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Experiment 14: Sum of Subset

```
#include<stdio.h>

int w[10]={0};
int n,s=0,sol[10]={0},tot_pl=0,count=0;

int promising(int l,int wsf,int tpl)//to check whether the node is promising
{
    if(wsf+w[l+1]<=s && wsf+tpl>=s)//check the required two conditions
    {
        return 1;
    }
    return 0;
}

void sum_of_subsets(int l,int wsf,int tpl)
{
    int i;
    if(wsf==s)
    {
        count++;
        printf("\nSolution Vector : %d",count);    //print the solution vector
        printf("\n");
        for(i=1;i<=n;i++)
        {
            printf("%d\t",sol[i]);
        }
        printf("\n");
    }
    else if(promising(l,wsf,tpl))//check whether the node is promising
    {
        sol[l+1]=1;
        sum_of_subsets(l+1,wsf+w[l+1],tpl-w[l+1]);
        sol[l+1]=0;
        sum_of_subsets(l+1,wsf,tpl-w[l+1]);
    }
}

int main()
{
    int i;
    printf("Enter the number of distinct items: ");//number of items
    scanf("%d",&n);
    printf("\n");
    for(i=1;i<=n;i++)
    {
        printf("Enter the weight of the Item Number %d: ",(i));//enter weight
```

```

        scanf("%d",&w[i]);
        tot_pl=tot_pl+w[i];    //Calculating total profit
    }
    printf("\nEnter the Maximum allowed weight : "); //maximum weight
    scanf("%d",&s);
    sum_of_subsets(0,0,tot_pl); // call to sum of subset method
    return 0;
}

```

Output:

```

C:\Users\dmell\OneDrive\Desktop\Subjects\AOA\SumofSubset.exe
Enter the number of distinct items: 5

Enter the weight of the Item Number 1: 2
Enter the weight of the Item Number 2: 7
Enter the weight of the Item Number 3: 8
Enter the weight of the Item Number 4: 9
Enter the weight of the Item Number 5: 15

Enter the Maximum allowed weight : 17

Solution Vector : 1
1      1      1      0      0

Solution Vector : 2
1      0      0      0      1

Solution Vector : 3
0      0      1      1      0

Process returned 0 (0x0)   execution time : 18.131 s
Press any key to continue.

```

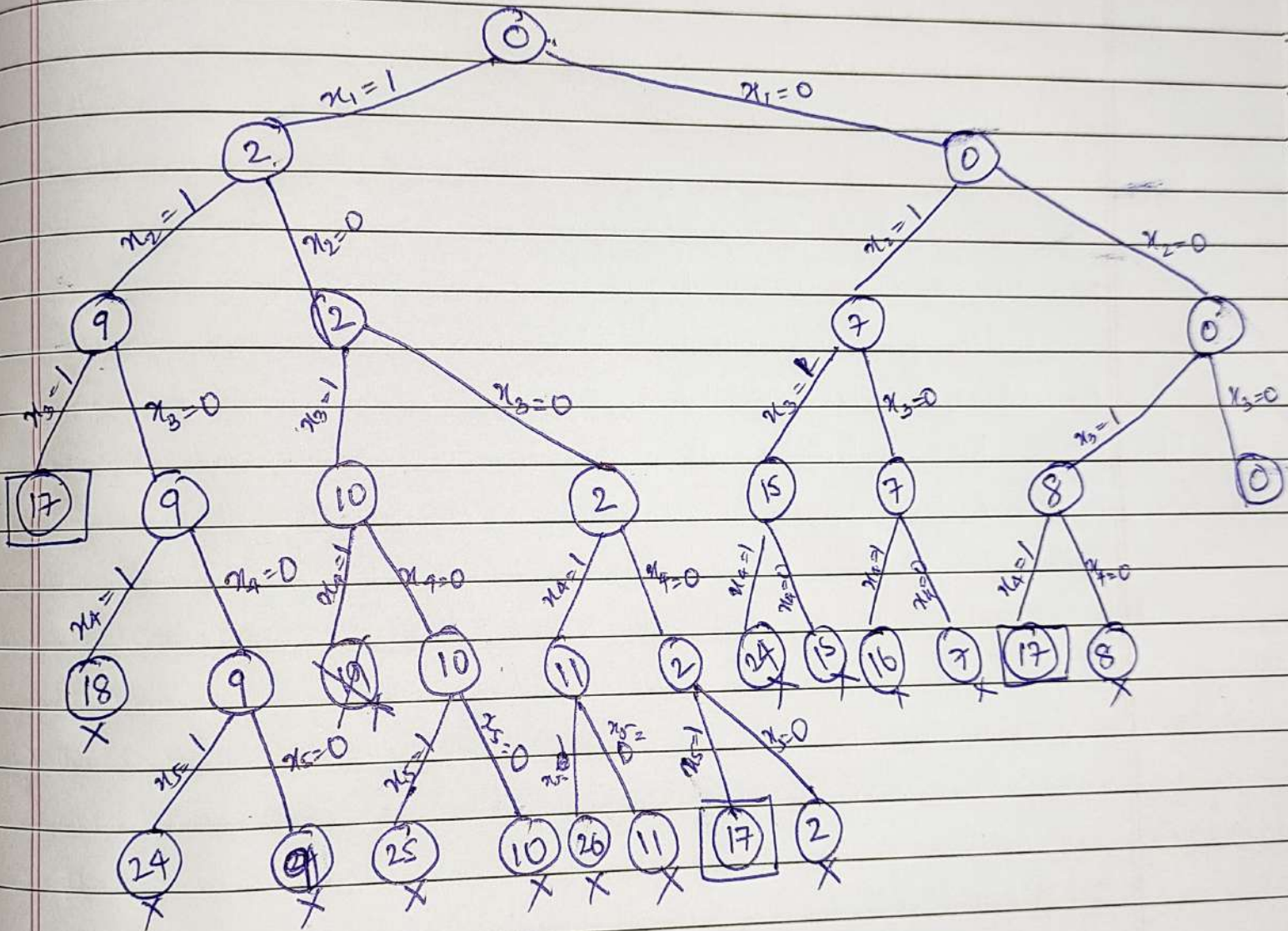
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Postlab

$$n = 5$$

$$W = \{2, 7, 8, 9, 15\}$$



∴ Solution Vector is

- ① (1 1 1 0 0)
- ② (1 0 0 0 1)
- ③ (0 0 1 1 0)