

Mlfuns Sample Script

Parameter Table

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Tim Bergsma

1 Purpose

This script picks up after model.Rnw to process bootstrap results and make a parameter table.

1.1 Package

Listing 1:

```
> getwd()

[1] "/Users/timb/project/metrum/inst/sample/script"
```

Listing 2:

```
> require(MIfuns)

MIfuns 4.3.5
```

2 Parameter Table

Listing 3:

```
> library(Hmisc)
> tab <- wikitab(1005, '../nonmem')
> tab

  parameter              description
1  THETA1          apparent oral clearance
2  THETA2      central volume of distribution
3  THETA3      absorption rate constant
4  THETA4      intercompartmental clearance
5  THETA5      peripheral volume of distribution
```

```

6      THETA6          male effect on clearance
7      THETA7          weight effect on clearance
8      OMEGA1.1        interindividual variability of clearance
9      OMEGA2.2        interindividual variability of central volume
10     OMEGA3.3         interindividual variability of Ka
11     SIGMA1.1         proportional error

                                model tool run
1  CL/F (L/h) ~ theta_1 * theta_6 ^MALE * (WT/70)^theta_7 * e^eta_1 nm7 1005
2                                V_c /F (L) ~ theta_2 * (WT/70)^1 * e^eta_2 nm7 1005
3                                K_a (h^-1 ) ~ theta_3 * e^eta_3 nm7 1005
4                                Q/F (L/h) ~ theta_4 nm7 1005
5                                V_p /F (L) ~ theta_5 nm7 1005
6                                MALE_CL/F ~ theta_6 nm7 1005
7                                WT_CL/F ~ theta_7 nm7 1005
8                                IIV_CL/F ~ Omega_1.1 nm7 1005
9                                IIV_V_c /F ~ Omega_2.2 nm7 1005
10                               IIV_K_a ~ Omega_3.3 nm7 1005
11                               err_prop ~ Sigma_1.1 nm7 1005

estimate prse          se
1      8.57997 9.51 0.815572
2      21.6409 9.33 2.02017
3      0.0684281 8.04 0.005504
4      3.78411 13.5 0.510932
5      107.375 15.7 16.8257
6      0.998986 13.7 0.1364
7      1.67117 21.9 0.366424
8      0.195776 23.1 0.0451412
9      0.128574 30.4 0.0391464
10     0.106528 25.2 0.0268981
11     0.067111 11.4 0.0076591

```

Listing 4:

```

> tab$estimate <- as.character(signif(as.numeric(tab$estimate),3))
> tab$estimate <- with(tab, paste(estimate,'$',justUnits(model),'$'))

```

```

> tab$name <- with(tab, wiki2label(model))
> tab$root <- signif(sqrt(exp(text2decimal(tab$estimate))-1),3)*100
> needcv <- contains('OMEGA|SIGMA',tab$parameter)
> tab <- within(tab, estimate[needcv] <- paste(estimate[needcv],parens(glue('\%CV=',root[needcv])))
> tab$root <- NULL
> #offdiag <- contains('2.1',tab$parameter)
> #tab$estimate[offdiag] <- text2decimal(tab$estimate[offdiag])
> #omegablock <- text2decimal(tab$estimate[contains('Omega..(1|2)',tab$parameter)])
> #cor <- signif(half(cov2cor(as.matrix(as.halfmatrix(omegablock))))[[2]],3)
> #tab$estimate[offdiag] <- paste(sep=',',tab$estimate[offdiag], '(COR=',cor,')')
> tab$model[is.na(tab$model)] <- ''
> boot <- read.csv('../nonmem/1005.boot/log.csv',as.is=TRUE)
> boot <- boot[boot$moment=='estimate',]
> boot <- data.frame(cast(boot,... ~ moment))
> boot[] <- lapply(boot,as.character)
> boot <- boot[contains('THETA|OMEGA|SIGMA',boot$parameter),c('parameter','estimate')]
> boot$estimate <- as.numeric(boot$estimate)
> boot <- data.frame(cast(boot,parameter ~ .,value='estimate',fun=function(x)list(lo=as.character(signif(quantile(x,
  probs=0.05),3)),hi=as.character(signif(quantile(x,probs=0.95),3))))))
> boot$CI <- with(boot, parens(glue(lo,',',hi)))
> tab <- stableMerge(tab,boot[,c('parameter','CI')])
> tab <- within(tab, se <- name <- run <- tool <- parameter <- NULL)
> tab$model <- wiki2latex(noUnits(tab$model))
> tab

