Exercise set 1

1. Given a string that contains a representation of an DNA sequence, compute the AT content, i.e., the fraction of nucleotides that are either A or T.  
   ACTGATCGATTACGTATAGTATTTGCTATCATACATATATATCGATGCGTTCAT
2. Given a string representing a DNA sequence, compute its complement.  
   ACTGATCGATTACGTATAGTATTTGCTATCATACATATATATCGATGCGTTCAT
3. Given a string representing a DNA sequence that contains a recognition site for the EcoRI restriction enzyme, compute the lengths of the resulting fragments. The motif is `G\*AATTC` where `\*` indicates the position of the cut.  
   ACTGATCGATTACGTATAGTAGAATTCTATCATACATATATATCGATGCGTTCAT
4. The given DNA sequence contains to exons, separated by an intron. The first exon runs from the start of the sequence to 63rd character, while the second starts at the 91st and contains the remainder of the sequence. Print the coding region only. To make it easier to check, print a `\*` between the two exons.  
   ATCGATCGATCGATCGACTGACTAGTCATAGCTATGCATGTAGCTACTCGATCGATCGATCGAT'CGATCGATCGATCGATCGATCATGCTATCATCGATCGATATCGATGCATCGACTACTAT
5. Given the previous DNA sequence, compute the fraction of the DNA that is coding.
6. Given the DNA sequence of the previous part, write out the DNA with the exons in upper case characters, and the intron in lower case.