

Greedy Algorithms

A greedy algorithm selects the best available oftions at each ctep, without suconsidering previous choices, aiming local oftimization.

Top-down approach :-

- Works on top clown approach, makes clacision based on current best options.
- -> The algorithm doesn't reverse decisions even if they durin out to be sub-oftimal.

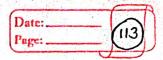
Eloments of Greedy Approach:

- 1. Greedy Choice Property: Optimal electrisions made at each step
- 2 Optimal substructure: subproblems contribute to grobal optimum.
- 3. Greaty Strategy: Rule for selecting the best option at each step-
- 4. hocal Optimization: Focus on immediate best solution
- 5. No Backtracking: Necisions are final can get reversed

Advantage:

- -> Fasy and Fast
- Sometimes performs better than other algorithms sometimes.

an very	
	Caching using Greedy Algorithm:
	The caching problems arise from limitation of first space.
	Assume carche Chas & pages
	C = ABCDE
	Commission of the section of the sec
Emples 100	Now we want to process a sequence of miterus which must
	be placed in cache perfore they are processed.
and the state	If m <= k liver a section of a warre have to when the section of
	m = A F any problem.
	* F for f since it not is code toppour
	C = F B C D E A from Cache and place F
	A STREET CALL CONTRACTOR STREET STREET CONTRACTOR DESCRIPTION OF STREET CONTRACTOR OF STREET
	Je m > k -> cache hit when item is only prespent in both.
	-) cache min if not present in cache.
	In cache miss; bring the requested item to cache other and evict quother.
Greedy S	FIFO: - Oldert page gets evicted
Strategics]	FIFO: - Oldest page gets evicted.



1	
	Fractional Knapsack Problem:
12 73	and the second of the second o
	The FKP is a classic optimization problem where the goal is to
	maximize the total value (profit) of items relected, giving constraint
	on maximum weight the knapsack can hold.
	Three Greedy Affordaches:
	and the same in the same of th
	1. Selecting the items based on maximum profit:
	(i) Sort the items in highest to low profit.
	(ii) Start selecting one by one until Rnorpsack is full.
	(iii) If the knapsack is not completely filled, consider the
	(iv) fractional parts of next items.
	2. Selecting the etems based on minimum weight:
	(i) Sort the items in asending order of their weight.
1 - F	(ii) Start scholing it ems one by one until knapsack is full.
	(iii) If the knapsack is not completely felled, consider fractional
	parts of the next item.
	Later received in the will that the course of
	3. Selecting items based on profit to weight ratio:
	(i) Calculate the profit -to-weight ratio for each item.
	(ii) Sost the items indescending order of this ratio.
and the desired	(iii) Start selectine items one by one until the knapsack is full
	(iv) If the knowpsack is not completely filled, consider fractional
	parts of the next item.
	C= 8-9 1 1 2 1 2
1	* Greedy approach, particularly using the profit - to-weight ratio
	* Greedy approach, particularly using the profit - to-weight ratio, is preffered because of near optimal solution.

Abblications	:-
	_

Resource allocation.

2. Scheduling

3. optimization

Example:-

į				· PUSTOMETH	A TO ADD FAIL GRANNER	3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
		Thoms	Profit (P)	Weight (w)	P/W	4
	a - inches	m. 1	1 00 500200	and the old an	5/1=5	
		2	10	3 3 +12	10/3 = 3.3	
- 100	L AL FORNION	4 13MD	An 15 40	- 13500 - Auste	15/5 = 3	
	i Romani indo	. do4 Horas	10 7 / Tab	toda 418 see T	7/4=1.7	
	3	S. A.F.	- 4/28 to A	y harten Merica	8/1 = 8	1
		6	9	3	9/3 = 3	
	-1 15000	ns seturin	in 14 harm	2 134 36	1704/2 = 2	4
1	Wager bering and by	are de la		1 - N		

no of items (n) = 7

Arranging table with P/W descending items. >

	The state of the state of	with the state of	Friday to the Park	A ARCHANGE CONTROL OF THE CASE	Control of the Contro	- p to appropri
	water to the state of	Them	Profit	Weight	Remaining weight	
	made and has	5	<u> </u>	200 1 AL 200	115-1 = 14	
137	contact of the	. 1	sain Suestion	chartes	14-1 = 13	
	name a tirt	2400	33-10-4	3.0	13-3 = 10	
		3	15 4	us Signal	10-5 = 5	
		_ 6	9	3	5-3 = 2	
	instruction dis	7 7 M	west 4 drill	marche. Amon	2-2 = 04	No.
	.F4	Strains t	indicated the same	Peterness shere all	in the state of	

Them 4 is not added as the knapsack is filled adding item's' will result to overflow.



To	Pal Profit: - 8+5+10+15+9+4=51		
	- 1950년 2일 : 1870년 교육 - 1922년 1일 : 1950년 1일 : 1952년 1일 - 1952년 1월 : 1952년 1월 : 1952년 1월 : 1952년 1일		
	e lomplexity:-	154	
	Selection step Sorting		- 1941 - 12 - 12 y
	Selection step Sorting	1	
		No.	
1		i i	
~~~			
		w.A. C.	
		1	T. C.
	[P.T.0]		
	THE PROPERTY OF THE PARTY OF TH		14 A
		14-	
		7.37	
			11 11
-			
ST A MARKET		The state	
			- 1
			¥. ?1
		1	
		kee a	