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| A picture of a winding road and trees  algorithms | dr/ wael zakaria  12th project |

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Description:

Finding subsets involves generating all possible subsets of a given set. A subset is a collection of elements taken from the original set, where the order of the elements doesn't matter. For example, given the set {1, 2, 3}, some of its subsets would be {}, {1}, {2}, {1,2}, {3}, {1, 3}, {2, 3} , {1,2,3}

Algorithm:

# finding Subsets Complexity

for i <- 0 in elements do

for j<- 0 in subsets do

new\_subset <- j + [i]

new\_subsets.append(new\_subset)

subsets.extend(new\_subsets)

return subsets

Complexity : O(2^n)

# Enter elements in array

# n <- number of elements in array

for i <- 0 to n do

num <- number entered by user.

elements <- append the number entered by user to elements array.

= (n – 0 +1) \*1

= (n + 1) \*1

= (n + 1)

Complexity : O(n)

# Print all possible subsets.

for I <- to subsets do

print(i)

Complexity : O(n)

# FINDING ALL SUBSETS AND PRINT IT ALL

def FindAllSubsets(unique\_elements):

subsets = [[]]

for i in unique\_elements:

new\_subsets = []

for j in subsets:

new\_subset = j + [i]

new\_subsets.append(new\_subset)

subsets.extend(new\_subsets)

return subsets

n = int(input("Enter the number of elements: "))

elements = []

print("Enter the elements:")

for i in range(n):

num = int(input())

elements.append(num)

def remove\_duplicates(elements):

return list(set(elements))

unique\_elements = remove\_duplicates(elements)

print(unique\_elements)

subsets = find\_all\_subsets(elements)

print("All subsets:")

for i in subsets:

print(i)

print("The number of subsets = {}".format(len(subsets)))

finding subsets using python:

def FindAllSubsets(unique\_elements):

subsets = [[]]

for i in unique\_elements:

new\_subsets = []

for j in subsets:

new\_subset = j + [i]

new\_subsets.append(new\_subset)

subsets.extend(new\_subsets)

return subsets

n = int(input("Enter the number of elements: "))

elements = []

print("Enter the elements:")

for i in range(n):

num = int(input())

elements.append(num)

def remove\_duplicates(elements):

return list(set(elements))

unique\_elements = remove\_duplicates(elements)

print(unique\_elements)

subsets = FindAllSubsets(unique\_elements)

print("All subsets:")

for i in subsets:

print(i)

print("The number of subsets = {}".format(len(subsets)))