



Objective:

- The purpose of this quiz is to focus on the very basic fundamental concepts practiced so far in previous labs.

Question No 1:

(05)

Write a recursive version of the binary search function.

```
template<class T>
int binarySearch ( T * arr, int lb, int ub, T key )
```

KEY

Question No 2:

(10)

In Dickens's time, merchants measured many commodities using weights and a two-pan balance—a practice that continues in many parts of the world today. If you are using a limited set of weights, however, you can only measure certain quantities accurately.



For example, suppose that you have only two weights: a 1-ounce weight and a 3-ounce weight. With these you can easily measure out 4 ounces, as shown:



It is somewhat more interesting to discover that you can also measure out 2 ounces by shifting the 1-ounce weight to the other side, as follows:

Write a recursive function

bool isMeasurable (int target, int * weights, int N)

that determines whether it is possible to measure out the desired target amount with a given set of weights. The available weights are stored in the integer array 'weights'.

```
bool workHorseIsMeasurable(int target, int* weights, int index, int N)
{
    if (target == 0)
    {
        return true;
    }
    if (index >= N)
    {
        return false;
    }
    return (
        workHorseIsMeasurable(target+weights[index],weights,index + 1, N)
        || workHorseIsMeasurable(target, weights, index + 1, N)
        || workHorseIsMeasurable(target - weights[index], weights, index + 1, N)
    );
}

bool IsMeasurable(int target, int * weights, int N)
{
    return workHorseIsMeasurable(target, weights, 0, N);
}

int main()
{
    int weights[3]= {1, 2, 3};
    cout<<IsMeasurable(6, weights, 3);
    return 0;
}
```