```

	description
1	apparent oral clearance
2	central volume of distribution
3	absorption rate constant
4	intercompartmental clearance
5	peripheral volume of distribution
6	male effect on clearance
7	weight effect on clearance
8	interindividual variability of clearance

9 interindividual variability of central volume
 10 interindividual variability of Ka
 11 proportional error

```

model
1 $\\mathrm{CL}/F \\sim \\theta_{1}\\cdot \\theta_{6}^{\\{MALE\\}}\\cdot (WT/70)^{\\theta_{7}}\\cdot e^{\\eta_{1}}$
2 $\\mathrm{V}_{c}/F \\sim \\theta_{2}\\cdot (WT/70)^{1}\\cdot e^{\\eta_{2}}$
3 $\\mathrm{K}_{a} \\sim \\theta_{3}\\cdot e^{\\eta_{3}}$
4 $\\mathrm{Q}/F \\sim \\theta_{4}$
5 $\\mathrm{V}_{p}/F \\sim \\theta_{5}$
6 $\\mathrm{MALE}_{CL/F}\\sim \\theta_{6}$
7 $\\mathrm{WT}_{CL/F}\\sim \\theta_{7}$
8 $\\mathrm{IIV}_{CL/F}\\sim \\Omega_{1.1}$
9 $\\mathrm{IIV}_{V_{c}/F}\\sim \\Omega_{2.2}$
10 $\\mathrm{IIV}_{K_{a}}\\sim \\Omega_{3.3}$
11 $\\mathrm{err}_{prop}\\sim \\Sigma_{1.1}$

estimate prse CI
1 8.58 $ L/h $ 9.51 (7.46,9.94)
2 21.6 $ L $ 9.33 (18.5,25.7)
3 0.0684 $ h^{-1} $ 8.04 (0.0602,0.0785)
4 3.78 $ L/h $ 13.5 (3.01,4.87)
5 107 $ L $ 15.7 (86.2,149)
6 0.999 $ $ 13.7 (0.775,1.29)
7 1.67 $ $ 21.9 (1,2.35)
8 0.196 $ $ (\\%CV=46.5) 23.1 (0.115,0.255)
9 0.129 $ $ (\\%CV=37.1) 30.4 (0.0641,0.184)
10 0.107 $ $ (\\%CV=33.6) 25.2 (0.0651,0.147)
11 0.0671 $ $ (\\%CV=26.3) 11.4 (0.0548,0.0803)
  
```

Table 1: Parameter Estimates from Population Pharmacokinetic Model Run 1005

description	model	estimate	prse	CI
apparent oral clearance	$CL/F \sim \theta_1 \cdot \theta_6^{MALE} \cdot (WT/70)^{\theta_7} \cdot e^{\eta_1}$	8.58 L/h	9.51	(7.46,9.94)
central volume of distribution	$V_c/F \sim \theta_2 \cdot (WT/70)^1 \cdot e^{\eta_2}$	21.6 L	9.33	(18.5,25.7)
absorption rate constant	$K_a \sim \theta_3 \cdot e^{\eta_3}$	0.0684 h ⁻¹	8.04	(0.0602,0.0785)
intercompartmental clearance	$Q/F \sim \theta_4$	3.78 L/h	13.5	(3.01,4.87)
peripheral volume of distribution	$V_p/F \sim \theta_5$	107 L	15.7	(86.2,149)
male effect on clearance	$MALE_{CL/F} \sim \theta_6$	0.999	13.7	(0.775,1.29)
weight effect on clearance	$WT_{CL/F} \sim \theta_7$	1.67	21.9	(1,2.35)
interindividual variability of clearance	$\Pi V_{CL/F} \sim \Omega_{1.1}$	0.196 (%CV=46.5)	23.1	(0.115,0.255)
interindividual variability of central volume	$\Pi V_{V_c/F} \sim \Omega_{2.2}$	0.129 (%CV=37.1)	30.4	(0.0641,0.184)
interindividual variability of Ka	$\Pi V_{K_a} \sim \Omega_{3.3}$	0.107 (%CV=33.6)	25.2	(0.0651,0.147)
proportional error	$err_{prop} \sim \Sigma_{1.1}$	0.0671 (%CV=26.3)	11.4	(0.0548,0.0803)