FISHER'S EXACT TEST

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CRITERIA:

- Both variables are dichotomous qualitative (2 X 2 table).
- Sample size of < 20.
- Sample size of 20 to < 40 but one of the cell has expected value of < 5.

$$\frac{(a+b)!\,(a+c)!\,(b+d)!\,(c+d)!}{N!\,a!\,b!\,c!\,d!}$$

Weird since you have to calculate for many tables, until one of the cell becomes 0, then total up all the p values.

Distribution of Underweight and Normal Weight for Taxi Drivers and Bus Drivers

	Underweight	Normal	Total
Bus Drivers	8	11	19
Taxi Drivers	3	11	14
Total	11	22	33

There is an association between the prevalence of underweight and the type of vehicle driven by the public vehicle drivers.

In this analysis, it is a 2 X 2 table, cells with an expected value < 5 (4.67) and small sample size, therefore the best type of analysis possible is **Fisher's Exact Test**.

- $$\frac{(a+b)!\,(a+c)!\,(b+d)!\,(c+d)!}{N!\,a!\,b!\,c!\,d!}$$

- $$p1 = \frac{19!\,14!\,11!\,22!}{33!\,8!\,11!\,3!\,11!}$$

$$= \frac{4.758 \times 10^{56}}{3.3471 \times 10^{57}} = 0.142$$

Step 2

☐ Create 3 more extreme tables by deducting 1 from the smallest value. Continue to do so till the cell becomes zero;

KB	N	
9	10	19
2	12	14
11	22	33

KB	N	
10	9	19
1	13	14
11	22	33

KB	N	
11	8	19
0	14	14
11	22	33

☐ p2 = 0.0434

p3 = 0.00668

p4 = 0.00039

- Total p = 0.142+0.0434+0.00668+0.00039
  = 0.19247

- This is the p value for single-tailed test. To make it the p value for 2 tailed, times the value with 2; p = 0.385.

- p is bigger than 0.05, therefore the null hypothesis is not rejected.

- There is no association between occupation and UW ;-)