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1.(a) Sequence 1 is generated with permuted block randomization with block size 6.

(b) Describe different methods (sc bok/anteckningar)
Small numbers ($n \leq 30$) complete randomization does not give same numbers of patients in each group. When N is large, the sizes of the groups will be similar with high probability due to the low of large numbers. However, long sequences should be avoided for otherwise there is a high risk that e.g. all patients at one site can have same treatment.

2. Scenarios 2 and 4 give significant results. The result in 4 is very convincing since the estimate of the difference is high (6) and the confidence interval is away from zero [1, 11]. Scenarios 1 and 3 are non-significant but are very different in between, whereas the difference in 1 is very close to zero while in 3 it varies between -10 and 11. The result in 2, while statistically significant, might not be clinically relevant due to the small difference 0.9.

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3. Two arms A 132 surgery, B 102 drug — 234 in total
compared with respect to ulcer bleeds.
20 in A had a bleed before treatment and 2 in the drug group. 15 additional patients had a bleed in A and 15 in B.
Both per protocol (PP) and intention to treat (ITT) analysis where performed.
The main idea behind ITT is that "strange" things happen also in real life and therefore one should stick to the original intention of the study. ITT should in this case mean that 20 + 10 bleeds are kept in A and 2 + 15 in B. PP would mean that we exclude the 22 bleeds before treatment because these do not, strictly speaking, follow protocol.

4. E.g. ANCOVA where Y is response and X included as a covariate. Analysis can be with or without random effects (individual) i.e. PROC MIXED or PROC GLM in SAS.
Model: $Y_{ij} = \mu + \tau_i + \beta X_{ij} + \varepsilon_{ij}$

5. Solution based on exponential distribution.
Let λ_0 be the intensity for the old therapy and λ_n that of the new therapy. Calculate $\hat{\lambda}_0$ and $\hat{\lambda}_n$ from $e^{-\hat{\lambda}_0 2} = 0.25$ and $e^{-\hat{\lambda}_n 2} = 0.40$. Moreover use that $\hat{\lambda}_n = \hat{\lambda}_0 e^{\hat{\beta}}$ to calculate $\hat{\beta}$ and put in

6. We want to show that the 30 days treatment had an effect. To do that we need to show that the difference before/after is sign. different from zero. Can be done in different ways. One is to view it as a paired t-test: Taking all differences leads to a one sample test of $H_0: \mu = 0$. Sample size is low and we are not sure about normality so perhaps a non-parametric test would be better e.g. a sign test for paired data (number of posisive differences is $Bin(9, \frac{1}{2})$ under H_0.

7. Not applicable in this years version

8. 5 tests performed simultaneously at the $\alpha = 0.05$ level. Which ones should be accepted/rejected using Bonferroni, Holm, Hochberg

$P_{(i)}$	$N-i+1$	$\alpha/(N-i+1)$	α/N
0,004	5	0.01 *	0,01 *
0.082	4	0.0125 *	0.01 *
0.04	3	0.016	0,01
0,052	2	0.025	0.01
0.1	1	0.05	0,01

Holm/Hochberg

9.

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9. Contingency table

	GAD	NO GAD	Tot
Normal	90	90	180
Syndrom	185	185	370
Tot	275	275	550.

exp. values

	GAD	No GAD	Tot
Normal	55	125	180
Syndrom	220	150	370
Tot	275	2756	550

observed values

using formula $E_{ij} = \frac{T_i T_j}{N}$; E_{ij} = expected cell ij

T_i row i ; T_j column j. N = Grand total

$$\chi^2_P \sum_{i=1}^{2} \sum_{j=0}^{1} \frac{(Y_{ij} - m_{ij})^2}{m_{ij}} = \frac{(90-55)^2}{90} + \frac{(90-185)^2}{90} + \frac{(185-220)^2}{185} + \frac{(185-220)^2}{185}$$

$= 2.13.6 + 2.6.82 = 40,44 \quad (p < 0.00001)$

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