Scenarios

* Notation
  + *() contains a distribution of card counts*
  + *– separates runs from sets*
  + *, list of counts in same suit in ascending order*
  + *| list of counts in distinct suits (runs only)*

1. 1 Run
   1. All same suit: (10)
2. 2 Runs
   1. All same suit: (7,3), (6,4), (5,5), (4,6), (3,7)
   2. Two suits: (7|3), (6|4), (5|5)
3. 3 Runs
   1. All same suit: (4,3,3), (3,4,3), (3,3,4)
   2. Two suits: (4,3|3), (3,4|3), (3,3|4)
   3. Three suits: (4|3|3)
4. 1 Run / 1 Set
   1. Set does not include run suit: (7 – 3)
   2. Set does include run suit: (7low – 3), (7high – 3), (6low – 4), (6high – 4)
5. 2 Runs / 1 Set
   1. Runs are same suit, not included in set: (4,3–3), (3,4–3)
   2. Runs are same suit, included in set:
      * (4 low,3 low –3), (4 low,3 high –3), (4 high,3 high –3)
      * (3low,4 low –3), (3 low,4 high –3), (3 high,4 high –3)
      * (3 low,3 low –4), (3 low,3 high –4), (3 high,3 high –4)
   3. Runs are different suits, first included in set:
      * (4low|3–3), (4high|3–3), (3low|4–3), (3high|4–3)
   4. Runs are different suits, both included in set:
      * (4low|3 low –3), (4high|3 low –3), (4low|3 high –3), (4high|3 high –3)
      * (3low|3 low –4), (3high|3 low –4), (3high|3 high –4)
6. 1 Run / 2 Sets
   1. Run suit not in either set: (4–3,3)
   2. Run suit included in one set *(\* indicates set that contains run suit)*
      * (4 low–3\*,3), (4 high–3\*,3), (4 low–3,3\*), (4 high–3,3\*)
      * (3 low–4,3), (3 high–4,3), (3 low–3,4), (3 high–3,4)
   3. Run suit included in both sets:
      * (4 low–3,3), (4 mid–3,3), (4 high–3,3), (3 low–4,3) , (3 mid–4,3), (3 high–4,3)
7. 3 Sets
   1. Suit is irrelevant: (4,3,3), (3,4,3), (3,3,4)

# Some Common Occurrences

A row with a single run of length n

**14-n configurations**

*(14 – n)* possible positions for only block

A row with two runs of lengths n and m

Let *N = n+m*

*(13 – N)* possible positions (k) for first block  *(using 1 based indexing)*

*(14 – N –k)* possible positions for the second block

Total Config

**N=10: 6, (3,3): 28, (3,4): 21 configurations**

A row of three runs

**4 configurations**

N must be 3 + 3 + 4 = 10

Extra space can appear in one of 4 places

A row of one run of length n + 1 set

*(13 – n)* possible positions (k) for first block

*(14 – n –k)* possible positions for the second block

Total Config

**7:21, 6:28, 5:36, 4:45, 3:55 configurations**

A row of one run of length n + 2 sets

*(12 – n)* possible positions (j) for first block

*(13 – n – j)* possible positions (k) for the second block

*(14 – n –j - k)* possible positions for the third block

See below

**3:165, 4:120 configurations**

A row of two runs of lengths n and m + 1 set (outside runs)

Let *N = n+m*

*(12-N)* possible positions (k) for first block

*(13-N-k)* possible positions (j) for the second block

*(14-N-j-k)*  possible positions for the final block

Total Config:

**(3,3): 56, (3,4): 35 configurations**

A row of two runs of lengths n and m + 1 set (inside)

Let *N = n+m*

*(13-N)* possible positions (k) for first block

*(14-N-k)* possible positions (j) for the second block

*(15-N-j-k)*  possible positions for the final block

Total Config:

