RGUKT NUMBER

It can be proved that if n is not a rgukt number,
It will finally goto a
$4 \rightarrow 16 \rightarrow 37 \rightarrow 58 \rightarrow 89 \rightarrow 145 \rightarrow 42 \rightarrow 20 \rightarrow 4$ loop.
so just consider if go to one of these number, it will be not rgukt number, otherwise, it will finally stop at 1

solution in c++:

```
#inlcude<bits/stdc++.h>
using namespace std ;


int main(){
int n;
cin>>n;
set<int>s;
int sum=0;
while(s.find(n)==s.end()){
s.insert(n);
int rem=0;
sum=0;
while(n>0){
rem=n%10;
sum=sum+(rem*rem);
n=n/10;
}
if(sum==1) break;
else n=sum;
}
if(sum==1) cout<<"YES"<<endl;
else cout<<"NO"<<endl;
}
```

solution in c:

/isRGUKTNUMBER() will determine whether a number is happy or not

```
int isRguktNumber(int num){
    int rem = 0, sum = 0;

    //Calculates the sum of squares of digits
    while(num > 0){
        rem = num%10;
        sum = sum + (rem*rem);
        num = num/10;
    }
    return sum;
}
```

```
int main()
{
    int num = 82;
    int result = num;

    while(result != 1 && result != 4){
        result = isRguktNumber(result);
    }

    //Rgukt number always ends with 1
    if(result == 1)
        printf(“YES”);
    //NOT Rgukt number ends in a cycle of repeating numbers which contains 4
    else if(result == 4)
        printf(“NO”);

    return 0;
}
```

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