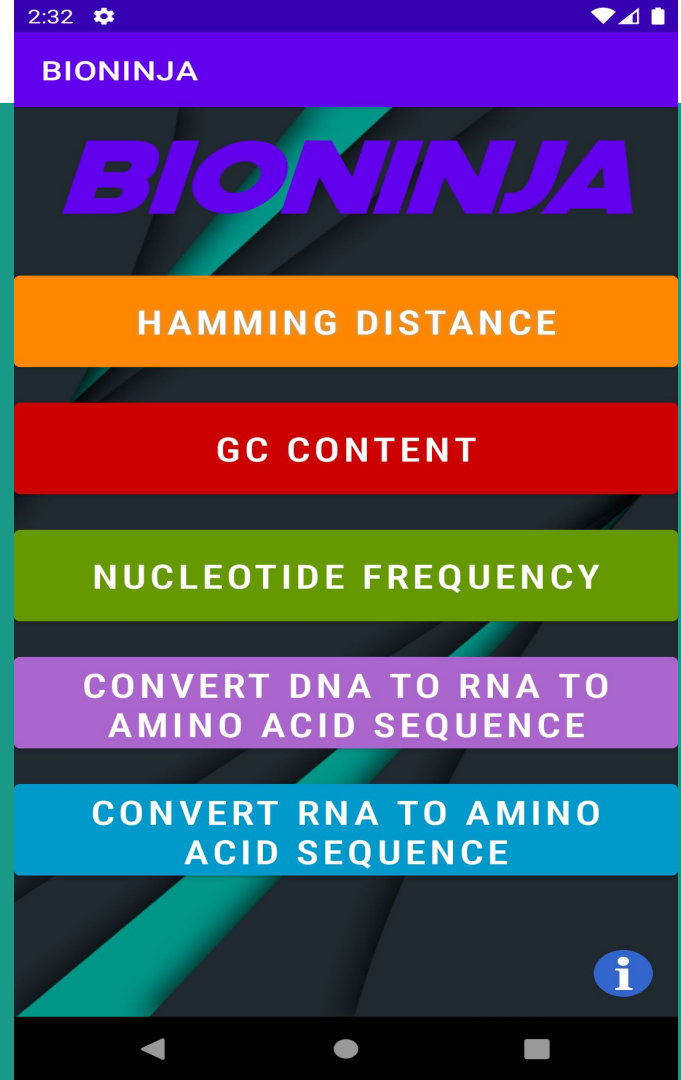


BioNinja - Multipurpose Bio-Calculator

Team NucleoHeights :-



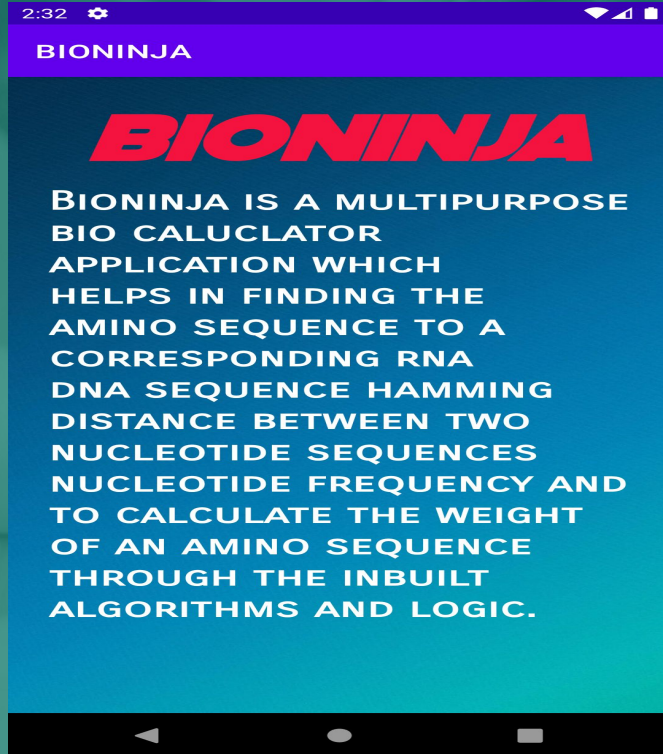
ABOUT BIONINJA



BioNinja is a multipurpose calculator made in android studio and provides a convenient and compatible way to find out result of some of the necessary biology terms related to DNA/RNA (mentioned below):-

- Hamming distance
- GC Content
- Nucleotide Frequency
- Converting DNA to RNA to amino acid
- Converting RNA to amino acid sequence

How can it benefit ?

