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Artificial Intelligence Lab

Lab-1 (B)

Aim: Implementation of Toy problem - 10 coins Puzzle

Problem Formulation:

To make two piles of coins each with same number of heads up where the given condition is such that there are 5 coins head up and 5 coins tail up but not which ones are which.

The coins can be flipped any number of times.

Initial State:- 

H	T	T	H	H	H	T	H	T	T
---	---	---	---	---	---	---	---	---	---

Final State:- 

P1	T	H	H	H	H
P2	H	H	H	H	T

Problem solving:

Make 2 piles with an equal number of coins.

Now, flip all the coins in one of the piles.

For Example:-

P1: H T T T T

P2: H H H H T

By flipping P1

P1: T H H H H

P2: H H H H T

∴ No. of heads in P1 = No. of heads in P2

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**EXPERIMENT NO: 1(B)**

**IMPLEMENTATION OF TOY PROBLEM**  
**(10 COINS PUZZLE)**

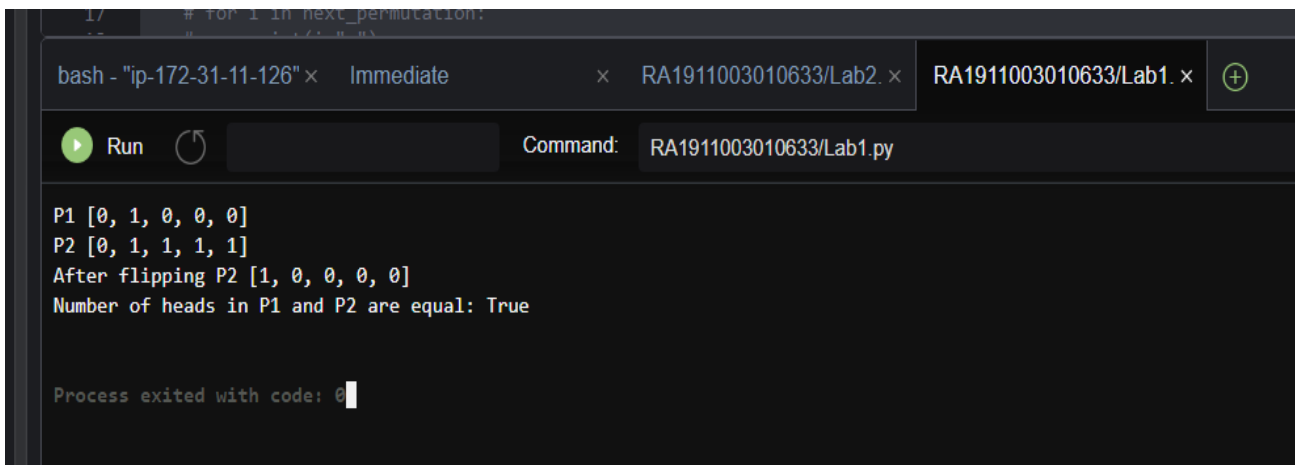
**Source code:**

```
#10 Coins puzzle
#1 represents head and 0 represents tail
import random
P1=[]
P2=[]
for i in range(5):
    P1.append(random.randint(0,1))
print("P1",P1)
count1=0;
count0=0;
for i in P1:
    if(i==0):
        count0=count0+1
    else:
        count1+=1
for i in range(5-count0):
    P2.append(0)
for i in range(5-count1):
    P2.append(1)
print("P2",P2)
for i in range(5):
```

```
    if P2[i]==0:
        P2[i]=1
    else:
        P2[i]=0
print("After flipping P2",P2)

cnt=0
for i in range(5):
    if P2[i]==0:
        cnt+=1
print("Number of heads in P1 and P2 are equal:", cnt==count0);
```

## **Output:**



```
17 # for i in next_permutation:
18     # flip P2
19     for i in range(5):
20         if P2[i]==0:
21             P2[i]=1
22         else:
23             P2[i]=0
24     print("After flipping P2",P2)
25
26 cnt=0
27 for i in range(5):
28     if P2[i]==0:
29         cnt+=1
30 print("Number of heads in P1 and P2 are equal:", cnt==count0);
```

bash - "ip-172-31-11-126" × Immediate × RA1911003010633/Lab2. × RA1911003010633/Lab1. × (+)

Run Command: RA1911003010633/Lab1.py

P1 [0, 1, 0, 0, 0]  
P2 [0, 1, 1, 1, 1]  
After flipping P2 [1, 0, 0, 0, 0]  
Number of heads in P1 and P2 are equal: True

Process exited with code: 0

## **Result:**

Hence, the implementation of 10 Coins Puzzle is done successfully.