**(3,3): 84, (3,4): 56 configurations**

# One Run 16

## All Same suit 16

4 config x 4 suits

# Two Runs 2490

## All same suit 120

6 config x 4 suits = 24

6 config x 4 suits = 24

6 config x 4 suits = 24

6 config x 4 suits = 24

6 config x 4 suits = 24

## Two suits 2370

(7 x 11 config) x (4 x 3 suits) = 924

(8 x 10 config) x (4 x 3 suits) = 960

( 9 x 9 config) x ( 4 x 3 / 2 suits) = 486

# Three Runs 23472

## All same suit 48

4 config x 4 suits = 16

4 config x 4 suits = 16

4 config x 4 suits = 16

## Two suits 8904

(21 x 11 config) x (4x3 suits) = 2772

(21 x 11 config) x (4x3 suits) = 2772

(28 x 10 config) x (4x3 suits) = 3360

## Three suits 14520

(10 x 11 x 11 config) x (4 x 3 x 2 / 2 suits) = 14520

# 1 Run / 1 Set 1092

## Set does not include run suit 364

\* 7 config x 13 ranks x 4 suits = 364

## Set does include run suit 728

21 config x (4x3 suits) = 252

21 config x (4x3 suits) = 252

28 config x 4 suits = 112

28 config x 4 suits = 112

# 2 Runs / 1 Set 40188

## Runs are same suit, not included in set 2184

\* 21 config x 13 ranks x 4 suits = 1092

\* 21 config x 13 ranks x 4 suits - 1092

## Runs are same suit, included in set: 3808

35 config x (4x3 suits) = 420

56 config x (4x3 suits) = 672

35 config x (4x3 suits) = 420

35 config x (4x3 suits) = 420

56 config x (4x3 suits) = 672

35 config x (4x3 suits) = 420

56 config x 4 suits = 224

84 config x 4 suits = 336

56 config x 4 suits = 224

## Runs are different suits, one included in set: 8360

11x45 config x 4 suit = 1980

11x45 config x 4 suit = 1980

\* 10x55 config x 4 suit = 2200

\* 10x55 config x 4 suit = 2200

## Runs are different suits, both included in set: 23652

330 config x (4x3x2 suits) = 7920

9 positions (j) for set

(j) positions for run of 4

(1+j) positions for run of 3

56 config x (4x3x2 suits) = 1344

6 positions (j) for set

(j) positions for run of 4

(7-j) positions for run of 3

56 config x (4x3x2 suits) = 1344

330 config x (4x3x2 suits) = 7920

385 config x (4x3/2 suits) = 2310

10 positions (j) for set

(j) positions for run of 4

(j) positions for run of 3

84 config x (4x3/2 suits) = 504

7 positions (j) for set

(j) positions for run of 4

(8-j) positions for run of 3

385 config x (4x3/2 suits) = 2310

# 1 Run / 2 Sets 41880

## Run suit not in either set 3120

\* 10 config x (13x12/2 rank) x 4 suits = 3120

## Run suit included in one set 18240

120 config x (4x3 suit) = 1440

8 positions (j) for first set

(j) positions for run

(9-j) positions for second set

\* 420 config x (4x3 suit) = 5040

9 positions (j) for first set

(10-j) positions for run

(13-j) positions for second set

\* 420 config x (4x3 suit) = 5040

(mirror image of prior case)

120 config x (4x3 suit) = 1440

(mirror image of first case)

165 config x 4 suit = 660

9 positions (j) for first set

(j) positions for run

(10-j) positions for second set

495 config x 4 suit = 1980

10 positions (j) for first set

(11-j) positions for run

(13-j) positions for second set

495 config x 4 suit = 1980

(mirror image of prior case)

165 config x 4 suit = 660

(mirror image of first 3-run case)

## Run suit included in both sets 20520

120 config x (4x3 suit) = 1440

120 config x (4x3 suit) = 1440

120 config x (4x3 suit) = 1440

120 config x (4x3 suit) = 1440

120 config x (4x3 suit) = 1440

120 config x (4x3 suit) = 1440

165 config x (4x3 suit) = 1980

165 config x (4x3 suit) = 1980

165 config x (4x3 suit) = 1980

165 config x (4x3 suit) = 1980

165 config x (4x3 suit) = 1980

165 config x (4x3 suit) = 1980

# 3 Sets 13728

## Suit is irrelevant 13728

286 config x (3 choices for S4) x (4x4 suit) = 13728

11 positions (j) for first set

(12-j) positions (k) for second

(13-j-k) positions for third set

Overcounting

The following scenarios can lead to overcounting

(4.1)

will also be counted as one of these

(5.1.1)

will also be counted as one of these

(5.1.2)

will also be counted as one of these

(5.3.3)

will also be counted as one of these

(5.3.4)

will also be counted as one of these

(6.1.1)

will also be counted as one of these

(6.2.2)

will also be counted as one of these

(6.2.3)

will also be counted as one of these