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BAHRIA UNIVERSITY,
(Karachi Campus)
Department of Software Engineering
Assignment #02– Spring 2022

COURSE TITLE: D&AA
Class: BSE 4
Course Instructor: ENGR. BUSHRA FAZAL KHAN
Max. Marks: 4 Points

COURSE CODE: CSC-321
Shift: Morning
Assignment Date: 24-May-2022
Assignment Due: 31-May-2022

Pseudo-code for backtracking algorithm of Sum of subset problem is given below. Explain the mechanism for given data

$n=4$, $W=13$, and $w_1=3$, $w_2=4$, $w_3=5$, $w_4=6$

► **Algorithm 5.4**

The Backtracking Algorithm for the Sum-of-Subsets Problem

Problem: Given n positive integers (weights) and a positive integer W , determine all combinations of the integers that sum to W .

Inputs: positive integer n , sorted (nondecreasing order) array of positive integers w indexed from 1 to n , and a positive integer W .

Outputs: all combinations of the integers that sum to W .

```
void sum_of_subsets (index i,
                    int weight; int total)
{
    if (promising(i))
        if (weight == W)
            cout << include[1] through include[i];
        else{
            include[i + 1] = "yes";           // Include  $w[i + 1]$ .
            sum_of_subsets(i + 1, weight + w[i + 1], total - w[i + 1]);
            include[i + 1] = "no";            // Do not include  $w[i + 1]$ .
            sum_of_subsets(i + 1, weight, total - w[i + 1]);
        }
}

bool promising (index i);
{
    return (weight + total >= W) && (weight == W || weight + w[i + 1] <= W);
}
```

Assignment # 2

31/May/22

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Solution:-

