Orientation and Introduction

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Agenda

Introduction to Bioinformatics:

   - what is it ?

   - DNA & RNA

Intro to python :

   - conditions

   - loops

   - functions

Intro to Rosalind

Welcome to AUG problem solving

We are so glade that you are here and we wish you a great time learning and discovering with us ….

We are proud of you

First Session Instructor

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Season (October 22) Schedule

14 / 10 /2022

Intro to Bioinformatics.

Intro to Python (Conditions & Loops & Functions).

Intro to Rosalind.

21 / 10 /2022

Play with Strings.

Lists & Tuples.

Dictionaries & Sets.

28 / 10 /2022

Files & FASTA files.

Python Packages.

04 / 11 /2022

Biology Principals.

Counting & Complementing DNA.

DNA Transcription.

11 / 11 /2022

Recapping on Biology.

Bio-Python library.

GC Content & GC Skew.

18 / 11 /2022

Extracting K-mers Sequence.

Popular K-mers & (**X**) mismatches.

Final Session

25 / 11 / 2022

CONTEST

1-Intro to Bioinformatics

What is Bioinformatics ??

an interdisciplinary field that develops methods and software tools for understanding biological data
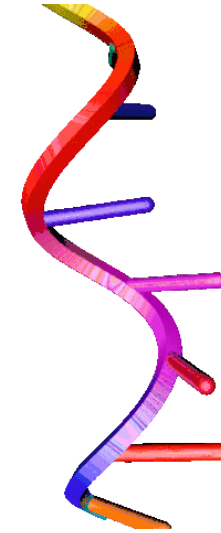
What is the difference between RNA & DNA ??

DNA :

Double string – humans – animals

RNA :

single string – viruses

2-Intro to Python

What is python?

- 4G language

- Code structure (next slide)

- Indentation(while we are working)

- Syntax error

- Data type

- Comment (google search)

Code Structure

Statement

one line of code doing a thing

Ex:

```
print ("hello world")
```

Block

more than one line doing a thing or two

Ex:

```
if (a>b):
    print ("a is biger than b")
    print (" b is smaller than a")
```

Python

- printing :

    print ("hello world")

- Taking input :

    input ("enter the name")

- variable:

    x

If Condition

Law law law law kann el 2mr 2mry , law kan fy 4y2 bydyy

```python
if ("el2mr 2mry" and "law fy 4y2 bydy"):
    print ("kont....")
else:
    print ("m4 bydyy")
```

Types of If

Nested IF:

If جوا if

```python
if ("pizza is available "):
    print (" eat pizza")
    if ("fy pepsi"):
        print ("drink pepsi")
```
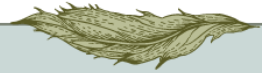
Conditional IF:

لو الشرط مش متحقق جرب غيره

```python
if ("pizza is available "):
    print (" eat pizza")
elif ("crep is available "):
    print("eat crep")
else :
    print(" eat ay haga ")
```

Try it ..

Traffic lights :

    write a program that takes one

    input (R or Y or G) and tell the user

    what to do (move , stop , get ready

    to move , get ready to stop)

The Traffic Light: An Everyday IF Statement

IF light is **red**, THEN stop!

IF light is **yellow**, THEN what???

IF light is **green**, THEN go!

Loops

هفضل الف و الف و الف وراكي هلف و الف و الف و الدنيا تاخدني
تلف تلف لحد م اشيب او عقلي يخف

```python
while ("l7d ma a4yb aw 32ly y5f"):
    print ("alef")

```

Types of loops in python

While loop :

```python
i = 0
while (i< 3):
    print ("alef")
    i+=1
```

For loop :

```python
for i in range(0,3):
    print ("alef")
```

Key words

Break

اطلع برا

Continue

skip

Example

Write a program that chooses a number randomly between 1 and 6 and takes an input to compare it if they are equal print done If not keep asking to take a number and do it all again
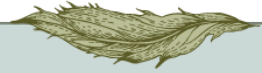
YOU DESERVE A BREAK
NETFLIX

Functions

Concept

Why do I need it?

Because you need to do some code independently but it makes the same thing every time
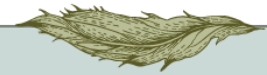
Types of functions

Built-in Functions:

Who can tell me like what??.

User Defined Functions:

You do it your self.
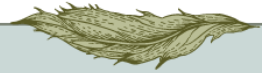
Example

Hello function


```python
def welcome (x):
    print("hello ,"+ x)


f=input(" enter your name ")
welcome(f)
```

Intro to Rosalind

Why do we use Rosalind ??

We all need a community to help us while we work on something to ask and to improve our selves in that's why we have Rosalind to help us improve in bioinformatics problem solving

Session Task

Is_pronic(num)

- This function takes a parameter and determents whether it's pronic or not

- Example :

    12 is pronic why ?? Because it's multiplying result of 3 and 4   (3*4 = 12)

Is_prime(num)

- This function takes a parameter and determents whether it'sprime or not .

- Example :

    9 is not prime because it can be divided by 3 and the result is integer (9 / 3= 3)

Resources :

DNA vs RNA:

- https://www.youtube.com/watch?v=JQByjprj_mA

 pycharm &python install:

- https://www.youtube.com/watch?v=qSJvVAC8uc8

Rosalind :

- https://rosalind.info/about/

 practice python :

- https://www.practicepython.org/

LeetCode :

- https://leetcode.com/

Thank you

We are excited to see you next session