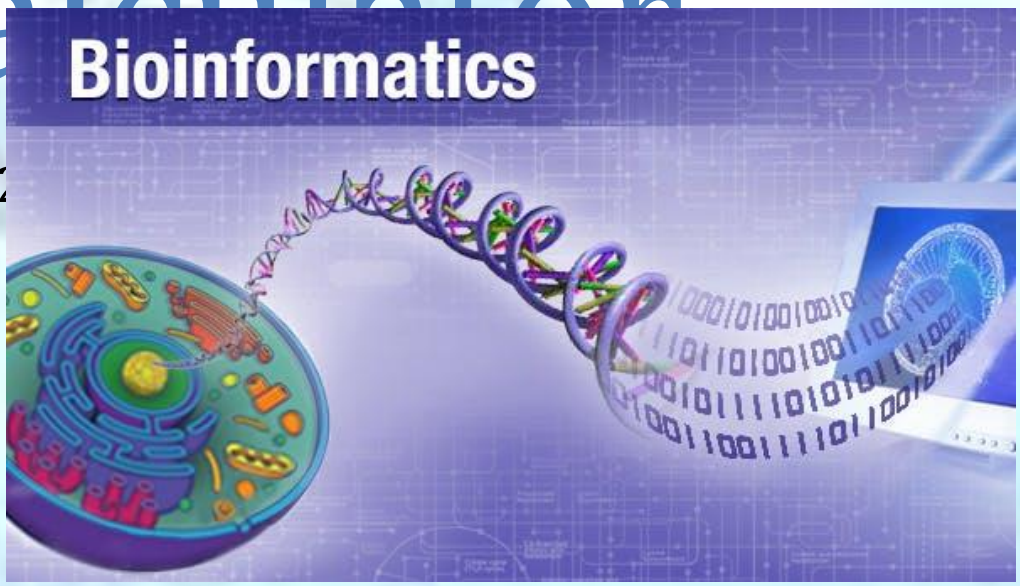
Name-Arabinda Chand

Project-Amino Acid Calculator

Batch-



Computer science
2/10/2022

Certificate

This is to certify that Arabinda Chand of class 12 of poddar brio international school has successfully completed his/her project work for the subject 'Computer science' for class XII project of the Central Board of Secondary Education in the year 2021-2022.

Acknowledgement

I would like to thank my teacher Miss. Pooja Nimroth(PGT computer science) who gave me this opportunity to work on this project. I got to learn a lot from this project about How I can take first step towards integrating computer science with biology . I would also like to thank our school principal Miss. Rashmi Singh.

At last, I would like to extend my heartfelt thanks to my parents because without their help this project would not have been successful. Finally, I would like to thank my dear friends who have been with me all the time.

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Introduction

To sql

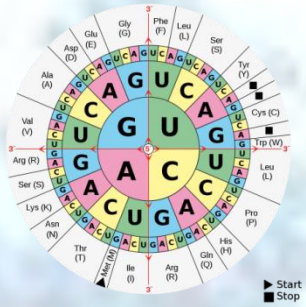
Structured query language provides codes to define data structure, manipulate data in a database & retrieving data in a database

To python

Python is High level programming language. It was initially designed by Guido Van Rossum in 1991 in Centrum Wiskunde de Informatica, Netherlands