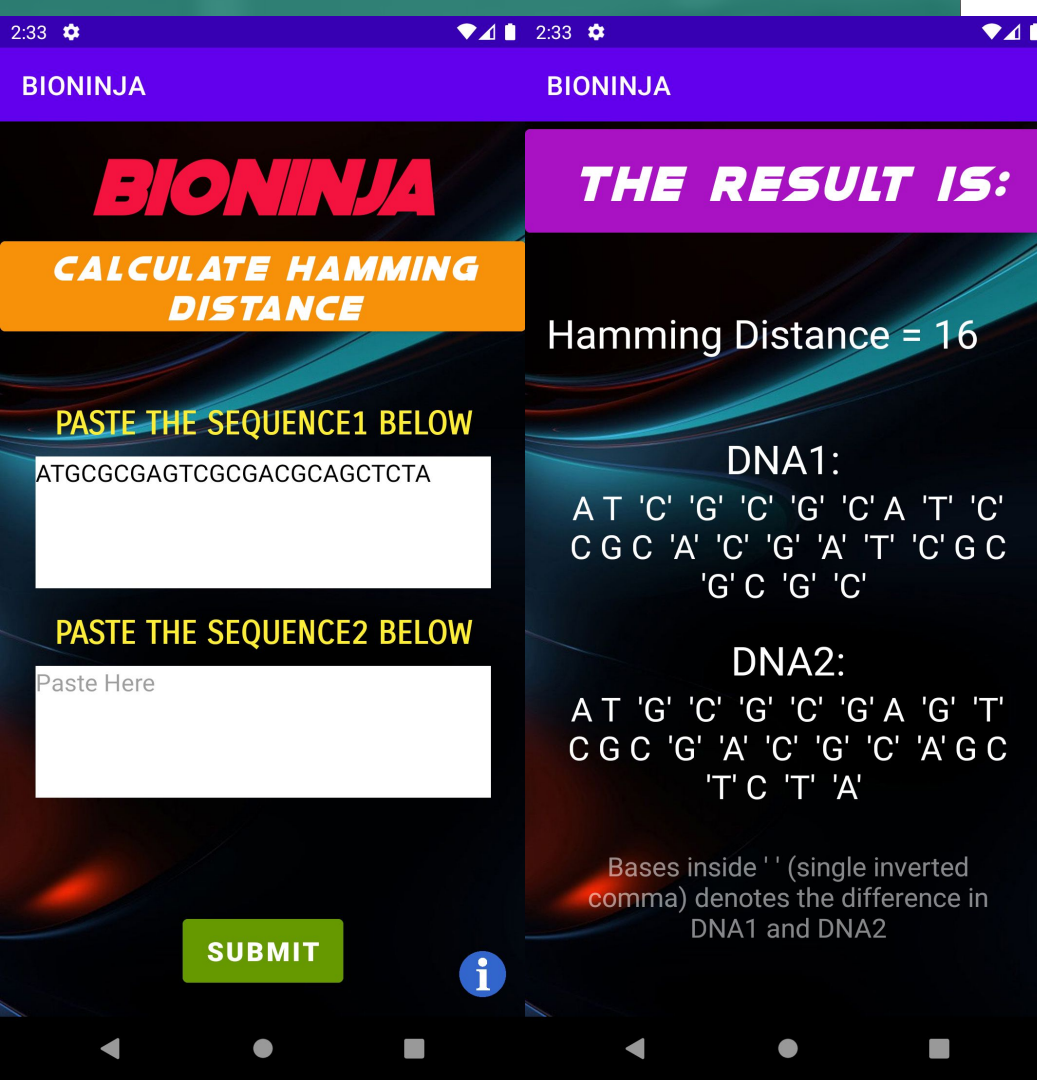


BioNinja is fast and has an easy to use interface .

