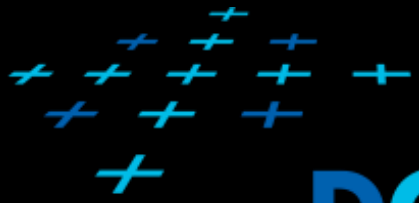


DCGI

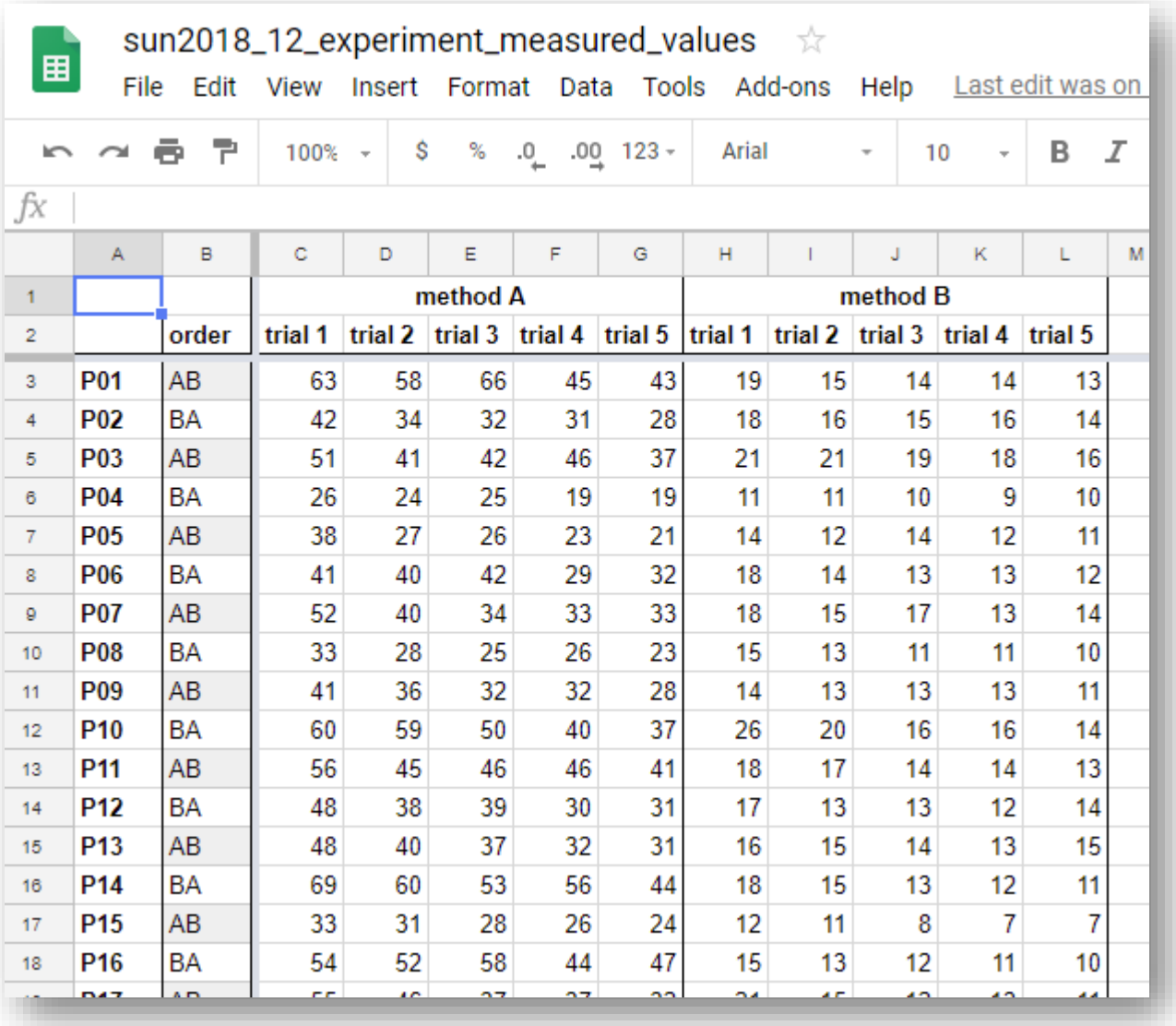
DEPARTMENT OF COMPUTER GRAPHICS AND INTERACTION
CZECH TECHNICAL UNIVERSITY IN PRAGUE

