Assignment Solutions | Greedy Algorithms | Week 20

1. Find the minimum number of fibonacci numbers whose sum is K [Leetcode 1414]

   Solution:

```
class Solution {
public:
    int findMinFibonacciNumbers(int k) {
        int c=1,c1=1;
        vector<int>v;
        while(c<=k){
            v.push_back(c);
            int t = c + c1 ;
            c1 = c;
            c = t;
        }
        int vnt = 0;
        int j = v.size() - 1 ;
        while(k){
            if(k-v[j]<0)j--;
            else {k-=v[j];vnt++;}
        }
        return vnt;
        return 0;
    }
};
```

2. K items with maximum sum [Leetcode 2600]

   Solution :

```
class Solution {
public:
    int kItemsWithMaximumSum(int numOnes, int numZeros, int numNegOnes, int k) {
            int total=0;

            int select=min(numOnes,k);       //selecting ones
           total+=select;                            //adding to sum
            k-=select;                                  // reducing k

            select=min(numZeros,k);          // selecting 0's if k is non zero
otherwise select will be 0
            k-=select;                                 // reducing k if k is non
zero

            select=min(numNegOnes,k);  // selecting -1's if k is non zero
otherwise select will be 0
            total-=select;                          //reducing the score by
select because we selected select no of -1's in case of k =0 we will reduce 0

            return total;
    }
};
```

3. Gas station [Leetcode 134]

   Solution:

```
class Solution {
public:
    int canCompleteCircuit(vector<int>& gas, vector<int>& cost) {
        int s1 = accumulate(gas.begin(),gas.end(),0);
        int s2 = accumulate(cost.begin(),cost.end(),0);

        if(s1<s2)return -1;
        int n = gas.size();
        int curr = 0;
        int start = 0;
        for(int i=0;i<n;i++){
            if(curr<0){
                curr = 0;
                start = i;
            }
            curr += gas[i]-cost[i];
        }
        return start;
    }
};
```

4. Make array zero by subtracting equal amounts [Leetcode 2357]

   Solution :

```cpp
class Solution {
public:
    int minimumOperations(vector<int>& a) {
        int n = a.size();
        unordered_set<int>s;

        for(auto x:a){
            if(x)s.insert(x);
        }
        return (int)s.size();
    }
};
```