Can be installed in android phone with android version > 8.0

It works offline and calculates the result within a few seconds

Has the option of uploading a text file which makes it easier in case of long sequences

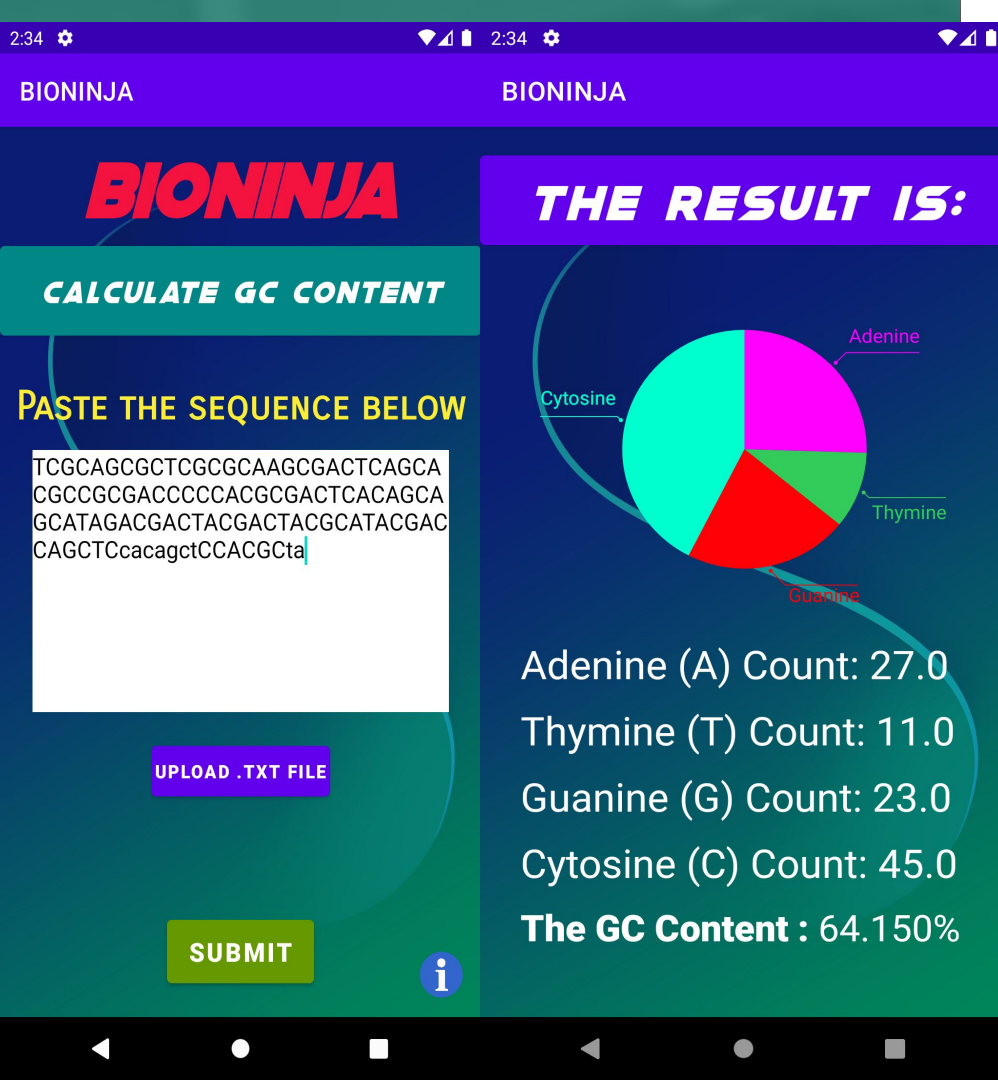


Calculating Hamming Distance

First enter the DNA sequence1 in the text field1 , and then the DNA sequence2 in the text field2 , and then press “SUBMIT”

After this the result displays as shown on left side.

How it calculates-> It compares the string of each sequence individually and then counts those which are different.