Experiment Evaluation and Power Analysis - PRACTICE

SAN 2018/19

EXPERIMENT RESULTS

https://bit.ly/2QyiUkK



sun2018_12_experiment_measured_values

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			method A					method B				
		order	trial 1	trial 2	trial 3	trial 4	trial 5	trial 1	trial 2	trial 3	trial 4	trial 5
P01	AB	63	58	66	45	43	19	15	14	14	13
P02	BA	42	34	32	31	28	18	16	15	16	14
P03	AB	51	41	42	46	37	21	21	19	18	16
P04	BA	26	24	25	19	19	11	11	10	9	10
P05	AB	38	27	26	23	21	14	12	14	12	11
P06	BA	41	40	42	29	32	18	14	13	13	12
P07	AB	52	40	34	33	33	18	15	17	13	14
P08	BA	33	28	25	26	23	15	13	11	11	10
P09	AB	41	36	32	32	28	14	13	13	13	11
P10	BA	60	59	50	40	37	26	20	16	16	14
P11	AB	56	45	46	46	41	18	17	14	14	13
P12	BA	48	38	39	30	31	17	13	13	12	14
P13	AB	48	40	37	32	31	16	15	14	13	15
P14	BA	69	60	53	56	44	18	15	13	12	11
P15	AB	33	31	28	26	24	12	11	8	7	7
P16	BA	54	52	58	44	47	15	13	12	11	10

POWER ANALYSIS | DISCOVERY

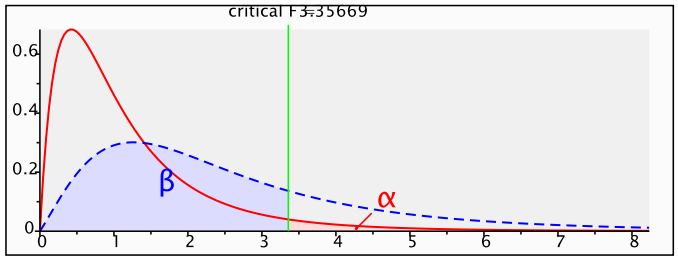
- To detect X % of problems that affects Y % of users.
- To have a X % chance of detecting …

$$n = \frac{\ln(1 - X)}{\ln(1 - Y)}$$

n = 60
chance (X) = 95 %
rareness = Y %

POWER ANALYSIS | COMPARING

F test (MANOVA: Repeated measures, within factors)

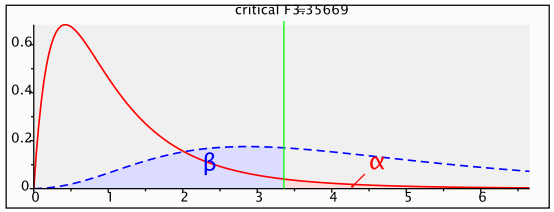


$\alpha = 0.05$

$\beta = 0.73$ for $\beta = 0.2, n = 44$

$f = 0.25$ (medium)

$n = 16$

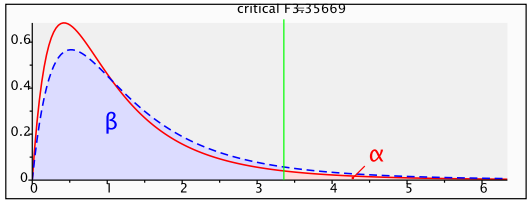


$\alpha = 0.05$

$\beta = 0.37$ for $\beta = 0.2, n = 22$

$f = 0.4$ (large)

$n = 16$



$\alpha = 0.05$

$\beta = 0.92$ for $\beta = 0.2, n = 244$

$f = 0.1$ (small)

$n = 16$

INSTRUCTIONS FOR 2ND PART

Analyze the data gathered on the 1st practice (see https://bit.ly/2QyiUkK). The report should contain:

- statistical analysis of data reporting
  - H_0/H_1 rejection/acceptance
  - group effect, asymmetric learning effect
  - learning curve across trials
    - compare learning curve of method A and B
    - how to determine number of trials when the method A will become faster than method B
- power analysis of the experiment setup
  - compute and discuss optimal parameters (power, effect size, α, n) for such study
- determine parameters of discovery experiment
  - n, X % chance of discovering problems affecting Y % of users

THANK YOU FOR ATTENTION

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