🧩 Problem Summary

Hercy saves money as follows:

- On **Monday**, he deposits $1.
- Each next day (Tue–Sun), he deposits $1 more than the previous day.
- Every next **Monday**, he starts with $1 more than the previous Monday.

Find the **total money** in the bank after **n days**.

🧮 Mathematical Concept Used → *Arithmetic Progression (AP)*

Each week forms an **AP (Arithmetic Progression)**:

> Monday to Sunday → difference = 1

Example week pattern:

Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Weekly To
1	1	2	3	4	5	6	7	28
2	2	3	4	5	6	7	8	35
3	3	4	5	6	7	8	9	42

📘 Formula Derivation

Let

- n = total number of days
- $w = n//7$ (full weeks)
- $d = n\%7$ (remaining days)

1️⃣ Total of full weeks:

Each week increases its base deposit by 1.

$$\text{Sum of full weeks} = 7 \times \frac{w(w-1)}{2} + 28w$$

2️⃣ Remaining days:

Start of next week deposit = $w + 1$

$$\text{Sum of remaining days} = d \times (w+1) + \frac{d(d-1)}{2}$$

3️⃣ Final Total:

$$\text{Total} = [7 \times \frac{w(w-1)}{2} + 28w] + [d \times (w+1) + \frac{d(d-1)}{2}]$$

💻 Python Code Implementation

```
class Solution(object): def totalMoney(self, n): """ :type n: int :rtype: int """ # Full weeks and remaining days
weeks = n // 7 days = n % 7 # Formula for full weeks total = 7 * weeks * (weeks - 1) // 2 + 28 * weeks # Add
remaining days total += days * (weeks + 1) + (days * (days - 1)) // 2 return total
```

📊 Example: n = 20

Week	Days Deposited	Deposits Each Day	Weekly Total
1	7	1, 2, 3, 4, 5, 6, 7	28
2	7	2, 3, 4, 5, 6, 7, 8	35

Week	Days Deposited	Deposits Each Day	Weekly Total
3	6	3, 4, 5, 6, 7, 8	33
Total	**20 days**		**96**

✅ **Output → 96**

🧠 Summary

Concept	Description
Type	Arithmetic Progression (AP)
Formula Used	$S_n = \frac{n}{2}(2a + (n-1)d)$
Math Operations	Division, modulus, summation
Time Complexity	O(1) (no loops)
Space Complexity	O(1)