Main_3

26 letters in the alphabet

This means that there can be 26×26 combinations of two letter first/ lastname initals.

NOTE: Aaron Bruce(AB) *and* Bruce Aaron (BA) are counted as two separate combinations.

$(10 \times (2 \times 26)) + (6 \times 26)$

$(10 \times 52) + (20 \times 6) + (6 \times 6)$

$(520) + (120 + 36)$

676 combinations of two letter initials

This means that if there were 677 people in a room, there would be two people present with the same two letter initials.

If *there are* 676 *pidgeons, 1 pidgeon will fit in 1 hole with no extra pidgeons.*

The pidgeion hole pricniple says that if there are $676 + 1$ *pidgeons at least 1 pidgeon hole will have to house 2 pidgeons.*

Now…imagine, right outside the room, we gather another 676 people, again with no 2 people having the same initials and all possible 2 letter initial combinations expended.

THEN we chuck this new group inside with the first group. We now have TWO(2) persons with matching two letter initals and all possible 2 letter initial combinations expended.

So we would have 2 AA's, 2 XC's, 2 QT's, 2 GG's.

Now we can scale this logic up $\times 3$.

Why don't we do this 4 more times…This would total 6 times.

To avoid all the logistical and organization challenges of getting this large group into a room, we just use math.

$676 \times 6 = (6 \times 600) + (6 \times 70) + (6 \times 6)$

$676 \times 6 = 3600 + 420 + 36$

$676 \times 6 = 4056$

So doing this 6 times will garner the result of 4056 people where; every 6 persons has matching 2 letter initials.

Now to guarantee that 7 people have matching initials we can just add 1 more person to the room with ANY initial and there will be 1 particular uppercase two letter initial that occurs 7 times.

For example I, Cam'ron Gloudon, walk into the room.

There is now 7 occurances of the initials CG.

$4056 + 1$

4057

✅ Answer: 4057 people