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NOTES FOR EXERCISES IN SESSION 2

- VER:14.2; add:2.2, 2.4, 2.7(Q1) (VER:14.1; add:2.1, 2.3)

Outline of lab session:

- (maybe) brief review of program file for VER:14.1 (Linear Regression, Exercise #1) from last Friday?
- brief Minitab 21 review (Henrik) — `daisy2red` data,
- (tentative time: 3:00) class discussion/review of VER:14.2,
- individual work/discussions on the exercises (with Stata, possibly also other packages, e.g. Minitab).

MINITAB BASICS

- start via Programs menu,
- simple recommendations:
 - * enable commands in Session window (Editor menu when in Session window),
 - * use/save separate project files (.mpx; includes results & graphs) for each assignment/project you work on.

Data sets and files for Minitab:

- .mwx, previously .mtw (worksheet, raw data),
- recommended format for transfer between software: .csv (comma-separated values) = data format for course.

Data transfer:

- import data into Minitab: Open... menu (several formats available),
- export data from Minitab: Save Worksheet As menu (several formats available),
- complex data transfer may use StatTransfer software (licensed, instructors have access),
- copy/paste of data between softwares:
 - * simple to do, but always check the “new” data,
 - * *not recommended* for real data management (because prone to errors and offers no documentation).

LINEAR (REGRESSION) MODELS IN MINITAB 21

Choices in the Stat-Regression menu:

- **Fitted Line Plot** — single continuous predictor: plot with limited regression statistics + prediction curves, log-transformation and quadratic/cubic regression,
- **Regression-Fit Regression Model** — multiple regression with continuous & categorical predictors:¹ full regression analysis, with SEs and VIFs, ANOVA table (incl. lack of fit test), table of “unusual” observations, residuals and diagnostics,
 - * submenu choices: Box-Cox analysis, stepwise model selection tools (later lecture), expanded tables (incl. CIs for β 's), coding of categorical variables,
 - * supplementary analysis choices: prediction, factorial plots (incl. interaction plots),
- **Regression-Best Subsets**: tool to guide model selection, produces overview of “best” models (no simple Stata equivalent).

Added features offered by General Linear Model interface¹:

- for categorical predictors: least squares means (later lecture; select in **Options** menu) and multiple comparisons,
- random effects (discussed later in VHM 802/812 courses).

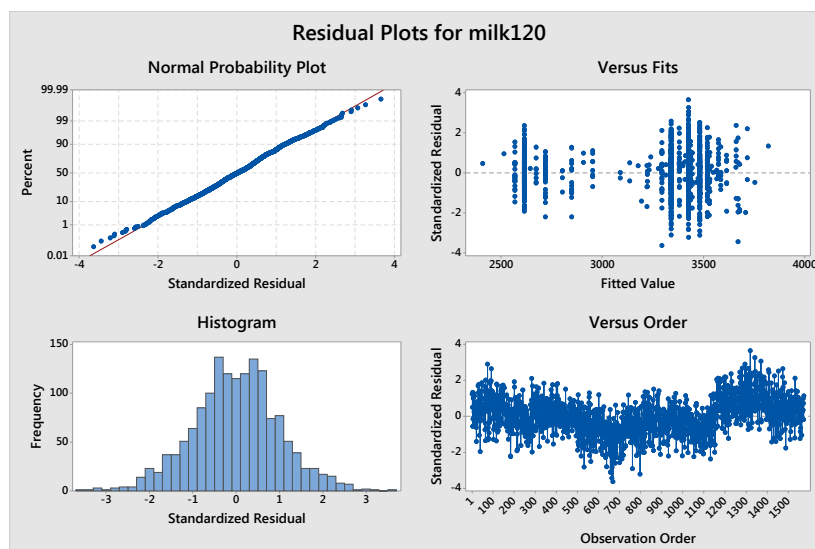
¹ A very similar interface is offered by **Stat-ANOVA-General Linear Model**.

LINEAR MODEL CHECKING IN MINITAB

Overview of features (both Regression and ANOVA menus):

- easy access to a set of residual graphs,
- residuals and diagnostics may be stored in worksheet,
- not as many additional tools (e.g. tests) as in Stata.

Example I: “Four in one” residual plots for milk120 model with predictors: parity (categorical), twin, dyst, rp, vag_disch:



Example II: Residual plots for wpc model from VER Example 14.12:

