The University of Jordan
Faculty of Engineering and Technology
Department of Computer Engineering

Object-Oriented Problem Solving: CPE 342

Write the following Java programs:

1. A program that declares an integer variable and reads its value from the console. The program must then round the number according to a second integer value entered by the user. The second integer must be a **power** of 10, such that it specifies the nearest number the first integer must be rounded to. Yor program must work as follows:

   a. The program must prompt the user to enter the integer to be rounded and read the integer from the user.

   b. The program must prompt the user to enter the nearest **power** of ten he wants to round the number to, and operate accordingly as follows:

      i. If the second entered integer is not a **power** of ten, the program must print the error message: "Sorry, this integer must be a **power** of ten" and exit.

      ii. If the second entered integer is greater than the first integer (e.g., the first integer is 3827 and the second integer is 10000), the program must print the following message: "Sorry, second integer must be less than the first integer" and exit.

      iii. If the second integer is a **power** of ten and is less than the first integer, the program must round the first integer to the nearest **power** of ten specified in the second integer and print the following message:
      first_integer " rounded to the nearest " second_integer " is " ……
      For example, if the first integer is 18732 and the second integer is 1000, the program must print the statement:
      18732 rounded to the nearest 1000 is 19000

Note: Except for *System.out.println*, you are NOT ALLOWED to use methods from the Java API (library) for solving this question.

2. A program that declares two characters and reads their values from the user. The characters must represent two uppercase letters such that the first letter is alphabetically before the second. The program must print a table that contains letters in the range between the two entered letters, repeated from 1 to n, where n is an integer read from the user, as follows:

   a. The program must check that the first and second characters are uppercase letters. If either of these characters is not an uppercase letter, it must print the message: "Wrong input: both characters must be uppercase letters!".
   b. The program must check that the first letter is alphabetically before the second letter. If not, it must print the message: "Wrong input: first letter must be alphabetically before the second!".
   c. The program must check that the entered integer n is greater than 1 and less than 10. If not, it must print the message: "Wrong input: number of repetitions must be greater than 1 and less than 10".
   d. If the inputs are correct, the program must print a table whose rows represent the repetitions of the letters in the entered range from 1 to n.
      For example, if the user enters the characters C and G, and the number of repetitions n to be 5, the program must print the following table:

C	CC	CCC	CCCC	CCCCC	CCCCCC
D	DD	DDD	DDDD	DDDDD	DDDDDD
E	EE	EEE	EEEE	EEEEE	EEEEEE
F	FF	FFF	FFFF	FFFFF	FFFFFF
G	GG	GGG	GGGG	GGGGG	GGGGGG

Note-1: the width of all table cells must be 10, and values must be left justified.
Note-2: You are NOT ALLOWED to use methods from the Java API (library) for solving this question, except for printing methods and Scanner methods.