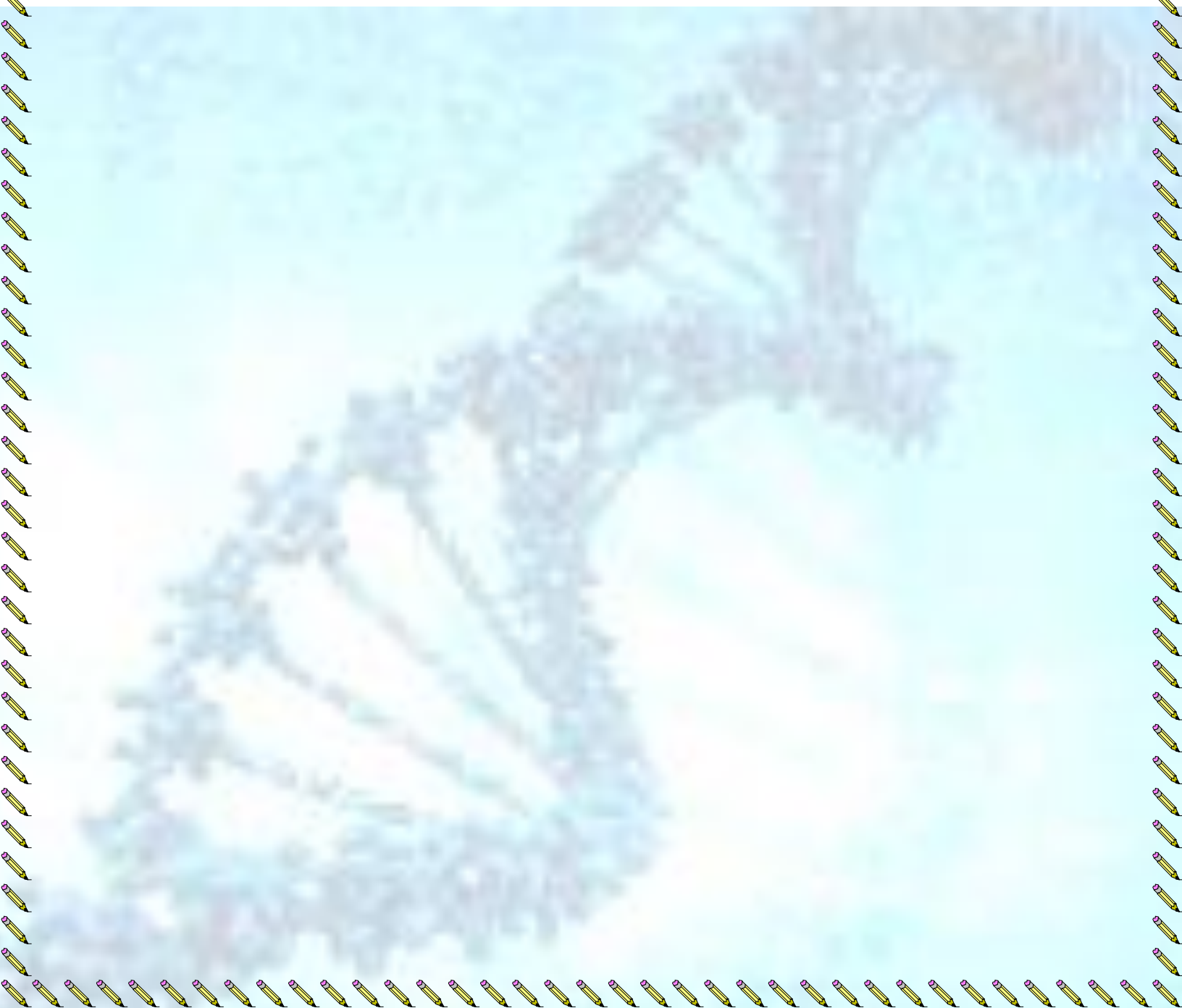
To project

Introducing you to the future of calculators for biological application. Launching with the glory of genetics welcome to the world of dna with amino acid calculator. Which can tell you efficiently the name of any triplet (nucleotide base) codon corresponding to any of its amino acid. You can use it instead of memorizing the stack of 64 codon table of amino acids. Which can be problematic for many & it was also the first step to achieve the target of integrating biology with computer science with using practicality.