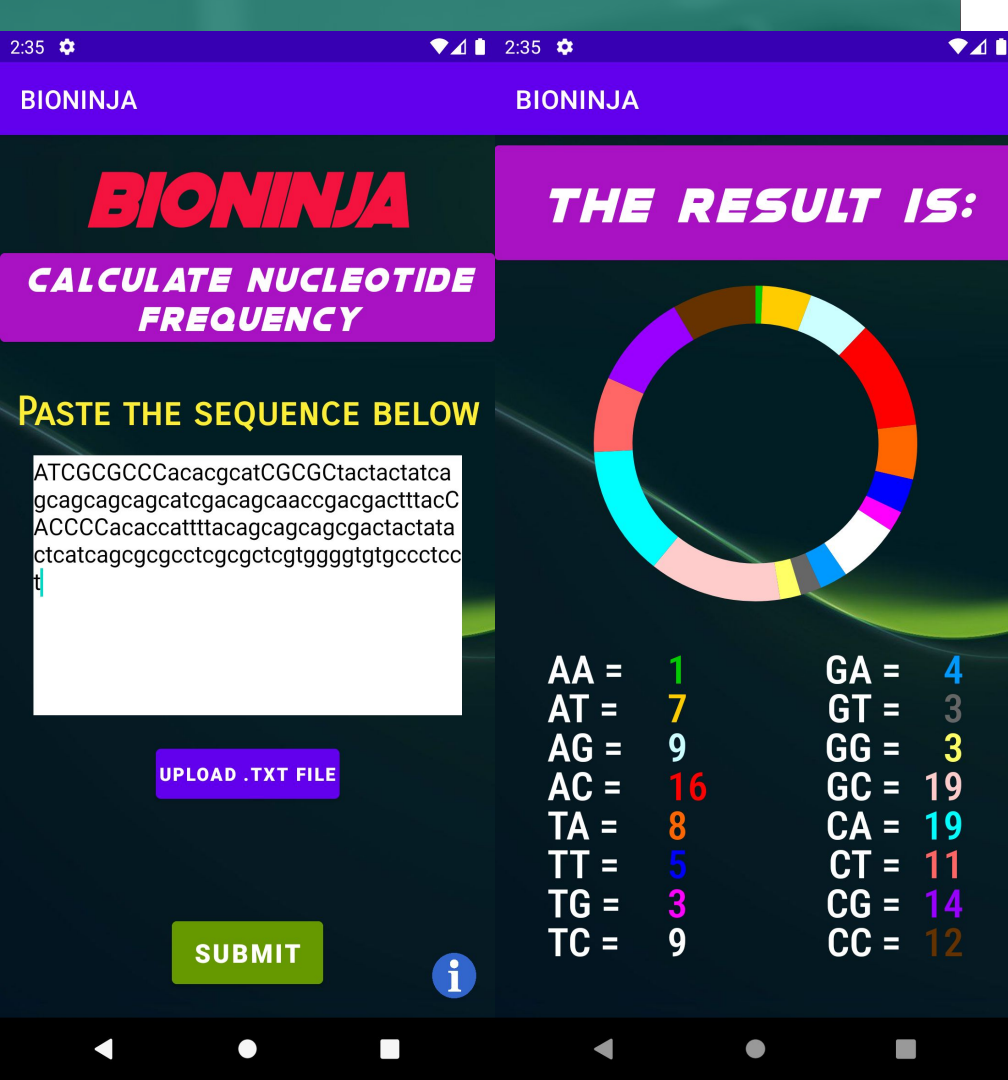
Calculating GC content

It has two options ,either paste the sequence in text field or upload a .txt in which sequence is present and then press "SUBMIT"

After this the result displays as shown .

