

- (2) 169: $169-90 = 79$ and $169-65=104$ – this says the code number is greater than or equal to 79
- (3) 146: $146-90=56$ and $146-65=81$ – this says the code number is less than or equal to 81
- (4) 167: $167-90=77$ and $167-65=102$ – this says the code number is greater than or equal to 77
- (5) 145-90=55 and $145-65=80$ – this says the code number is less than or equal to 80

So from this information we gather by putting (2) and (5) together that the code number used to encrypt column 8 is between 79 and 80 which correspond to the letters o and p.

You will note that we need not look at all the numbers in the column, the tightest bounds will come from looking at the largest and smallest number in the column.

Here's the analysis for column 9:

The largest number is 169 and the smallest is 154:

- (1) 169: $169-90 = 79$ and $169-65 = 104$
- (2) 154: $154-90=64$ and $154-65=89$

Putting these together we see that the code number used to encrypt column 9 is between 79 and 89 which correspond to the letters o – y.

If you repeat this analysis for each column you get the following information where an x indicates that that number is a possible code number for the column:

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
65	A							x							x							x	
66	B							x							x						x	x	x
67	C						x	x							x						x	x	x
68	D						x	x							x						x	x	x
69	E						x	x	x					x	x	x					x	x	x
70	F					x	x	x	x					x		x					x	x	x
71	G					x	x	x	x					x		x					x		
72	H					x		x	x					x		x					x		
73	I					x			x				x	x		x					x		
74	J					x			x				x			x					x		
75	K					x			x				x			x					x		
76	L					x			x				x			x					x		
77	M					x			x				x			x					x		
78	N					x			x				x			x					x		
79	O	x	x			x			x	x			x			x							
80	P	x	x			x			x	x			x			x							
81	Q		x							x			x				x						
82	R		x							x			x				x						
83	S		x							x			x				x						
84	T		x	x	x					x	x	x					x	x					
85	U		x	x	x					x	x	x					x	x	x				
86	V		x	x	x						x	x					x	x	x				
87	W		x	x	x						x	x								x	x		
88	X		x	x	x						x	x								x	x		
89	Y		x	x	x						x	x								x	x		
90	Z			x	x						x	x								x	x		

It appears that code numbers 3 and 4 might repeat at 10 and 11 and again at 17 and 18. Since these numbers differ by 7, this suggests the codeword is 7 letters long. Working on that assumption we get that columns 1, 8, and 15 were encrypted with the same code number. Likewise 2, 9 and 16 were encrypted with the same code number, etc. Putting the information from the columns together we can eliminate more possibilities and get the following choices for each letter in the code word.

1	2	3	4	5	6	7
O	Q	T	U	I	E	B
P	R	U	V	J	F	C
	S	V	W	K		D
	T	W	X	L		E
	U	X	Y	M		
		Y	Z	N		
		Z				

The next step is to find the codeword. After some guess and checking one will find the code word to be "PUZZLED". In ASCII, P=80, U= 85, Z = 90, Z=90, L = 76, E = 69, D=68. So now we need to subtract this from the ciphertext then translate back to letters using the ASCII table.

Cipher	148	154	155	172	145	152	152	157	154	159	174
Code	80	85	90	90	76	69	68	80	85	90	90
Plain	68	69	65	82	69	83	84	77	69	69	84
Letters	D	E	A	R	E	S	T	M	E	E	T
	160	148	145	159	167	172	169	163			
	76	69	68	80	85	90	90	76			
	84	79	77	79	82	82	79	87			

T O M O R R O W

Cipher	148	154	155	172	145	152	152	169	154	173	173	149	157	148	157	150	174
Code	80	85	90	90	76	69	68	80	85	90	90	76	69	68	80	85	90
Plain	68	69	65	82	69	83	84	89	69	83	83	73	88	80	77	65	84
Letters	D	E	A	R	E	S	T	Y	E	S	S	I	X	P	M	A	T
	169	161	151	145	149	154	174	163	154	140	148	156	150	157	159		
	90	76	69	68	80	85	90	90	76	69	68	80	85	90	90		
	79	85	82	77	69	69	84	73	78	71	80	76	65	67	69		

O U R M E E T I N G P L A C E

Cipher	148	154	155	172	145	152	152	146	167	163	168	147	153	140	149	158	174
Code	80	85	90	90	76	69	68	80	85	90	90	76	69	68	80	85	90
Plain	68	69	65	82	69	83	84	66	82	73	78	71	84	72	69	73	84
Letters	D	E	A	R	E	S	T	B	R	I	N	G	T	H	E	I	T
Cipher	159	153	142	146	145	151	166	155	143	144	135	145	168	159			
Code	90	76	69	68	80	85	90	90	76	69	68	80	85	90			
Plain	69	77	73	78	65	66	76	65	67	75	67	65	83	69			

Letters	E	M	I	N	A	B	L	A	C	K	C	A	S	E			
Cipher	148	154	155	172	145	152	152	167	157	159	172	145	152	140	145	161	166
Code	80	85	90	90	76	69	68	80	85	90	90	76	69	68	80	85	90
Plain	68	69	65	82	69	83	84	87	72	69	82	69	83	72	65	76	76

Letters	D	E	A	R	E	S	T	W	H	E	R	E	S	H	A	L	L
Cipher	174	148	138	134	145	152	165	175	156	135	137						
Code	90	76	69	68	80	85	90	90	76	69	68						
Plain	84	72	69	66	65	67	75	85	80	66	69						

Letters T H E B A C K U P B E

Cipher	148	154	155	172	145	152	152	145	169	174	162	145	136	137	158	169	172
Code	80	85	90	90	76	69	68	80	85	90	90	76	69	68	80	85	90
Plain	68	69	65	82	69	83	84	65	84	84	72	69	67	69	78	84	82
Letters	D	E	A	R	E	S	T	A	T	T	H	E	C	E	N	T	R
Cipher	155	152	159	147	159	171	155	166	145	153	156						
Code	90	76	69	68	80	85	90	90	76	69	68						
Plain	65	76	90	79	79	86	65	76	69	84	88						
Letters	A	L	Z	O	O	V	A	L	E	T	X						

Message 1: Dearest Meet tomorrow

Message 2: Dearest Yes six pm at our meeting place

Message 3: Dearest Bring the item in a black case

Message 4: Dearest Where shall the back up be

Message 5: Dearest At the central zoo valet x