

In[3]:= (*Part b*)

(*Defining constants here*)

```
s1 = 1403580; t1 = 810728; s2 = 527612; t2 = 1370589;  
m1 = 4294967087; m2 = 4294944443; m3 = 429496708;
```

(*Defining function below*)

```
MRG32k3a[seed_] :=  
(  
  p1 = Mod[(s1 * seed[[1]]) - (t1 * seed[[2]]), m1];  
  p2 = Mod[(s2 * seed[[4]]) - (t2 * seed[[5]]), m2];  
  z = Mod[(p1 - p2), m1];  
  If[z > 0, u = z/m3, If[z == 0, u = m1/m3]];  
  Return[{seed[[2]], seed[[3]], p1, seed[[5]], seed[[6]], p2}]  
);
```

(*An initial seed vector defined and a driver code is used to run the function 10000 times*)

```
seed = {1, 2, 3, 4, 5, 6};  
Table[seed = MRG32k3a[seed], {n, 1, 10000}][[10000]]  
{1156371316, 1793267613, 3404434831, 3847966625, 379397764, 2004902896}
```

```
MRG32k3a[{1, 2, 3, 4, 5, 6}]  
{2, 3, 4294749211, 5, 6, 4290201946}
```