```c
#include<stdio.h>
#include<math.h>
void BinPacking_NextFit(int weights[], int capacity, int n)
{
    int bin = 0;
    int remainingCapacity = capacity;
    for (int i = 0; i < n; i++)
    {
        if (weights[i] > remainingCapacity)
        {
            bin++;
            remainingCapacity = capacity - weights[i];
        }
        else
        {
            remainingCapacity -= weights[i];
        }
        if (remainingCapacity == 0 || i == n - 1)
        {
            bin++;
            remainingCapacity = capacity;
        }
    }
    printf("\nNext Fit Solution : %d", bin);
}

void BinPacking_FirstFit(int weights[], int capacity, int n)
{
    int bin=0, j;
    int remainingCapacity[n];
    for(int i=0; i<n; i++)
    {
        remainingCapacity[i] = capacity;
    }

    for(int i=0; i<n; i++)
    {
        for(j=0; j<bin; j++)
        {
            if(weights[i] <= remainingCapacity[j])
            {
                remainingCapacity[j] -= weights[i];
                break;
            }
        }
        if(j==bin)
        {
            remainingCapacity[bin] = capacity - weights[i];
            bin++;
        }
    }
    printf("\nFirst Fit Solution: %d",bin);

}

void BinPacking_BestFit(int weights[], int capacity, int n)
{
    int bin=0   , j;
    int remainingCapacity[n];

    for (int i = 0; i < n; i++)
    {
        remainingCapacity[i]=capacity;
    }

    for(int i=0; i<n; i++)
```

```
    {
        int minimum=capacity+1;
        int index=0;
        for(j=0; j<bin; j++)
        {
            if(weights[i] <= remainingCapacity[j] && remainingCapacity[j]-weights[i] <
minimum)
            {
                index=j;
                minimum = remainingCapacity[j]-weights[i];
            }
        }
        if(minimum==capacity+1)
        {
            remainingCapacity[bin] = capacity - weights[i];
            bin++;
        }
        else
        {
            remainingCapacity[index] -= weights[i];
        }
    }
    printf("\nBest Fit Solution: %d",bin);

}

void main()
{
    int n;
    int capacity;
    printf("BIN PACKING PROBLEM USING NEXT, FIRST AND BEST FIT\n\n");
    printf("Kindly enter the number of items: ");
    scanf("%d", &n);
    int weights[n];
    float totalWeight=0;
    for(int i=0; i<n; i++)
    {
        printf("Kindly enter the item %d: ",i+1);
        scanf("%d", &weights[i]);
        totalWeight += weights[i];
    }
    printf("\nKindly enter the maximum capacity of bin: ");
    scanf("%d", &capacity);
    int lowerBound = ceil(totalWeight/(float)capacity);
    printf("\nLower Bound(Min number of bins required): %d", lowerBound);
    printf("\nThe total number of bins required are as follows: ");
    BinPacking_NextFit(weights, capacity, n);
    BinPacking_FirstFit(weights, capacity, n);
    BinPacking_BestFit(weights, capacity, n);
    printf("\n");
}
```