CENG113
Programming Basics
HOMEWORK #5

Write a python code by **NOT** using *for statement and any additional library*. Please adapt your code scenario given below.

- Get two inputs from user as a chain of nucleic acid that could be DNA or RNA.
  Example:
  input1= "CATTCG" (DNA)
  input2= "CAUUCG" (RNA)
- Be sure they are DNA, if there is RNA among them, convert it/ them to DNA.
  Example:
  Convert "CAUUCG" to "GTAAGC"
- Calculate similarity between them. And print the similarity result from standard output. Do not forget length of nucleic acids does not have to be the same.

Background Information:
- Deoxyribonucleic Acid (DNA) is double helix nucleic acid chain, but in this homework assume that it is single helix.
- Allowed nucleoside in DNA is Cytosine(C), Guanine (G), Adenine(A), Thymine(T)
- Ribonucleic Acid (RNA) is single helix nucleic acid chain.
- Allowed nucleoside in RNA is Cytosine(C), Guanine(G), Adenine(A), Uracil(U)

In this homework you are expected to write 3 functions. Your functions shouldn't be less or more than 3 functions. The functions jobs are given below.

Function #1: Your first function is responsible of checking nucleic acid chain DNA or not. This function gets nucleic acid chain as an argument and if it is RNA returns False, if it is DNA returns True.

Function #2: Your second function is responsible of converting RNA to DNA. Follow below rules when converting.
rna2dna converting rules: G → C
                              C → G
                              A → T
                              U → A
Example: If RNA that should be converted to DNA is "CAUUCG", function would create "GTAAGC".

Function #3: Your third function is responsible of measure the similarity between two DNAs. The **maximum similarity** is the result of given two DNAs.

$$similarity = \frac{number\ of\ common\ nucleic\ acid}{minimum\ length\ among\ length\ of\ DNA\,1,\ DNA\,2} * 100$$

Example: If first DNA is "CATTCG" and second DNA is "ACT" similarity will be **66.66**.
        *CAT*TCG ~ ACT   *33.33 ("xxT" is common)*
        *C*ATT*CG ~ ACT   **66.66** ("AxT" is common)*
        *CA*TT*CG ~ ACT   *0   ("xxx" is common)*
        *CAT*TCG* ~ ACT   *33.33 ("xCx" is common)*

Due Date:09.12.15, 23:55
Submission Rules:
1. You should submit your codes through CMS.
2. Your homework should be named as **HW5_StudentID.py**. Students who do NOT follow these rules **WILL BE GRADED AS 0.**
3. Use comments in your code, otherwise you will lose some points.
4. Write your Name, Surname and Student ID as a comment in your code.