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Assignment #01

Algorithmic Problem Solving and Python Basics

1. **A Happy Number is a number that eventually reaches 1 when replaced by the sum of the squares of its digits. For example, 19 is a happy number because 12 + 92 = 82, and 82 + 22 = 68, and 62 +82 = 100, and finally, 12 +02 +02 = 1.**

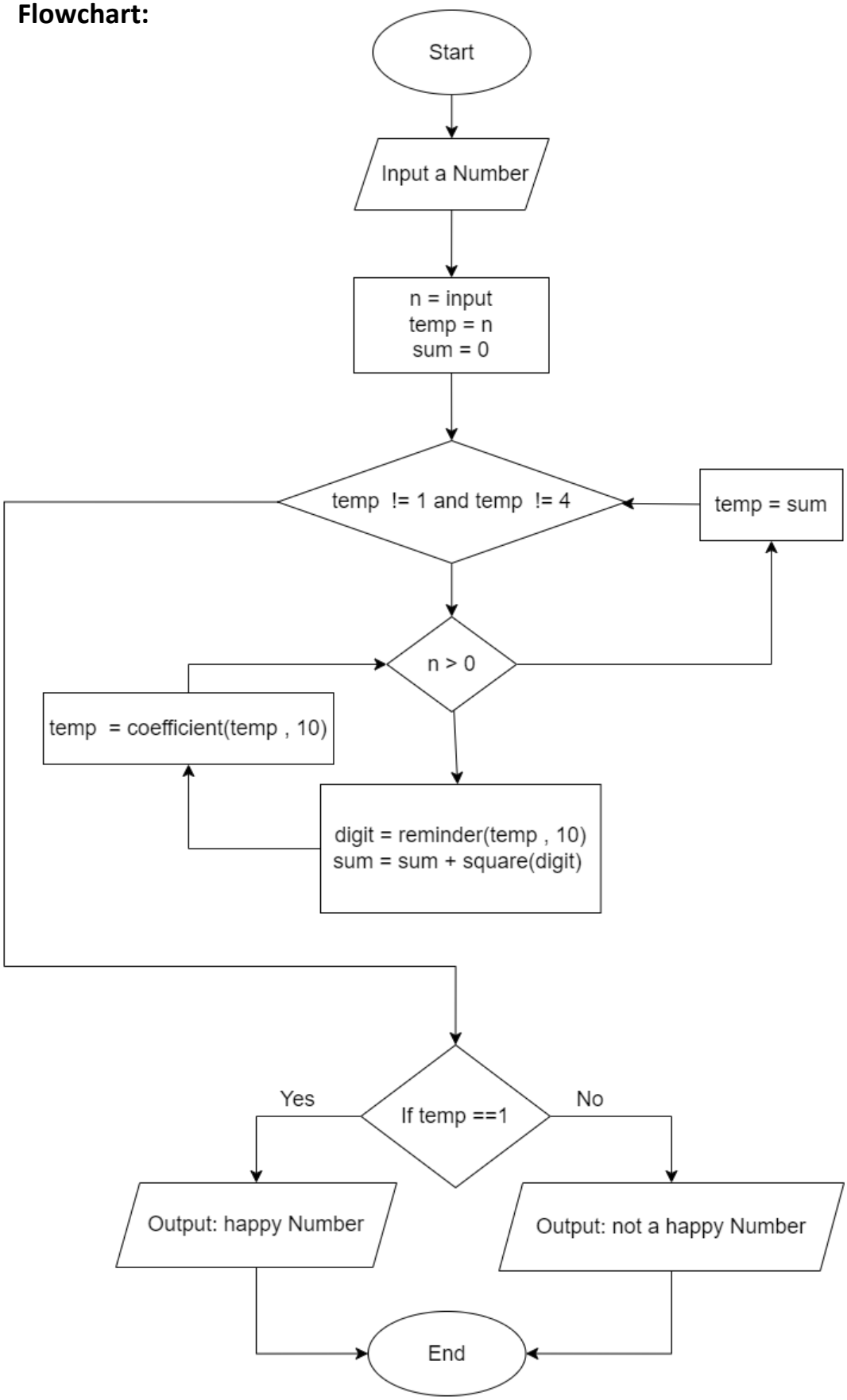
   Write the pseudocode and draw the flowchart for verifying whether a number is Happy Number or not?

   Pseudo code:

```
x ← input("Enter a number")
sum ← 0
n ← x
while n != 1 and n != 4:
    while n > 0:
        digit ← reminder(n, 10)
        n ← coefficient (n, 10)
        sum ← sum + square(digit)
    end
    n ← sum
    sum ← 0
end

if n = 1:
   output("Given number is a happy number")
else:
   output("Given number is not a happy number")
end
```

Flowchart:


Start
Input a Number
n = input
temp = n
sum = 0
temp != 1 and temp != 4
temp = sum
n > 0
temp = coefficient(temp , 10)
digit = reminder(temp , 10)
sum = sum + square(digit)
If temp ==1
Yes
No
Output: happy Number
Output: not a happy Number
End

2. **Write a Python program which prints the following pattern.**

```
******
*****
****
***
**
*
*
**
***
****
******
```

Code:

```python
n = int(input("Enter numbers of '*' at 1st line:"))

for i in range(n, 0, -1):
    for j in range(0,i):
        print("*", end="")
    print("\n")

for i in range(0,n+1):
    for j in range(0,i):
        print("*", end="")
    print("\n")
```

Output:

```
Enter numbers of '*' at 1st line:3
***

**

*


*

**

***
```

3. **Write a Python program, which takes a alphanumeric string as input from the user and outputs the string in which the charcater words only reverses. For example if the input is “1234abcd” then the out put should be “1234dcba” and if the input is “abcd1234” then the output is “dcba4321” and if the input is “ab12cde345fg6” then the output should be “ba21edc543gf6”.**

Code:

```python
n = input("Enter a string with numbers:")
str_lst = list(n)

main_str = []
temp_str = []

final_string = ""

for i in str_lst:
    if i.isalpha():
        temp_str.append(i)
    else:
        if len(temp_str) > 0:
            for j in range(len(temp_str)-1, -1, -1):
                main_str.append(temp_str[j])

            temp_str = []

        main_str.append(i)

for i in main_str:
    final_string += i

print(f'reverse of "{n}" is "{final_string}"')
```

Output:

```
Enter a string with numbers:soumya123deep456ganguly789


reverse of "soumya123deep456ganguly789" is "aymuos123peed456ylugnag789"
```