

Expt 1:- Toy Problem.

(Camel Banana)

(Problem Formulation)

Theory:- A person has 3000 bananas and a camel. The person wants to transport the maximum no. of bananas to a destination which is 1000 kms away, using the only camel as a mode of transportation.

* The camel cannot carry more than 1000 bananas at a time and eats a banana every km it travels. We have to find the maximum no. of bananas that can be transferred to the destination.

Logic:- (Algorithm)

~~Source~~ ~~TP1~~ * Take the total bananas, distance and max. load capacity of camel.

* Take a variable loss for no. of bananas lost.

* Take another variable start and take an initial condition where $start = total$.

* Run a loop from 1 to range of total distance and take condition $start > 0$.

* Take $start = start - total_capacity$.

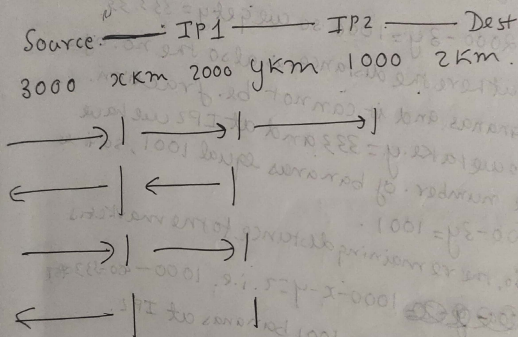
* Take condition $start == 1$ to check if camel does'nt move when it has 1 banana and decrement loss by 1.

* Now increment lose by 2 as for moving backward and forward by one mile two bananas will be lost

* In the last trip, decrement lose by 1 as camel will not travel backward, and assign
($\text{start} = \text{total} - \text{lose}$)

* If $\text{start} == 0$ break the loop and print start.

Solution:-



* To go from source to IP1 point camel has to take 5 trips (3 forward and 2 backward)

* To go from IP1 to IP2, camel has to take a total of 3 trips (2 forward and 1 backward)

* To IP3 to destination, only 1 forward

- * Source to IP1, $5x$ bananas and camel has 5 trips
- * IP1 to IP2, $3x$ bananas as x is distance and camel has 3 trips.
- * From IP2 to destination it has 2 bananas.

Calculation:-

1. $3000 - 5x = 2000$ so we get $x = 200$.
2. $2000 - 3y = 1000$ so we get $y = 333.33$.
but here the distance is also the no. of bananas and it cannot be fraction.
so we take $y = 333$ and at IP2 we have the number of bananas equal 1001, so it is $2000 - 3y = 1001$.
3. So, the remaining distance to the market is ~~1000~~ $1000 - x - y = 7$. i.e. $1000 - 200 - 333 = 467$.
4. Now, there are 1001 bananas at IP2.
5. So, from IP2 to the destination point camel ~~eat~~ eats 467 bananas. The remaining bananas are $1001 - 467 = 534$.
6. So, the maximum no. of bananas that can be transferred is 534.

```
1 total=int(input('Enter no. of bananas at starting'))
2 distance=int(input('Enter distance you want to cover'))
3 load_capacity=int(input('Enter max load capacity of your camel'))
4 lose=0
5 start_total
6 for i in range(distance):
7     while start>0:
8         start=start-load_capacity
9         if start<=0:
10             lose=lose+1
11             lose=lose*2
12             lose=lose-1
13             start=total-lose
14             if start<=0:
15                 break
16 print(start)
```

16:13 Python Spaces: 4

Run Command: CamelBanana.py Runner: Python 3 CWD ENV

```
1 class Graph:
2
3     def __init__(self, edges, N):
4         self.adj = [[] for _ in range(N)]
5         for (src, dest) in edges:
```

1:1 Python Spaces: 4

Run Command: CamelBanana.py Runner: Python 3 CWD ENV

Enter no. of bananas at starting 3000
Enter distance you want to cover 500
Enter max load capacity of your camel 600
572

Process exited with code: 0

Result:-

The Toy Problem was successfully implemented in Python