

15. Find a subset of a given set $S = \{s_1, s_2, \dots, s_n\}$ of n positive integers whose sum is equal to a given positive integer d . For example, if $S = \{1, 2, 5, 6, 8\}$ and $d = 9$ there are two solutions $\{1, 2, 6\}$ and $\{1, 8\}$. A suitable message is to be displayed if the given problem instance doesn't have a solution.

```
#include<stdio.h>
int w[10],d,n,count,x[10],i;
void sum_of_subsets(int s,int k,int r)
{
    x[k]=1;
    if(s+w[k]==d)
    {
        printf("\nSubset %d=",++count);
        for(i=0;i<=k;i++)
            if(x[i])
                printf("%d\t",w[i]);
    }
    else if(s+w[k]+w[k+1]<=d)
        sum_of_subsets(s+w[k],k+1,r-w[k]);

    if((s+r-w[k]>=d) && ((s+w[k+1])<=d))
    {
        x[k]=0;
        sum_of_subsets(s,k+1,r-w[k]);
    }
}
void main()
{
    int sum=0,k;
    clrscr();
    printf("Enter the no of elements:");
    scanf("%d",&n);
    printf("Enter the elements in ascending order");
    for(i=0;i<n;i++)
        scanf("%d",&w[i]);
    printf("\nEnter the sum:");
    scanf("%d",&d);
    for(i=0;i<n;i++)
        x[i]=0;
    for(i=0;i<n;i++)
        sum=sum+w[i];
    if(sum<d || w[0]>d)
        printf("\n No subset possible");
    else
        sum_of_subsets(0,0,sum);
    if(count==0)
        printf("\n No subset possible");
    getch();
}
```

Output

```
Enter the no of elements:4
Enter the elements in ascending order? 11 13 24

Enter the sum:31

Subset 1=?      11      13
Subset 2=?      24      -
```