Let us name the coins as,

1

2

3

4

5

6

7

8

1

2

3

Divide them into following groups,

G 3

G 2

G 1

6

8

7

5

4

Step1) Compare G1 and G2. **[comparison 1]**

Case 1:

* if G1 = G2, then the fake coin is present in G3. { i.e. all the coins in G1 G2 are genuine}
* Compare coin 1 and coin 7. **[comparison 2]**
* If coin 1 and 7 weigh the same, then coin 8 is the fake coin else **coin** **7 is the fake one**.

Case 2:

* If G1 > G2 then, the fake coin is in G2. { i.e. all the coins in G3 are genuine}
  + Compare coin 4 + coin 7 with coin 5 + coin 8. **[comparison 2]**
    - If they weigh the same , then **coin 6 is the fake coin**.
    - If (coin 4 + coin 7)> (coin 5 + coin 8) then **coin 5 is the fake coin** else **coin 4 is the fake coin.**

Case 3:

* If G1 < G2 then, the fake coin is in G1. { i.e. all the coins in G3 are genuine}
  + Compare coin 1 + coin 7 with coin 2 + coin 8. **[comparison 2]**
    - If they weigh the same , then **coin 3 is the fake coin**.
    - If (coin1 + coin 7)> (coin2 + coin 8) then **coin 2 is the fake coin** else **coin 1 is the fake coin.**

**SO WE NEED MINIMUM 2 COMPARISIONS TO DETECT THE FAKE COIN.**