UseCaesarCipher(…) and ApplyShiftToASCIICodeForCharacter(…) Dry-Run Tasks

Function ApplyShiftToASCIICodeForCharacter(ByVal ASCIICode As Integer, ByVal AmountToShift As Integer) As Integer

Dim NewASCIICode As Integer

Dim TypeOfCharacter As String

TypeOfCharacter = GetTypeOfCharacter(ASCIICode)

If TypeOfCharacter <> "Other" Then

If TypeOfCharacter = "Upper" Then

NewASCIICode = ((26 + ASCIICode - Asc("A") + AmountToShift) Mod 26) + Asc("A")

Else

NewASCIICode = ((26 + ASCIICode - Asc("a") + AmountToShift) Mod 26) + Asc("a")

End If

Else

NewASCIICode = ASCIICode

End If

ApplyShiftToASCIICodeForCharacter = NewASCIICode

End Function

Get the type of character

If Character is not (A-Z or a-z) then no shift applied

If Character is upper then NewAsciiCode = ((AsciiCode-64+Shift) MOD 26)+64

If Character is lower then NewAsciiCode = ((AsciiCode-97+Shift) MOD 26)+97  
Return NewAsciiCode

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| BYE ZEBRA  If we simply added 10 to the numbers associated with letters   |  |  |  | | --- | --- | --- | | Orig | num | +10 | | B | 2 | 12 | | Y | 25 | 35 | | E | 5 | 15 | |  |  |  | | Z | 26 | 36 | | E | 5 | 15 | | B | 2 | 12 | | R | 18 | 28 | | A | 1 | 11 | |  |  |  |   We get some numbers that don’t make sense! There is no character 36! | BYE ZEBRA  Simply adding 10 to the ascii   |  |  |  |  | | --- | --- | --- | --- | |  | Ascii | +10 |  | | B | 66 | 56 | 8 | | Y | 89 | 99 | c | | E | 69 | 79 | O | |  | 32 | 42 | \* | | Z | 90 | 100 | d | | E | 69 | 79 | O | | B | 66 | 76 | L | | R | 82 | 92 | \ | | A | 65 | 75 | K |   OK using ASCII we now have a character for every number. Still not right | But That’s NOT how the Caesar cipher works looking at the characters using ONLY numbers 1 to 26   |  |  |  |  | | --- | --- | --- | --- | | Orig | num | +10 | new | | B | 2 | 12 | L | | Y | 25 | 9 | I | | E | 5 | 15 | O | |  |  |  |  | | Z | 26 | 10 | J | | E | 5 | 15 | O | | B | 2 | 12 | L | | R | 18 | 2 | B | | A | 1 | 11 | K | |  |  |  |  |   Looping round so 26+1 =1 etc.. is the right idea | So using the Ascii codes A-Z is the range 65-90   |  |  |  |  | | --- | --- | --- | --- | | Orig | num | +10 | new | | B | 2 | 12 | L | | Y | 25 | 9 | I | | E | 5 | 15 | O | |  |  |  |  | | Z | 26 | 10 | J | | E | 5 | 15 | O | | B | 2 | 12 | L | | R | 18 | 2 | B | | A | 1 | 11 | K | |  |  |  |  |   Mathematically only using the numbers 1 to 26 seems hard at first. Until we remember the trusty MOD operator ☺ |

The MOD operator returns the remainder of any division:

|  |  |  |  |
| --- | --- | --- | --- |
| 1. 10 MOD 3 = | 1 | 1. 9 MOD 3 | 0 |
| 1. 11 MOD 3 = | 2 | 1. 17 MOD 6 | 5 |
| 1. 19 MOD 5 = | 4 | 1. 78 MOD 26 | 0 |
| 1. 60 MOD 26 = | 8 | 1. 75 MOD 26 | 23 |

Right let’s think about how do we mathematically shift the number 26 to become 1 (Z shifting 1 to become A)

26 + 1 = 27

27 MOD 26 = 1 (27/26 = 1r1) (WOW THAT WAS EASY!!!)

Lets do Y shifting 9 to become H (25 shifting 9 to become 8)

25 + 9 = 34

34 MOD 26 = 8 (34/26 = 1r8) (looks like it works ☺)

Unfortunately the asciicodes for A-Z are 65🡪90, but If we subtract 64 from any A->Z ascii code we will end up with 1->26

Lets do Z shifting 1 to become A (90 + 1 = 65)

90-64 = 26

26+1 =27

27 MOD 26 = 1

1 + 64 =65 (the character code for an A)

NewAsciiCode = (((AsciiCode – 64) + AmountToShift) MOD 26)+64

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Else

NewASCIICode = ((26 + ASCIICode - Asc("a") + AmountToShift) Mod 26) + Asc("a")

End If

Else

NewASCIICode = ASCIICode

End If

ApplyShiftToASCIICodeForCharacter = NewASCIICode

End Function

Function UseCaesarCipher(ByVal OriginalText As String, ByVal AmountToShift As Integer) As String

Dim ChangedText As String

Dim Count As Integer

Dim ASCIICode As Integer

ChangedText = ""

For Count = 0 To OriginalText.Length - 1

ASCIICode = Asc(OriginalText(Count))

ASCIICode = ApplyShiftToASCIICodeForCharacter(ASCIICode, AmountToShift)

ChangedText = ChangedText & Chr(ASCIICode)

Next

UseCaesarCipher = ChangedText

End Function

OriginalText = “XRAY”

AmountToShift = 15

OriginalText.Length = \_\_\_

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Count | OriginalText(Count)) | AsciiCode | Chr(ASCIICode) | ChangedText |
| 0 |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| 1 |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| 2 |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| 3 |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |