Homework 13th January 2016

1. Easy.

Print a table of the ASCII character set just like this one:-

32 33 ! 34 " 35 # 36 $ 37 % 38 & 39 ' 40 ( 41 )

42 \* 43 + 44 , 45 - 46 . 47 / 48 0 49 1 50 2 51 3

52 4 53 5 54 6 55 7 56 8 57 9 58 : 59 ; 60 < 61 =

62 > 63 ? 64 @ 65 A 66 B 67 C 68 D 69 E 70 F 71 G

72 H 73 I 74 J 75 K 76 L 77 M 78 N 79 O 80 P 81 Q

82 R 83 S 84 T 85 U 86 V 87 W 88 X 89 Y 90 Z 91 [

92 \ 93 ] 94 ^ 95 \_ 96 ` 97 a 98 b 99 c 100 d 101 e

102 f 103 g 104 h 105 i 106 j 107 k 108 l 109 m 110 n 111 o

112 p 113 q 114 r 115 s 116 t 117 u 118 v 119 w 120 x 121 y

122 z 123 { 124 | 125 } 126 ~ 127 

Notes:- use %3d in the printf() statement, to print the number using a field-width of three.

You might put a tab “\t” between the columns, but spaces should do.

Only print characters 32 to 127.

1. Hard.

There is a simple way of encrypting a message (a cypher) called ROT13, or Caesar’s Cypher. To do it, you take each letter of the message and “add” 13 to it, so A turns into N. B turns into O, C into P , until M which turns into Z. Using ASCII codes, this is easy to do.

65 A ---> 78 N

66 B ---> 79 O

67 C ---> 80 P

68 D ---> 81 Q

69 E ---> 82 R

70 F ---> 83 S

71 G ---> 84 T

72 H ---> 85 U

73 I ---> 86 V

74 J ---> 87 W

75 K ---> 88 X

76 L ---> 89 Y

77 M ---> 90 Z

To encipher the letters N to Z, the alphabet is wrapped around. N would turn into A:-

78 N ---> 65 A

79 O ---> 66 B

80 P ---> 67 C

81 Q ---> 68 D

82 R ---> 69 E

83 S ---> 70 F

84 T ---> 71 G

85 U ---> 72 H

86 V ---> 73 I

87 W ---> 74 J

88 X ---> 75 K

89 Y ---> 76 L

90 Z ---> 77 M

Write a function like this :-

char encodeROT13(char inputCharacter) {

return <something>

}

That will perform this cipher.

Check that it works by calling it twice like this :-

encodeROT13(encodeROT13(‘A’));

and

encodeROT13(encodeROT13(‘N’));

In these cases, the original letter, A and N, should be returned.

Show that it works by calling it on each of the letters in the phrase “HELLOWORLD” and printing the results :-

printf encodeROT13(‘H’));

printf encodeROT13(‘E’));

etc…