

Exercicio 11

Distribuição Binomial

$$p(n_1) = \binom{N}{n_1} p^{n_1} (1-p)^{N-n_1}$$

Caso particular $p = 1/2$

$$p(n_1) = \frac{N!}{(N-n_1)! n_1!} \left(\frac{1}{2}\right)^{n_1 + N-n_1}$$

Exercicio 16

caracter em codigo ascii ocupa 1 byte em memoria

mensagem: AAAAAABBBBBBCCCCDDDEEF

21 bytes=168 bits

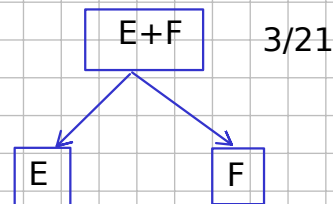
5 caracteres diferentes Ncaracteres=21;

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

$p(A)=6/21$; $p(B)=5/21$; $p(C)=4/21$; $p(D)=3/21$; $p(E)=2/21$; $p(F)=1/21$;

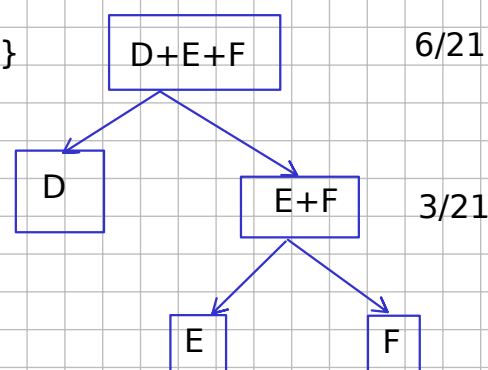
1º passo

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



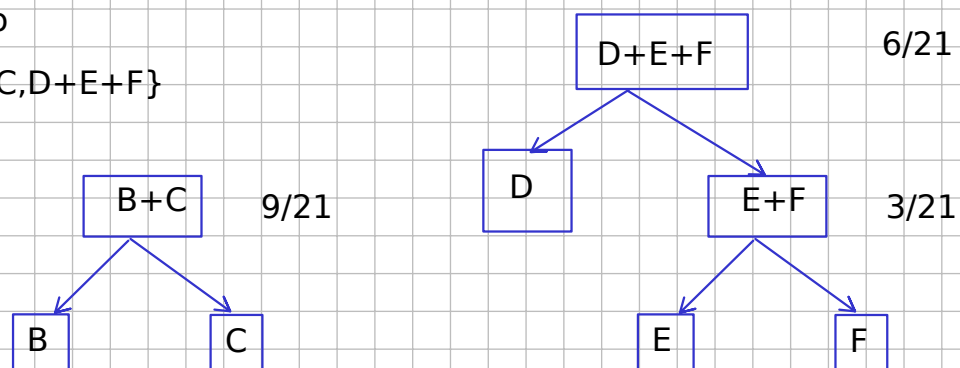
2º passo

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



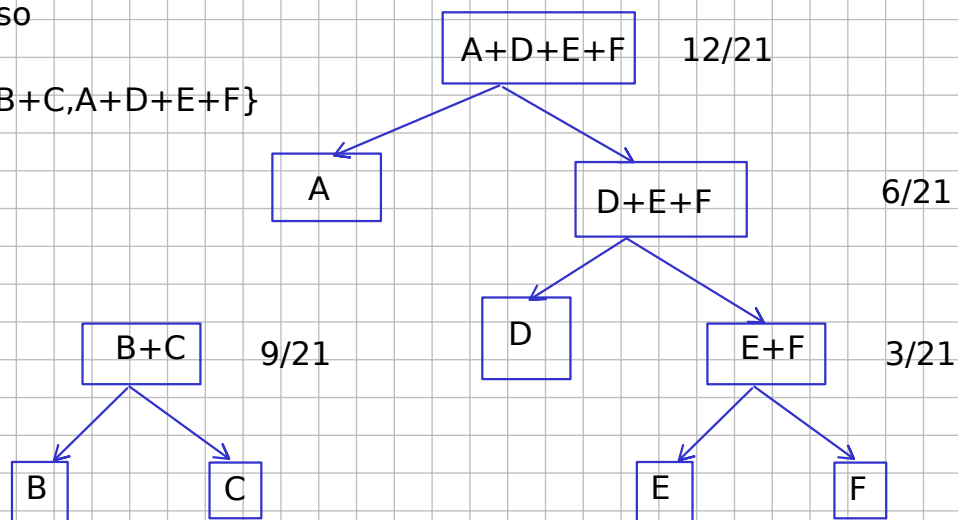
3º passo

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



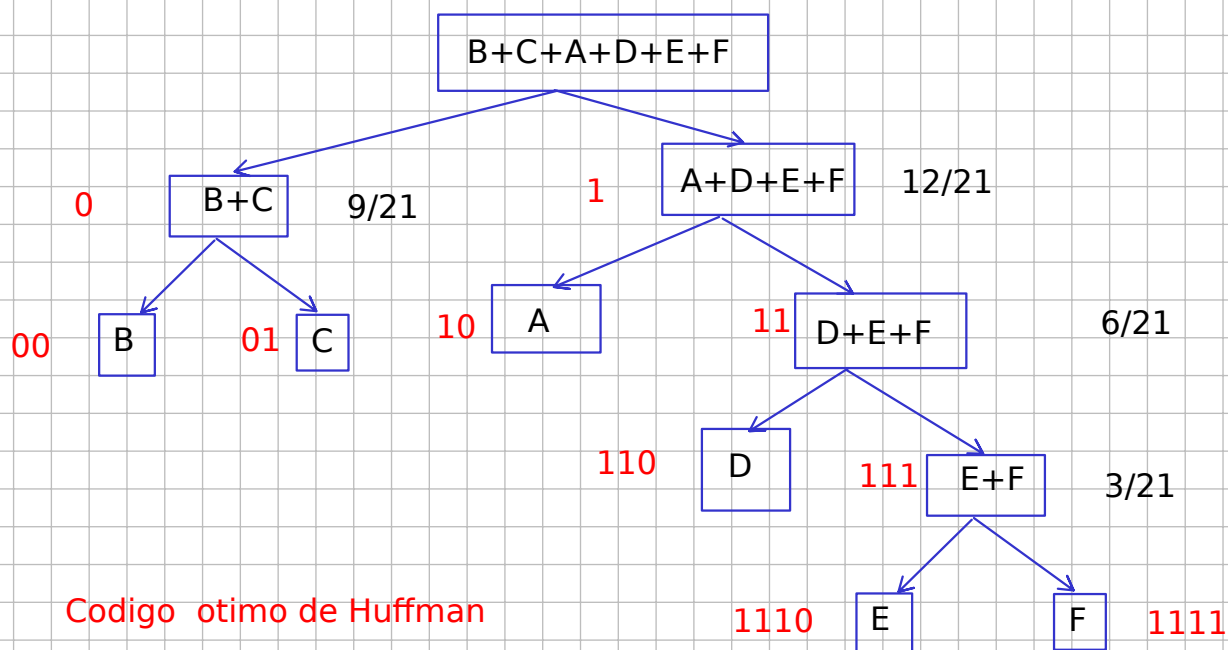
4º passo

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



5º passo

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



Código ótimo de Huffman

A=10

B=00

C=01

D=110

E=1110

F=1111

Nº de bits = 12 + 10 + 8 + 9 + 8 + 4 = 61 bits

mensagem codificada = 10101010101000000000001010101110110110111011101111