Experiment 6

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Branch: CSE **Section/Group:** 702 A
Semester: 5th **Date of Performance:** 29/09/2022
Subject Name: DAA Lab **Subject Code:** 20-CSP-312

1. Aim/Overview of the practical:

To implement subset-sum problem using Dynamic Programming.

2. Task to be done/ Which logistics used:

To write code to implement subset-sum problem using Dynamic Programming.

3. Algorithm/Flowchart (For programming based labs):

4. Steps for experiment/practical/Code:

```java
package com.DAA;

public class DAA_exp6 {


    static boolean isThereSubsetSum(int[] arr, int n, int sum) {
        boolean[][] dp = new boolean[n + 1][sum + 1];
        for (int i = 0; i <= n; i++)
            dp[i][0] = true;

        for (int i = 1; i <= sum; i++)
            dp[0][i] = false;

        for (int i = 1; i <= sum; i++) {
            for (int j = 1; j <= n; j++) {
                if (j < arr[i - 1])
                    dp[i][j] = dp[i - 1][j];
                if (j >= arr[i - 1])
                    dp[i][j] = dp[i - 1][j] ||
                            dp[i - 1][j - arr[i - 1]];
            }
        }
        return dp[n][sum];
    }
    public static void main(String[] args) {
        int [] ar={2,1,5,4,7,8,9};
        int n = ar.length;
        int sum= 7;
        if (isThereSubsetSum(ar, n, sum))
            System.out.println("Found a subset with given sum i.e "+sum);
        else
            System.out.println("No subset with given sum i.e "+sum);
    }
}
```

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5. Observations/Discussions/ Complexity Analysis:

Time complexity is O(N x sum).

6. Result/Output/Writing Summary:

```
Found a subset with given sum i.e 7
```

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Learning outcomes (What I have learnt):

1. Learnt about dynamic programming.

2. Learnt how to make optimal algorithm.

3. Learnt about subset sum problem using dynamic programming.

4. Learnt about the implementation of dynamic programming.

5.

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Evaluation Grid (To be created as per the SOP and Assessment guidelines by the faculty):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.			
2.			
3.			