Name: Puja Ghosh

ID: 011191116

Recursion:

It helps to break down a big problems into smaller ones. It causes repeating occurrence of particular event. It's a procedure that call themselves to find the solution. It has base case and recursive calls which help us to find solution to a certain problem. It help us to lead to simple and elegant solutions.

Divide and Conquer:

It is a general algorithm where there's three part present in order to find solution of a certain problem as divide, conquer and combine. In this we need to divide a problem into two parts. There is sub problems present inside by dividing the main problem. It helps us to find solution easily as problem divided into half. It help us to conquer the sub problems by recursively solving them and combining the solution for the original problem.

Greedy Algorithm:

It's an algorithm that help us to make the best choice for us at that particular moment. It can provide us best solution by chosing the local optimum we can get the global optimum. It help us to get best solution without future regard. It provide optimal global solution containing optimal solution of all its sub problems. It's easy to implement and mostly time efficient.

Dynamin Programming:

It breaks problem into series of overlapping sub problems and build solution to larger sub problems. It provide solution to a problem which is composition of sub problems solution. It solves every sub problem just once and recursively define the value of an optimal solution .It help us to get answers of a particular problem in systemically records to sub problems and can be re-used rather than re-computing. It can provide an optimal solution from computed information for that particular problem.

Problems and Strategy:

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recursion

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1.) Find the conversion of binary to decimal:

such as; 100(bin)=4(dec)

Strategy:

first user will input a binary number then

it'll be check recursively by the function

as, we'll mod the number,n, by 10 and the add

with 2 multiplying by the funtion calling itself

and dividing number,n, that by 10.

we do mod and divide by 10 cause decimal base is 10

2.) Find the conversion of decimal to binary:

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with 10 multiplying by the funtion calling itself

and dividing number,n, that by 2.

we do mod and divide by 2 cause binary base is 2

divide &conquer

1.) Find very first missing element in array:

such as; given [0,1,3,4,5]

here very first number missing is 2 but here we get in index 2 as 3

Strategy:

from given sorted array we need to find number which is missing

accordingly; such that; likewise index numbers numbers will be placed

and if not then a number is missing there in that place where some

other number is placed in that particular index.

2.) Find floor of numbers in a sorted integer array:

suc as; given[1,3,7]

for 0 floor-0

for 1 floor-1

for 2 floor-2

for 3 floor-3 ; like this so on

Strategy:

from 0 to 10, we need to check whether elements same with given array

elements. such as, if x as an element from 0 to 10 and we'll check

with the given array in this within conditions as;

if xis equal to zero, then its'sfloor is zero

if x is equal to mid element, then it's floor

if x is less than mid element then floor exist in left sub array

if x is more than mid element then floor exist in right sub array

greedy algorithm:

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1.) Find minimum number of platforms required in a train station:

arrival time-[2.00,2.10,3.00,3.20,3.50,5.10]

departure time-[2.30,3.40,3.20,4.30,4.00,5.30]

Strategy:

from arrival and departure time,we need to find minimum platform required, we can see that;

when departure time is less than next arrival time, then neededplatform less platform and increase neededplatform,

if departure time is greater than arrival time,then decrease neededplatform and go to next departure time of train

2.)Find the maximum calorie burn in the gym after dietian prescription:

my workout:

workoutname-time(min)-calorie

a-3-50

b-2-35

c-1-15

d-2-30

dietitian's plan:

workoutname-time(min)

b-25

d-15

c-10

a-20

Strategy:

from given daily workout with respective time and calorie burn, dietian made some changes within timing giving limit how much to do which workout,and from this we need to find the maximum calorie burn per min according to specific time of dietitian where calorie can be burnt maximum.

dynamic programming:

1.) Find all N-digit binary string that has no consecutive 1:

such as; 00,10,01 when n=2 we get 3 string

Strategy:

from given number, we need to find binary digit string which

donot have consecutive 1's and we can see that;

if string ends with 0 then, we can have both 0 and 1,

if string ends with 1 then, we can have 0 only

2.) Find length of longest palindrome substring:

such as; given string [ABDFCF]

here length is 3 as far for 'FCF'

Strategy:

from a given string, we need to find the longest palindrome substring,

we can see that;

if first character and last character of string is same then ,

we'll include first & last character and recursing remaining substring

if last character is different from first character then, get max value

from (remove last character and recurse remaining substring) and

(remove first character and recurse remaining substring)