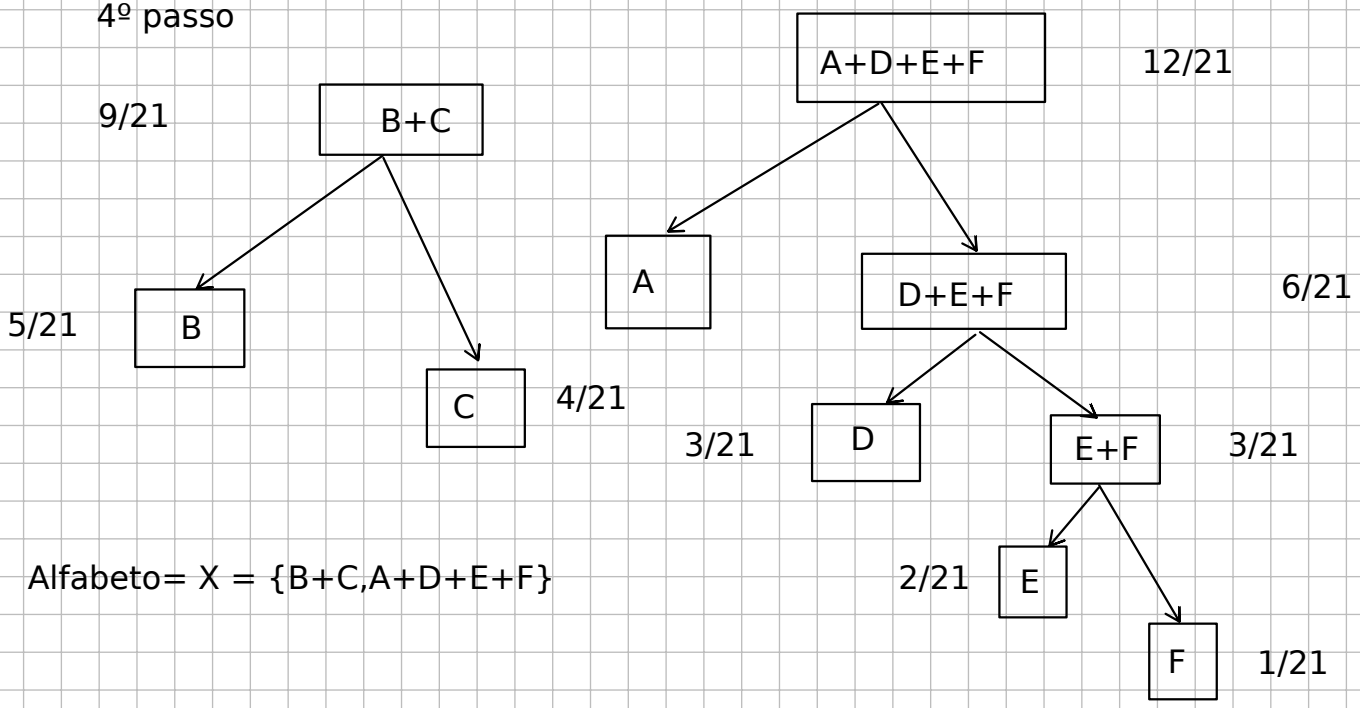
Alfabeto= X = {A,B,C,D+E+F}

3º passo

Alfabeto= X = {A,B+C,D+E+F}

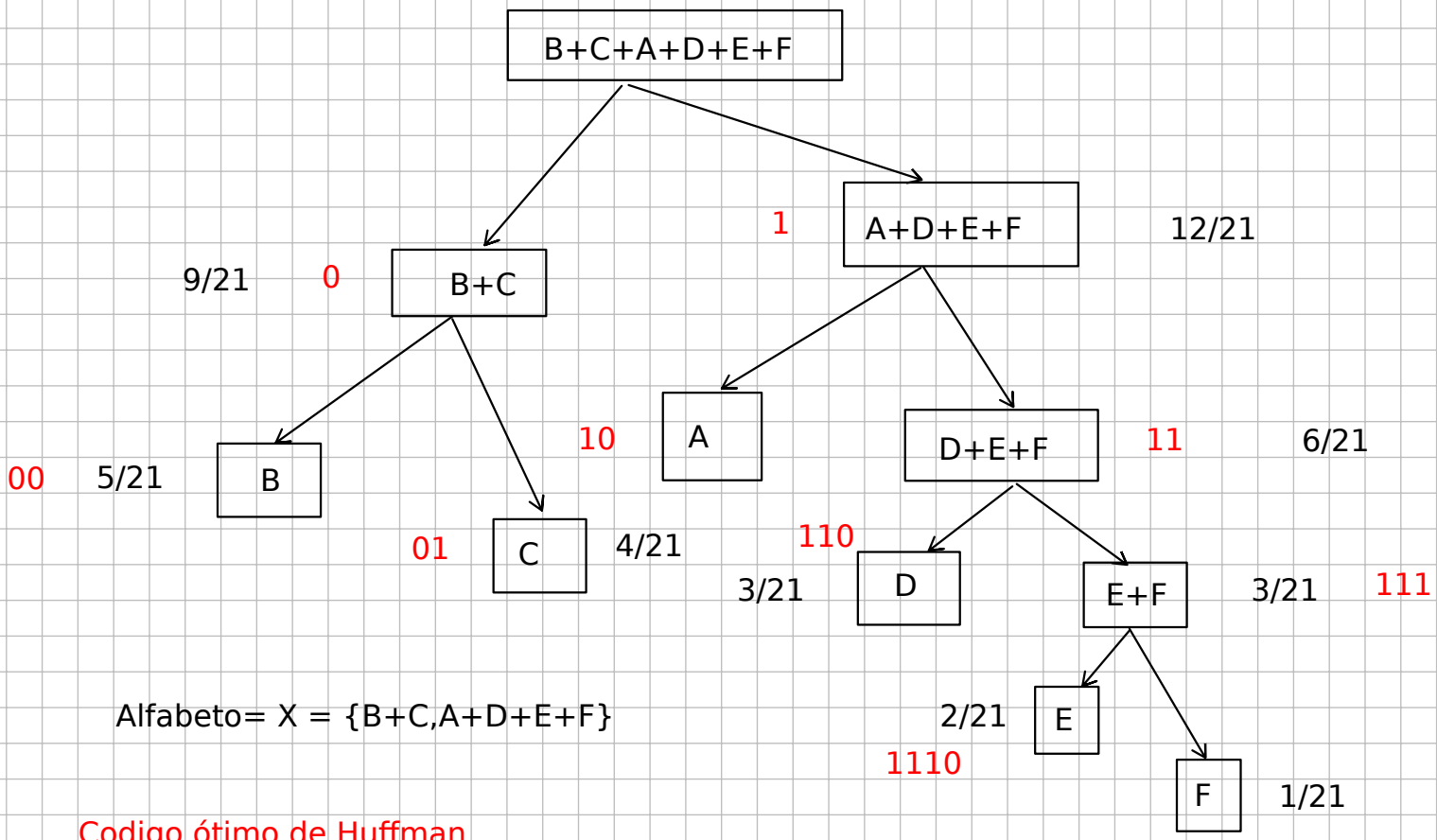


4º passo



Alfabeto= X = {B+C,A+D+E+F}

5º passo



Alfabeto= X = {B+C,A+D+E+F}

Codigo ótimo de Huffman

lw

2 A =10

2 B=00

2 C=01

3 D=110

4 E=1110

5 F=1111

texto comprimido

10101010101000000000000101010111011011011101111011101111

S=-6/21*log(6/21)-5/21*log(5/21)-4/21*log(4/21)-3/21*log(3/21)
-2/21*log(2/21)-1/21*log(1/21)=2.4 bits

Lotimo=2*6/21+2*5/21+2*4/21+3*3/21+4*2/21+5*1/21=2,43 bits

S<= Lotimo <=S+1 Teorema da compressão ótima