Objective

To produce an amino-acid calculator which could recognize an element



Hardware & software requirement

Hardware requirement-windows 7 laptop, a printer

Software requirement-python, pip connector which can connect python mysql,mysql,word(2007)

Advantages of sql	Disadvantages of mysql
Sql is portable	More features implemented in proprietor way
It is of high speed	
Easy to learn	
Relational database	
Not case-sensitive	Difficult to interface
Data consistency	
Object based	
Client/server	
Programming & interactive language	

Advantages of python	Disadvantages of python
Easy to learn & use	It is not the fastest language(slower than compiled ones)
General purpose programming language	Lesser libraries than c, java & perl
Interpreted(pre-compiled) & Interactive	Not strong on type binding(gives runtime error)
Portable	Not easily convertible

Python library, easy & short syntax, highlighting & error detection Graphical User Interface	Primitive Database access Weak for mobile development
Extensible/extendable language	Memory consumption
Free & open source	
Object oriented	

Project

Feature

- It has average 0.5 secs runtime and it has 121 bits
- It can be used instead of memorizing the table
- It is very fast & non tedious
- It is 99% accurate
- It focuses on use of computer science in biology
- It is originally made in india
- It can also tell you about start or stop codons

Limitations

- It can't be used for any other purpose
- Some people may prefer to rely more on memorizing for brainstorming for independence from the calculator

Coding

code in python-

```
import mysql.connector
econ=mysql.connector.connect(host='localhost',
                             password='12345678',
                             user='root',
                             database='amino_acid_calculator')
cursor=con.cursor()
code=input('enter your triplet')
sql='select*from covid_warrior where codon=%s'
dna=(code,)
cursor.execute(sql,dna)
output=cursor.fetchall()
for x in output:
    print(x)
con.close()
```

code in mysql-

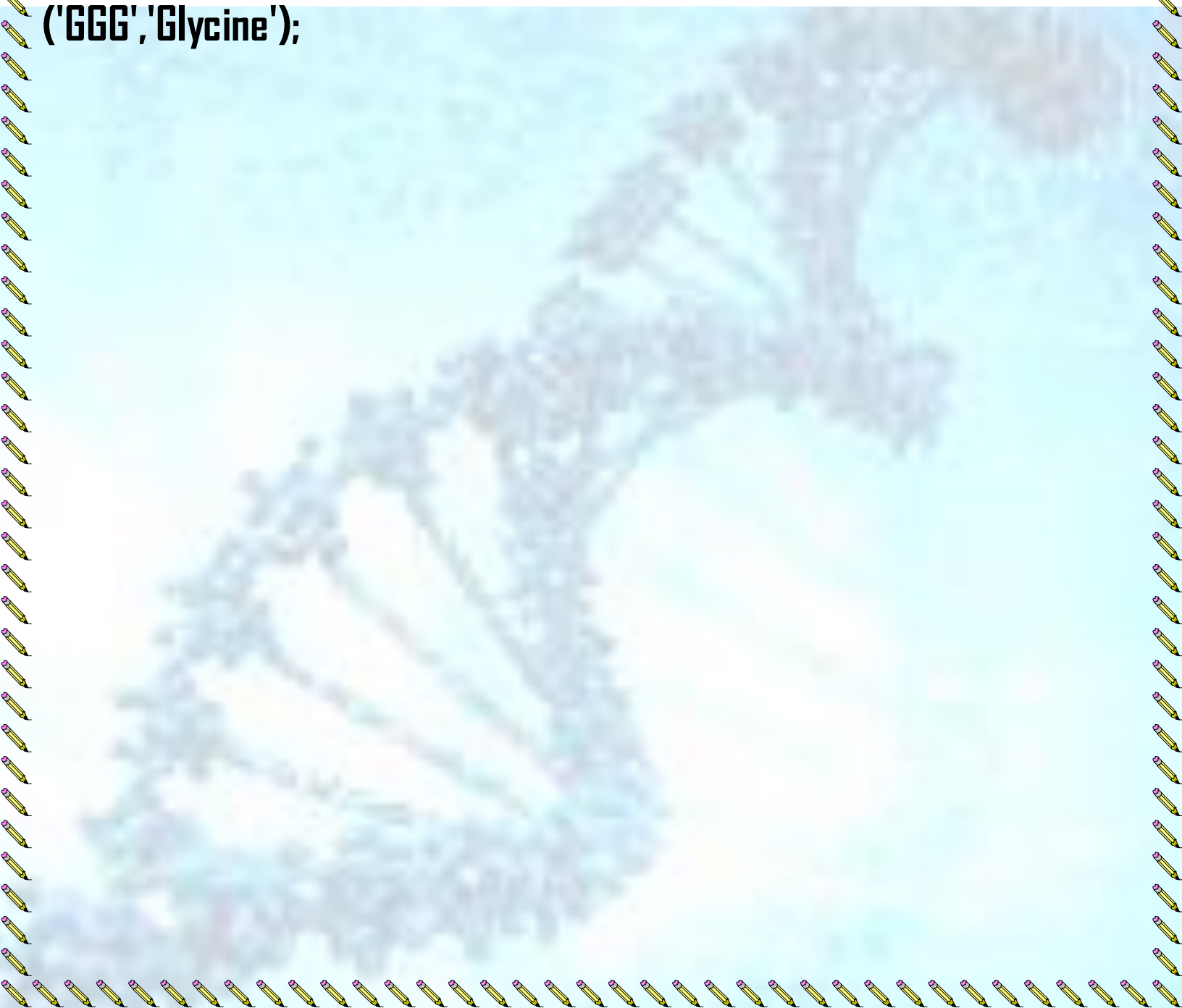
```
CREATE DATABASE amino_acid_calculator;
USE amino_acid_calculator;
```

```
CREATE TABLE covid_warrior (codon varchar(250) NOT NULL
PRIMARY KEY,amino_acid varchar(250) NOT NULL);
INSERT INTO covid_warrior (codon,amino_acid)
VALUES ('UUU', 'Phenylalanine'),
('UUC', 'Phenylalanine'),
('UUA','Leucine'),
('UUG','Leucine'),
('CUU','Leucine'),
('CUC','Leucine'),
('CUA','Leucine'),
('CUG','Leucine'),
('AUU','Isoleucine'),
('AUC','Isoleucine'),
('AUA','Isoleucine'),
('AUG','Methionine(start)'),
('GUU','Valine'),
('GUC','Valine'),
('GUA','Valine'),
('GUG','Valine'),
('UCU','Serine'),
```

