Chi square alignments

1) Spades 404
Hearts 420
Diamonds 400
clubs 376

total 1600

df : 4

$\frac{1600}{4} = 400$

observed	
404	400
420	400
400	400
376	400

$\frac{(404-400)^2}{404} = \frac{16}{404}$

$\frac{(420-400)^2}{400} = \frac{400}{420}$

$\frac{(400-400)^2}{400} = 0$

$\frac{(376-400)^2}{376} = \frac{(24)^2}{376}$

$\frac{(404-400)^2}{404}$

$\frac{(420-400)^2}{420}$

$\frac{(400-400)^2}{400}$

$\frac{(376-400)^2}{400}$

$= \left(\frac{4}{404}\right)^2 = \left(\frac{1}{101}\right)^2$

$= \left(\frac{20}{400}\right)^2 = \left(\frac{1}{21}\right)^2$

$= 0$

$= \left(\frac{24}{400}\right)^2 = \left(\frac{3}{50}\right)^2$

Chi - Square Assignments

$df = 4$

$\frac{1600}{4} = 400$

1)

Observed	Expected	
404	400	$\frac{(404-400)^2}{404} = 0.0396$
420	400	$\frac{(420-400)^2}{420} = 0.952$
400	400	0
376	400	$\frac{(376-400)^2}{376} = 1.531$

$= 2.5226$

Critical value : 7.82

We can accept

2) 2 jokers → 54 cards

? → 1622 = 60.07

$1622 \times 2 = 54 \times n$

$n = \frac{1622 \times 2}{54}$

Observed	Expected	
404	400	$\frac{(404-400)^2}{404} = 0.0396$
420	400	= 0.952
400	400	= 0
376	400	= 1.531
82	62	$\frac{(82-62)^2}{82} = \frac{400}{82}$

= 2.5226

= 4.87

11.3

Joker are included

2 jokers for 54 cards = $\frac{2}{54} = \frac{1}{27} = 0.037$

for 1622 cards = 1622×0.037

$x^2 = 11.3$

$Df = 4$

Criterion value = 9.49

Because 12.33 is above 9.49

Rejected

3) Given ratios

4 stripes : 3 spots : 9 mixed.

Df = Item - 1

Df = 2

Observed	Expected		
50	$\frac{4}{16} \times 176$ = 44	= 0.818
41	$\frac{3}{16} \times 176$ = 33	= 1.939
85	$\frac{9}{16} \times 176$ = 99	= 2.305

= 5.06

Critical value = 5.991

accepted

4)

observed	Expected	
193	186	$\frac{(193-186)^2}{186} = 0.016$
184	186	$\frac{(184-186)^2}{186} = 0.02$
556	559	$\frac{(556-559)^2}{559} = 0.26$
61	62	$\frac{(61-62)^2}{62} = 0.016$
994		0.312

9:3:3:1 rule of chromoson genetic.

$\frac{9}{16} = x/994 \Rightarrow x = \frac{9}{16} \times 994 = 559$

$3/16 = \frac{x}{994} \Rightarrow x = 3/16 \times 994 = 186$

$3/16 = x/994 \Rightarrow x = 3/16 \times 994 = 186$

$1/16 = x/994 \Rightarrow x = \frac{1}{16} \times 994 = 62$

df = 3

Zcritcal : 7.815

The genes are independ allows 9:3:3:1

$\frac{1100}{5} = 220$

3) observed

262	220	$\frac{(262-220)^2}{220} = 8.014$
234	220	$\frac{(234-220)^2}{220} = 0.89$
204	220	$\frac{(204-220)^2}{220} = 1.16$
190	220	$\frac{(190-220)^2}{220} = 4.09$
210	220	$\frac{(210-220)^2}{220} = 0.4545$

14.61

$\alpha = 0.05 = 11.5$

Calculated $14.61 > 11.5$

So Reject null