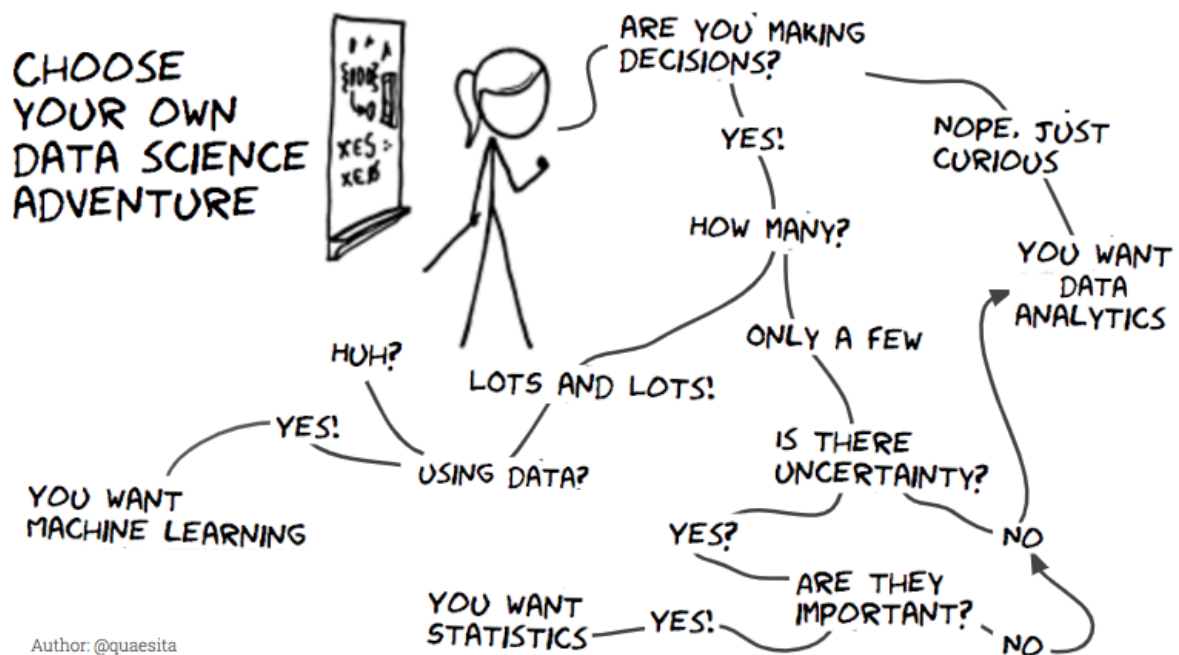**Problem sheet 5 :: choosing a statistical test**

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Questions

Seven questions, each worth one mark with three marks for attendance. For each, identify the independent and dependent variable, their types and choose the appropriate statistical test (only one for each question).

Q1. 20 participants were asked to write text using two different keyboard layouts (A and B). Half of the participants started the task on the A layout and then the B and the other half of the participants started the task on the B layout and then the A. The number of words typed per minute was collected for each participant and layout. Choose the most appropriate procedure to decide which layout allow participants to type the fastest. Assumption normality and homogeneity are verified.

Independent variable(s) and type	Dependent variable(s) and type	Statistical test (circle appropriate)	
		Paired T-test	Wilcoxon
		Unpaired T-test	Kruskal Wallis
		One-Way Anova (between)	Friedman
			Linear regression
		Repeated Anova (within)	Kolmogorov-Smirnov
		Mann Whitney	Shapiro-Wilk

Q2. 40 participants were randomized to two groups. One group received a drug to decrease hair loss and the other group received a placebo (a pill of sugar). At the end of the program, the percentage hair loss for each patient was recorded. Choose the most appropriate procedure to decide if there is a relationship between the use of the drug and the percentage of hair loss. Assumption normality and homogeneity are verified.

Independent variable(s) and type	Dependent variable(s) and type	Statistical test (circle appropriate)	
		Paired T-test	Wilcoxon
		Unpaired T-test	Kruskal Wallis
		One-Way Anova (between)	Friedman
			Linear regression
		Repeated Anova (within)	Kolmogorov-Smirnov
		Mann Whitney	Shapiro-Wilk

Q3. A study attempted to find out if the age of an animal had any relationship to their athletic ability. The researchers took the data of 104 cheetahs, calculating their age and running a test to measure their speed. Choose the most appropriate procedure to decide if the age has any relationship with the run speed.

Independent variable(s) and type	Dependent variable(s) and type	Statistical test (circle appropriate)	
		Paired T-test	Wilcoxon
		Unpaired T-test	Kruskal Wallis
		One-Way Anova (between)	Friedman
			Linear regression
		Repeated Anova (within)	Kolmogorov-Smirnov
		Mann Whitney	Shapiro-Wilk

Q4. 20 participants were asked to type of their phone touchscreen in four different postures (sitting, lying down, standing and running). The number of words typed per minute was collected for each participant and postures. Choose the most appropriate procedure to decide which posture allow participants to type the fastest. Assumption normality and homogeneity are verified.

Independent variable(s) and type	Dependent variable(s) and type	Statistical test (circle appropriate)	
		Paired T-test	Wilcoxon
		Unpaired T-test	Kruskal Wallis
		One-Way Anova (between)	Friedman
			Linear regression
		Repeated Anova (within)	Kolmogorov-Smirnov
		Mann Whitney	Shapiro-Wilk

Q5. 20 participants were asked to run as fast as possible using two different pairs of shoes. They tested both pairs of shoes and each time their speed was collected. Choose the most appropriate procedure to decide which shoes allow participants to run the fastest. Assumption normality is verified but not the assumption of homogeneity.

Independent variable(s) and type	Dependent variable(s) and type	Statistical test (circle appropriate)	
		Paired T-test	Wilcoxon
		Unpaired T-test	Kruskal Wallis
		One-Way Anova (between)	Friedman
			Linear regression
		Repeated Anova (within)	Kolmogorov-Smirnov
		Mann Whitney	Shapiro-Wilk

Q6. 20 participants were asked to type of their phone touchscreen in four different postures (sitting, lying down, standing and running). They were asked to rate their comfort for each posture using a Likert Scale questionnaire. Choose the most appropriate procedure to decide which posture was most comfortable.

Independent variable(s) and type	Dependent variable(s) and type	Statistical test (circle appropriate)	
		Paired T-test	Wilcoxon
		Unpaired T-test	Kruskal Wallis
		One-Way Anova (between)	Friedman
			Linear regression
		Repeated Anova (within)	Kolmogorov-Smirnov
		Mann Whitney	Shapiro-Wilk

Q7. A study has gathered 10000 observations of computer performances (speed) in three different room of varying temperature (15, 25 and 35 degrees Celsius). Choose the most appropriate procedure to decide if the data follows a normal distribution.

Independent variable(s) and type	Dependent variable(s) and type	Statistical test (circle appropriate)	
		Paired T-test	Wilcoxon
		Unpaired T-test	Kruskal Wallis
		One-Way Anova (between)	Friedman
			Linear regression
		Repeated Anova (within)	Kolmogorov-Smirnov
		Mann Whitney	Shapiro-Wilk

Useful