How it calculates-> It calculates the number of 'G' and 'C' in the sequence and displays the result using the formula -

$$\text{Count of (G+C)} / \text{Count of (A+T+G+C)} * 100$$

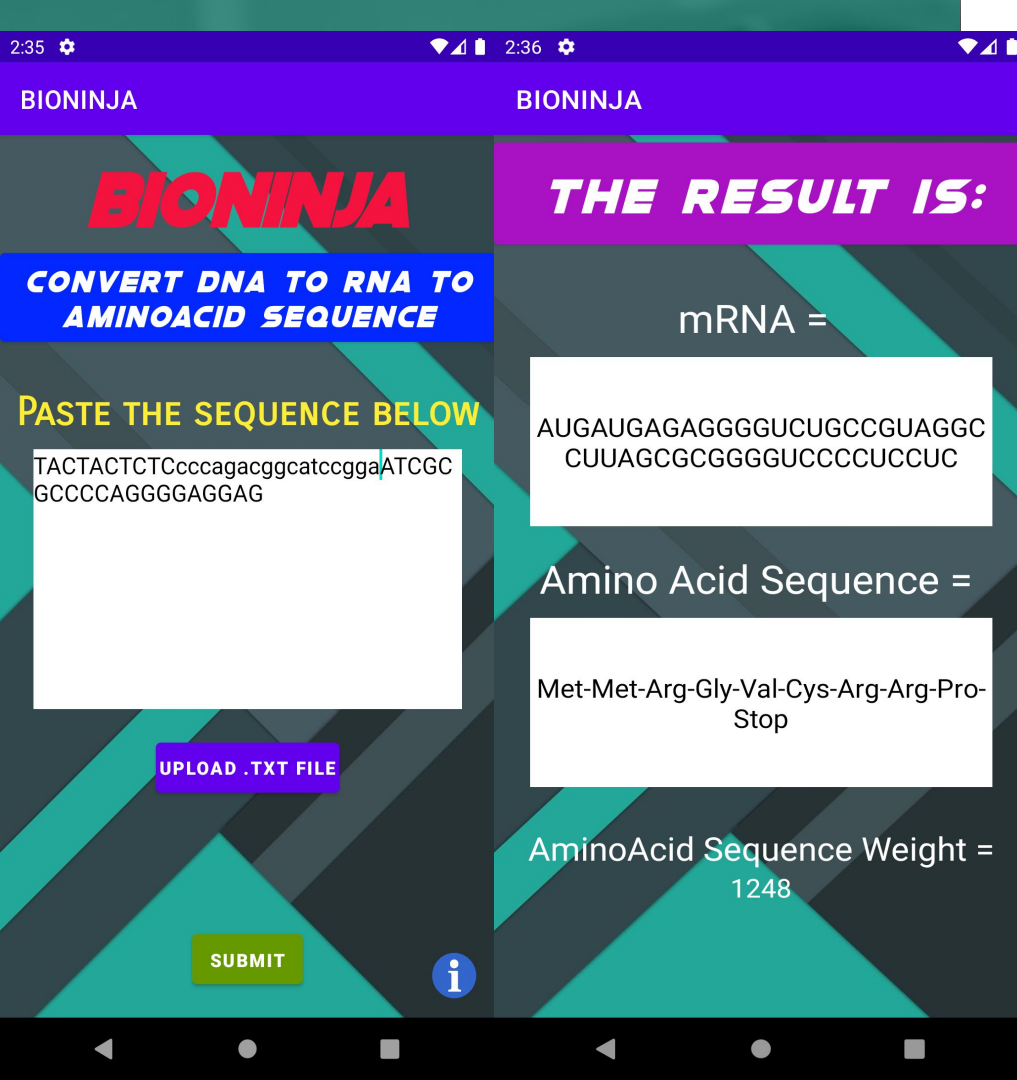


Calculating Nucleotide Frequency

It has two options ,either paste the sequence in text field or upload a .txt in which sequence is present and then press "SUBMIT".

After this the result displays as shown .

How it calculates-> It calculated the frequency of each of the distinct nucleotides in 2-2 base pairs and then forms a pie chart as shown.We have considered the non-overlapping case.

