Tirgul 5 LIVE 08-11-21

**The min in the lecture record**

12:00~ Command Line Arguments

12:08 Clean Code

12:08 Clean Code-Advantage

12:18 enumerate function- run for loop on the indexes + the value

12:26 Refactoring

12:30 Testing

12:34 Using Pytest

12:36 assert function

12:57 Debagger

13:19 Full Program Example

Step 1 - What the most simple single action that I can do.

Step 2 – Define function for later use with the input pass

Step 3 – for the single function looking for extremes condition.

13:36 Ex 5

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**The min in the lecture record**

12:03 Algorithm

12:05 **Running Time** (“number of operation”)

-how many iteration/recursion call: “basic operation”

-how many operation are done in each one

12:12 Big O notation



12:17 How fast a function grow

12:27 examples of O( )

12:36 Modulo i == 0 is for prime number!

13:11 Bubble Sort

13:25 Loop invariant

13:39 o(1) of dict

Questions –

Whey we need the worst case in the פלט of T(n)

Flag

What is invariant

O() of sort

**Class 24-11-21**

**The min in the lecture record**

06:00 How do we use recursion

09:00 Base case

09:50 The Three Laws of Recursion

1. Base case
2. Moving Towards the base case
3. Must call it self

11:00 Example: Golden Ratio

19:00 Example: infinity series

20:07 “Solutions for problem(N) that we know the

Solution for the simplest problem (N-1)”

20:03 Recursion vs. loops

-palindrome [1,2,3,2,1]

-print Vertically: base case- print the word

-Pascal Triangle: base case- calculate the first

row of the triangle

34:00 -Tower of Hanoi: base case-

For two disks

1. Move the smallest(1) to C
2. Move the Largest(2) to B
3. Move the smallest(1) to B

38:22 -Next step(3 disks)

1. Move disks 1,2 from A to C using pole B
2. Move disk 3 from A to B
3. Move disks 1,2 from C to B using pole A

43:00 MargeSort

Base case: two numbers

1:02:30 MatgeSort Run time is O(n log n)

1:12:00 Run time for recursion functiuon

T(n) = 2T(n/2) + O(n)

1:18:00 Run time that is going like סדרה הנדסית O(n)

\*we saw last week running time that going like סדרה חשבונית O(n^2)

1:19:00

Turtle Fractals - Base case if len\_line<0

Turtle Tree- Base case if brach\_len >5

Sierpnski Triangle

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09:00 Reminder - The Three Laws of Recursion

10:00 All Subsets- for grope A find all the under group of A

19:00 Examples of all subsets

27:00 Knapsack – stiling the most value items with maximize your profit

34:50 Knapsack- Optimization

47:00 Knapsack- complexity

1:09:00 N-Queens

1:27:00 All Subsets of Size k

1:31:00 Subsets Sum

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08:50 POP vs OOP

14:30 Classes

16:50 Object

-instance

20:00 Members

-Object.member

22:00 METHODS (Function that belong to some Classe)

28:30 Method \_init\_()

-used for initializing

37:55 Class Variables

1:07:00 Add a Class

1:12:00 Private Members

1:15:00 Getters and Setters

1:19:00 Encapsulation

1:31:30 Other Special Operators

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## Linked Lists

12:06 Complexity

12:15 Common Mistake

12:21 מימוש של "רשימת קישורים"

12:30 Question for writing Linked List:

-Does It work in empty List

-Does it worked for an 1 argument List

-Does it work for more than 1 argument

12:32 Reversing Linked List Example

12:36 Double-Linked List

-Next and Previous

12:45 Remove First argument

13:08 “Complexity is Back”

## Queues

13:13 General Explain

13:15 API for Queues- Building MyQueue

## Trees

13:23 General Explain

12:24 Definition

12:26 Binary Search Tree

12:33 Building Tree – API TreeNode

## Example from past exams

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# Exceptions

12:06 Exceptions motivation

12:15 def \_\_getitem\_\_(self, index)

12:17 raise an exception

if \_\_\_\_\_\_:

rais Exception

12:19 Try and except

12:29 Except TypeError

# Creating Function in Python

13:06 Lambda

## Nested Function

13:13 function inside function

13:18 Closer Syntax

13:20 Closers Examples- חיבור חיסור כפל ונגזרת

13:34 Decorator

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