

Mlfuns Sample Script

Parameter Table

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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/code/inst/sample/script"
```

Listing 2:

```
> require(MIfuns, lib.loc='~/Rlibs')

MIfuns 4.3.4
```

2 Parameter Table

Listing 3:

```
> library(Hmisc)
> tab <- wikipab(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$name <- with(tab, nospace(nospace(lhs(model))))
> tab$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(nospace(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  $\mathrm{CL}/F \sim \theta_1 \cdot \theta_6^{\mathrm{MALE}} \cdot (WT/70)^{\theta_7} \cdot e^{\eta_1}$
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 | $IIV_{CL/F} \sim \Omega_{1.1}$ | 0.196 (%CV=46.5) | 23.1 | (0.115,0.255) |
| interindividual variability of central volume | $IIV_{V_c/F} \sim \Omega_{2.2}$ | 0.129 (%CV=37.1) | 30.4 | (0.0641,0.184) |
| interindividual variability of Ka | $IIV_{K_a} \sim \Omega_{3.3}$ | 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) |