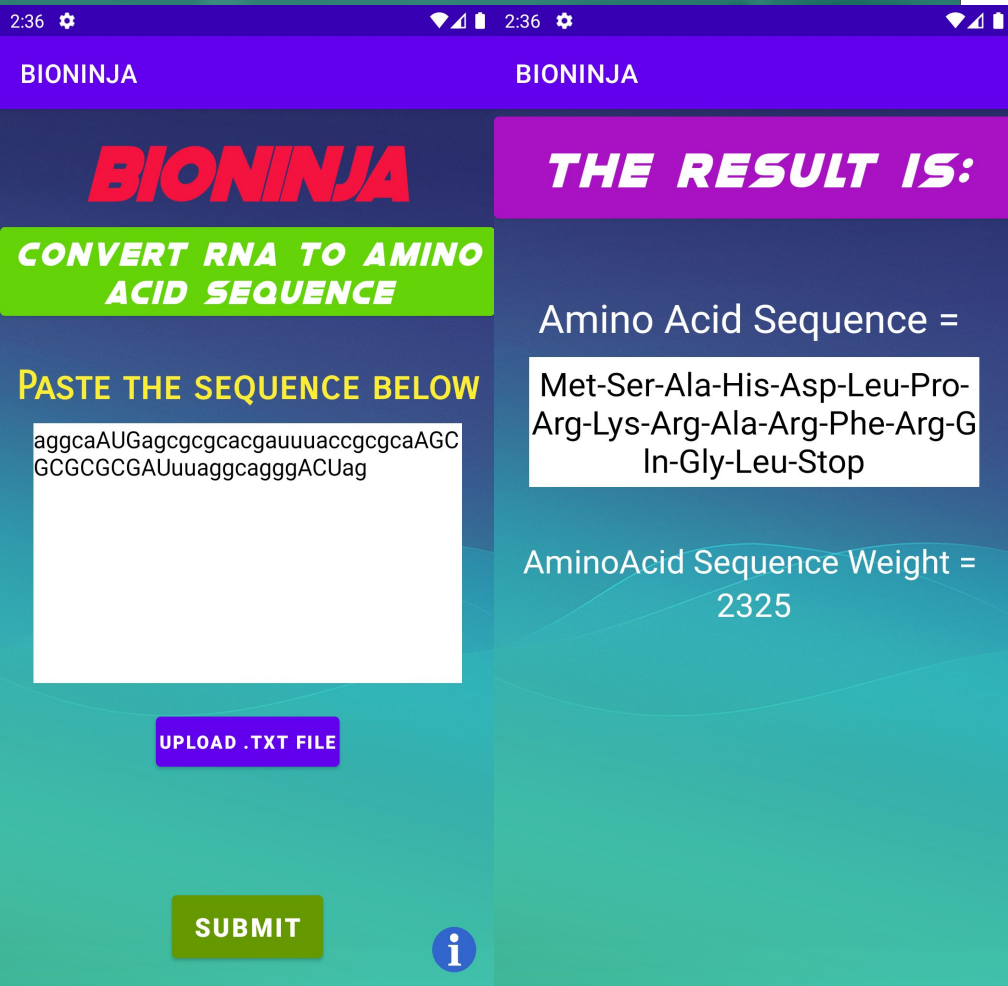


Converting DNA to RNA to amino acid

It has two options ,either paste the sequence in text field or upload a .txt in which sequence is present and then press “SUBMIT”.

After this the result displays as shown.

How it calculates-> It first converts the DNA to RNA by replacing with complimentary base pairs and then for amino acid finds the start codon and keeps on replacing codon with amino acid and also calculates the weight of it.



