**2. Transcription**

Transcription produces a **messenger RNA** molecule (**mRNA**), which has the same nitrogenous bases sequence as the **coding DNA strand** in the same orientation. **RNA strands** are made of **ribonucleotides**, which can have the same nitrogenous bases as those in Table 1A, except that **Thymine (T)** is replaced by **Uracil (U)**. mRNAs are expendable molecules that will be translated into polypetide chains in the cytoplasm. mRNA molecules are suitable for this operation, because mRNAs carry the information of a gene that is currently needed, and cells can produce, or destroy them, depending on various environmental factors, or signals. DNA molecules serve only as the library that always keep safe the total genetic information of the cell during its life cycle.

| **Table 1B: RNA Nitrogenous bases** |
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|  | **Name** | **Category** |
| --- | --- | --- |
| 1. | Adenine (A) | Purine |
| 2. | Uracil (U) | Pyrimidine |
| 3. | Guanine (G) | Purine |
| 4. | Cytosine (C) | Pyrimidine |

**RNA polymerase** is the enzyme that synthesizes the mRNA strands by pairing **ribonucleotides** to the complementary **deoxyribonucleotides** of the non coding strand in an antiparallel orientation.

According to Chargaff's rule the complementary pairings are:

1. A pairs with U via 2 Hydrogen bonds.
2. A pairs with T via 2 Hydrogen bonds.
3. G pairs with C via 3 Hydrogen bonds.

**Example 2**

For the DNA coding sequence:

5' ATGGAGCTCTAA 3'

the mRNA will be:

5' AUGGAGCUCUAA 3'

The script accepts that introns does not exist in the DNA sequence.