Лабораторная работа № 3

Дискретная математика для программистов – для студентов 2 курса

Тема: Методы кодирования

Удод Алексей 3ПМ

Вариант 40

|  |  |
| --- | --- |
| l: | 01101100 |
| o: | 01101111 |
| c: | 01100011 |
| a: | 01100001 |
| t: | 01110100 |
| i: | 01101001 |
| o: | 01101111 |
| n: | 01101110 |

32-блок: 01101100 01101111 01100011 01100001

a)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X1 | X2 | 0 | X4 | 1 | 1 | 0 | X8 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | X  16 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | X32 | 1 | 0 | 0 | 0 | 0 | 1 |
| x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  |
|  | x | x |  |  | x | x |  |  | x | x |  |  | x | x |  |  | x | x |  |  | x | x |  |  | x | x |  |  | x | x |  |  | x | x |  | x | x |
|  |  |  | x | x | x | x |  |  |  |  | x | x | x | x |  |  |  |  | x | x | x | x |  |  |  |  | x | x | x | x |  |  |  |  | x | x | x |
|  |  |  |  |  |  |  | x | x | x | x | x | x | x | x |  |  |  |  |  |  |  |  | x | x | x | x | x | x | x | x |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x | x | x | x | x | x | x |

→ Сообщение будет иметь вид: 01011110010001110100101101111010101100

Теперь рассмотрим блок: 01110100 01101001 01101111 01101110

b)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X1 | X2 | 0 | X4 | 1 | 1 | 1 | X8 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | X  16 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | X32 | 1 | 0 | 1 | 1 | 0 | 0 |
| x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  | x |  |
|  | x | x |  |  | x | x |  |  | x | x |  |  | x | x |  |  | x | x |  |  | x | x |  |  | x | x |  |  | x | x |  |  | x | x |  | x | x |
|  |  |  | x | x | x | x |  |  |  |  | x | x | x | x |  |  |  |  | x | x | x | x |  |  |  |  | x | x | x | x |  |  |  |  | x | x | x |
|  |  |  |  |  |  |  | x | x | x | x | x | x | x | x |  |  |  |  |  |  |  |  | x | x | x | x | x | x | x | x |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x | x | x | x | x | x | x |

→ Сообщение будет иметь вид: 01011111010001110100101101111011101100

Пусть в 1 блоке в 7-ом бите случилась ошибка, т.е.

01011100010001110100101101111010101100

00111 → ошибка в 7-ом бите

Пусть в 2-ом блоке в 17 бите случилась ошибка, т.е.

01011111010001110000101101111011101100

10001→ ошибка в 17-ом бите

№3

Строка для сжатия aaaaaaaaaaaaadghtttttttttttyiklooooooop(13 1 1 1 11 1 1 1 1 7 1)

13a03dgh11t04yikl7o01p

(22/39)\*100=56.5%

№4

В(110)А(20)П(25)Р(45)О(45)Л(5)Д(130)Ж(25)Э(160)Я(135)

В(110)АЛ(25)П(25)Р(45)О(45) Д(130)Ж(25)Э(160)Я(135)

В(110)АЛП(50) Р(45)О(45) Д(130)Ж(25)Э(160)Я(135)

В(110)АЛП(50) РЖ(70)О(45) Д(130)Э(160)Я(135)

В(110)АЛПО(95) РЖ(70) Д(130)Э(160)Я(135)

В(110)АЛПОРЖ(165)Д(130)Э(160)Я(135)

ВД(240)АЛПОРЖ(165) Э(160)Я(135)

ВД(240)АЛПОРЖ(165) Э(160)Я(135)

ВД(240)АЛПОРЖ(165) ЭЯ(295)

ВДАЛПОРЖ(405) ЭЯ(295)

ВДАЛПОРЖЭЯ(705)

ВДАЛПОРЖ(1) ЭЯ(0)

ВД(11)АЛПОРЖ(10) ЭЯ(0)

ВД(11)АЛПОРЖ(10) Э(01)Я(00)

В(110)АЛПОРЖ(10)Д(111)Э(01)Я(00)

В(110)АЛПО(101) РЖ(100) Д(111)Э(01)Я(00)

В(110)АЛП(1011) РЖ(100)О(1010) Д(111)Э(01)Я(00)

В(110)АЛП(1011) Р(1001)О(1010) Д(111)Ж(1000) Э(01)Я(00)

В(110)АЛ(10111)П(10110) Р(1001)О(1010) Д(111)Ж(1000) Э(01)Я(00)

В(110)А(101111)П(10110) Р(1001)О(1010) Л(101110) Д(111)Ж(1000) Э(01)Я(00)

№5

a(0,10); b(0,10); c(0,05); d(0,55); e(0,10); f(0,10).  
d [0;0,55]

a [0,55;0,65]

b [0,65;0,75]

e [0,75;0,85]

f [0,85;0,95]

c [0,95;1]  
aecdfb  
a[0,55;0,65]

e[0,625;0,635]

c[0,6345;0,635]

d[0,6345;0,634775]

f[0,63473375;0,63476125]

b[0,634751625;0634754375]

Предположим, что результатом кодирования была выбрана левая граница полуинтервала, т.е. число 0,634751625.

№2

1)Ч -0000

Ш - 0110

Щ - 0011

Ь - 0101

Ъ – 1100

Э – 1001

Ю - 1010

Я – 1111

2) Ч -000000000

Ш - 000000111

Щ - 000011001

Ь - 011100010

Ъ – 000101010

Э – 001010110

Ю - 001101101

Я – 111110110