('UCC','Serine'),
('UCA','Serine'),
('UCG','Serine'),
('CCU','Proline'),
('CCC','Proline'),
('CCA','Proline'),
('CCG','Proline'),
('ACU','Threonine'),
('ACC','Threonine'),
('ACA','Threonine'),
('ACG','Threonine'),
('GCU','Alanine'),
('GCC','Alanine'),
('GCA','Alanine'),
('GCG','Alanine'),
('UAU','Tryptophan'),
('UAC','Tryptophan'),
('UAA','Stop(ochre)'),
('UAG','Stop(amber)'),
('CAU','Histidine'),

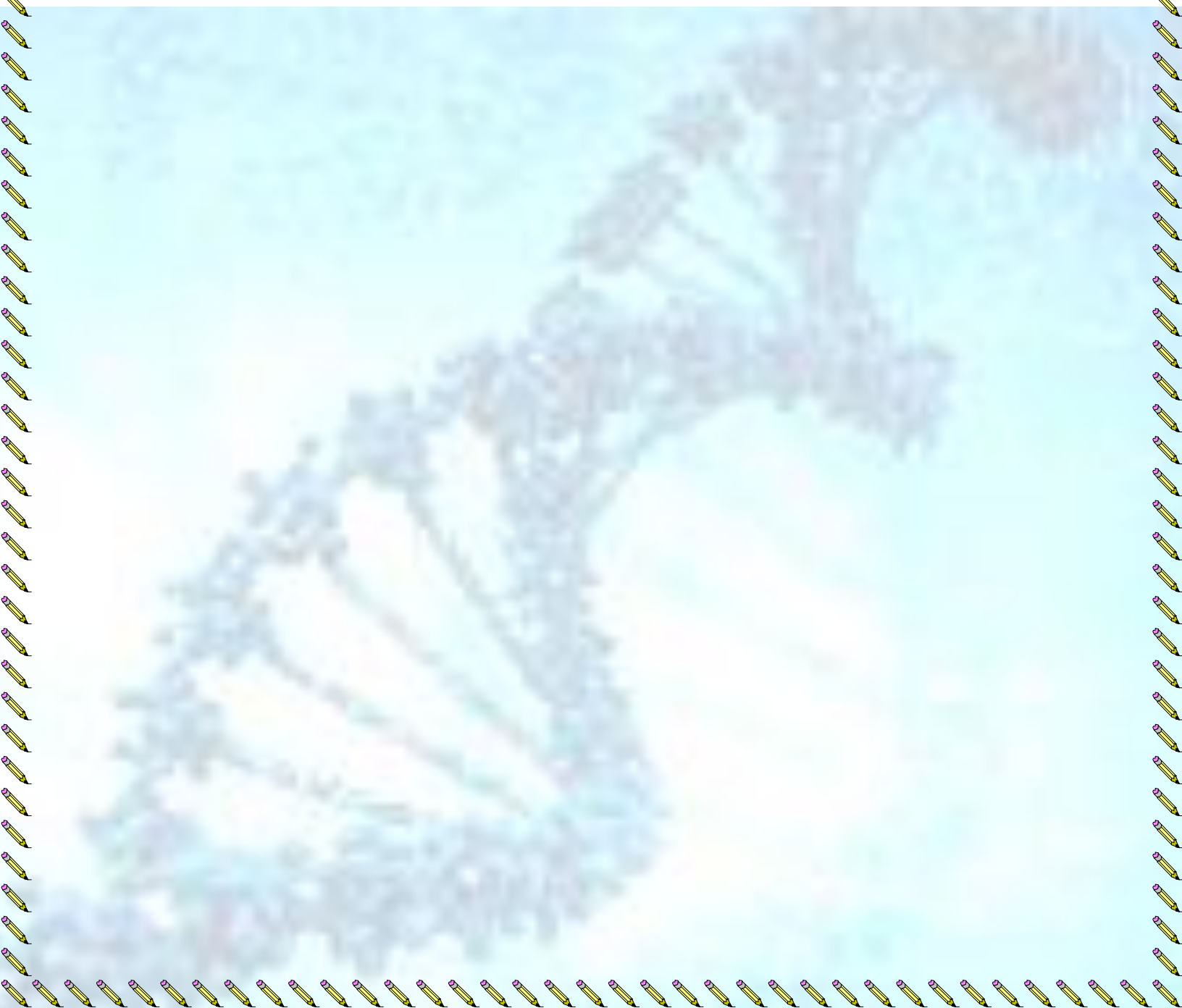
('CAC','Histidine'),
('CAA','Glutamine'),
('CAG','Glutamine'),
('AAU','Asparigine'),
('AAC','Asparigine'),
('AAA','Lysine'),
('AAG','Lysine'),
('GAU','Aspartic acid'),
('GAC','Aspartic acid'),
('GAA','Glutamic acid'),
('GAG','Glutamic acid'),
('UGU','Cysteine'),
('UGC','Cysteine'),
('UGA','Stop(opal)'),
('UGG','Tryptophan'),
('CGU','Arginine'),
('CGC','Arginine'),
('CGA','Arginine'),
('CGG','Arginine'),
('AGU','Serine'),

('AGC','Serine'),
('AGA','Arginine'),
('AGG','Arginine'),
('GGU','Glycine'),
('GGC','Glycine'),
('GGA','Glycine'),
('GGG','Glycine');



Future through this project

Bioinformatics is an emerging area where computers make old biology efficient whose era is yet to boom because people are getting interested for the speed,efficiency & accuracy of computer in biology.



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