Problem set 4: Dictionaries

1. Find if a particular key is present in the dictionary.
    Input:
    ```
    {'Name' : 'Ron', 'Age' : 22}
    Name
    ```
    Output:
    ```
    Yes
    ```

2. Print all keys in a dictionary.
    Input:
    ```
    {'Name' : 'Ron', 'Age' : 22}
    ```
    Output:
    ```
    Name
    Age
    ```

3. Print all values in a dictionary.
    Input:
    ```
    {'Name' : 'Ron', 'Age' : 22}
    ```
    Output:
    ```
    Ron
    22
    ```

4. Given a dictionary with different values. Print all the keys of the dictionary where the value is less than 5.
    Input:
    ```
    { 'A' : 5, 'H' : 7, 'K' : 2, 'I' : 0 }
    ```
    Output:
    ```
    K
    I
    ```

5. Find nucleotide frequencies.
    Input:
    ```
    AGCTTTTCATTCTGACTGCAACGGGCAATATGTCTCTGTGTGGATTAAAAAAAGAGTGTCTGATAGCAGC
    ```
    Output:
    ```
    A: 20, C: 12, G: 17, T: 21
    ```

6. Find which one of the bases(A/C/T/G) occurs the most in the above-mentioned sequence?
    Input:
    ```
    AGCTTTTCATTCTGACTGCAACGGGCAATATGTCTCTGTGTGGATTAAAAAAAGAGTGTCTGATAGCAGC
    ```
    Output:
    ```
    A
    ```

7. Find which one of the bases occur minimum number of times in a DNA sequence.
    Input:
    ```
    AGCTTTTCATTCTGACTGCAACGGGCAATATGTCTCTGTGTGGATTAAAAAAAGAGTGTCTGATAGCAGC
    ```
    Output:
    ```
    C
    ```

8. Given a dictionary D, find the sum of all the values in the dictionary
    Input:
    ```
    {'a' : 100, 'b' : 200, 'c' : 300}
    ```
    Output:
    ```
    600
    ```

9. Given an RNA sequence find its corresponding protein sequence. The 20 commonly occurring amino acids are abbreviated by using 20 letters from the English alphabet (all letters except for B, J, O, U, X, and Z). Protein strings are constructed from these 20 symbols. The RNA codon table dictates the details regarding the encoding of specific codons into the amino acid alphabet.
    Input:
    ```
    AUGGCCAUGGCGCCCAGAACUGAGAUCAAUAGUACCCGUAUUAACGGGUGA
    ```
    Output:
    ```
    MAMAPRTEINSTRING
    ```

10. Using the protein sequence obtained from the previous function, find its molecular weight. The mass of each amino acid is as follows.: 'A': 71.03711, 'G': 57.02146, 'M': 131.04049, 'S': 87.03203,'C': 103.00919, 'H': 137.05891, 'N': 114.04293, 'T': 101.04768,'D': 115.02694, 'I': 113.08406, 'P': 97.05276, 'V': 99.06841,'E': 129.04259, 'K': 128.09496, 'Q': 128.05858, 'W': 186.07931,'F': 147.06841, 'L': 113.08406, 'R': 156.10111, 'Y': 163.06333
    Input:
    ```
    MAMAPRTEINSTRING
    ```
    Output:
    ```
    1742.8556
    ```