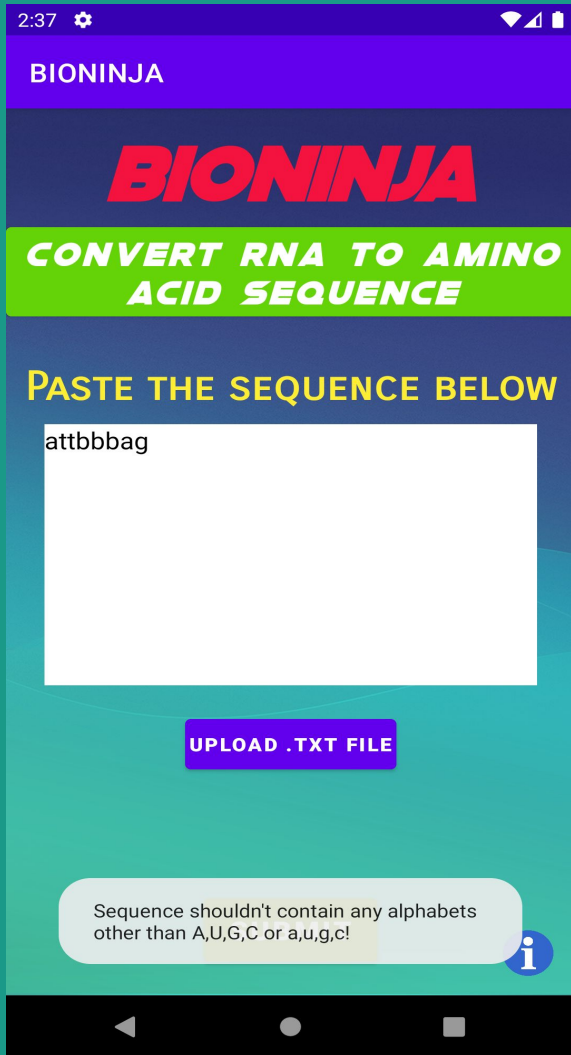
Converting RNA to Amino acid

It has two options ,either paste the sequence in text field or upload a .txt in which sequence is present and then press “SUBMIT”.

After this the result displays as shown.

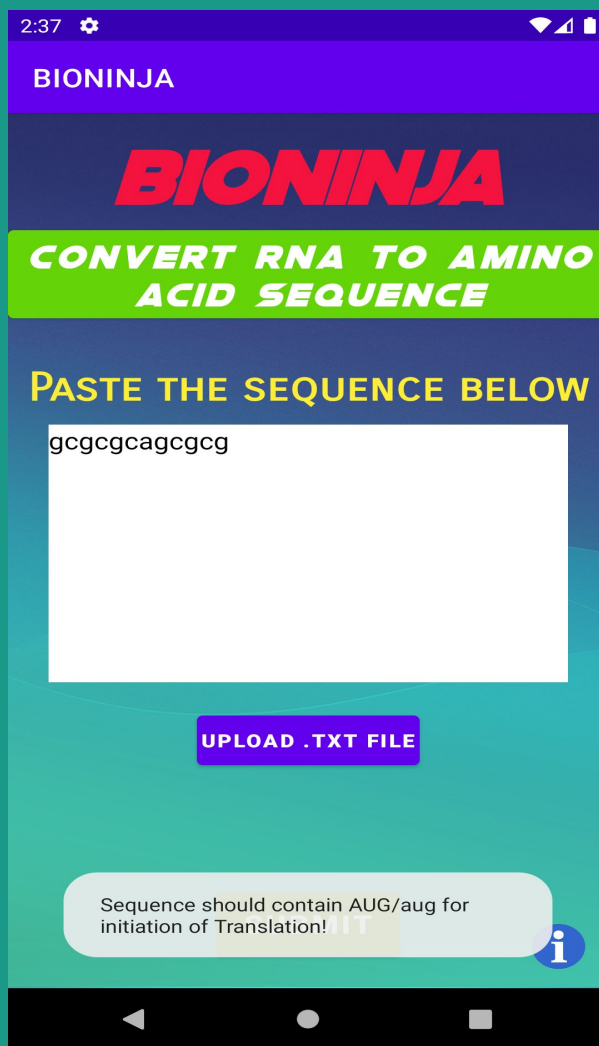
How it calculates-> It first finds the start codon in the sequence and then keeps on replacing codon with amino acid and also calculates the weight of it.

Exception Handling



Sequence shouldn't contain any alphabets other than A,U,G,C or a,u,g,c!

Sequence shouldn't contain any alphabets other than A,U,G,C or a,u,g,c!



Sequence should contain AUG/aug for initiation of Translation!

2:38

BIONINJA

BIONINJA

**CONVERT DNA TO RNA TO
AMINOACID SEQUENCE**

PASTE THE SEQUENCE BELOW

gcgcgacgcgtagct

UPLOAD .TXT FILE

Sequence should contain TAC/tac for initiation of Transcription!

Sequence should contain TAC/tac for initiation of Transcription!

THE END

[Image source link](#)

