Example code of the full model in NONMEM:

$PROBLEM Full BsAb TMDD Model

$INPUT ID TIME DV AMT CMT EVID MDV

$DATA data\_Full\_SC\_Peri\_single.csv IGNORE=#

; $DATA data\_Full\_SC\_Peri\_multiple.csv IGNORE=#

; $DATA data\_Full\_IVbolus\_noPeri\_single.csv IGNORE=#

; $DATA data\_Full\_IVbolus\_noPeri\_multiple.csv IGNORE=#

$SUBROUTINE ADVAN13 TOL=9

$MODEL NCOMP=8

$PK

TVkel = THETA(1)

kel = TVkel\*EXP(ETA(1))

TVkon1 = THETA(2)

kon1 = TVkon1\*EXP(ETA(2))

TVkoff1 = THETA(3)

koff1 = TVkoff1\*EXP(ETA(3))

TVkon2 = THETA(4)

kon2 = TVkon2\*EXP(ETA(4))

TVkoff2 = THETA(5)

koff2 = TVkoff2\*EXP(ETA(5))

TVkon3 = THETA(6)

kon3 = TVkon3\*EXP(ETA(6))

TVkoff3 = THETA(7)

koff3 = TVkoff3\*EXP(ETA(7))

TVkon4 = THETA(8)

kon4 = TVkon4\*EXP(ETA(8))

TVkoff4 = THETA(9)

koff4 = TVkoff4\*EXP(ETA(9))

TVksynA = THETA(10)

ksynA = TVksynA\*EXP(ETA(10))

TVkdegA = THETA(11)

kdegA = TVkdegA\*EXP(ETA(11))

TVksynB = THETA(12)

ksynB = TVksynB\*EXP(ETA(12))

TVkdegB = THETA(13)

kdegB = TVkdegB\*EXP(ETA(13))

TVkintA = THETA(14)

kintA = TVkintA\*EXP(ETA(14))

TVkintB = THETA(15)

kintB = TVkintB\*EXP(ETA(15))

TVkintAB = THETA(16)

kintAB = TVkintAB\*EXP(ETA(16))

TVk12 = THETA(17)

k12 = TVk12\*EXP(ETA(17))

TVk21 = THETA(18)

k21 = TVk21\*EXP(ETA(18))

TVka = THETA(19)

ka = TVka\*EXP(ETA(19))

TVVC = THETA(20)

VC = TVVC\*EXP(ETA(20))

bioSC = THETA(21)

F1 = 1/VC

F8 = bioSC

; Initial conditions

A\_0(1) = 0

A\_0(2) = ksynA/kdegA

A\_0(3) = ksynB/kdegB

A\_0(4) = 0

A\_0(5) = 0

A\_0(6) = 0

A\_0(7) = 0

A\_0(8) = 0

$DES

DADT(1) = -kel\*A(1) - kon1\*A(1)\*A(2) + koff1\*A(4) - kon2\*A(1)\*A(3) + koff2\*A(5) - k12\*A(1) + k21\*A(7)/VC + ka\*A(8)/VC

DADT(2) = ksynA - kdegA\*A(2) - kon1\*A(1)\*A(2) + koff1\*A(4) - kon4\*A(2)\*A(5) + koff4\*A(6)

DADT(3) = ksynB - kdegB\*A(3) - kon2\*A(1)\*A(3) + koff2\*A(5) - kon3\*A(3)\*A(4) + koff3\*A(6)

DADT(4) = kon1\*A(1)\*A(2) - (koff1+kintA)\*A(4) - kon3\*A(3)\*A(4) + koff3\*A(6)

DADT(5) = kon2\*A(1)\*A(3) - (koff2+kintB)\*A(5) - kon4\*A(2)\*A(5) + koff4\*A(6)

DADT(6) = kon4\*A(2)\*A(5) + kon3\*A(3)\*A(4) - (koff3+koff4+kintAB)\*A(6)

DADT(7) = k12\*A(1)\*VC - k21\*A(7)

DADT(8) = -ka\*A(8)

$ERROR

IPRED = A(1)+1e-12

IRES = DV-IPRED

W = SQRT((THETA(23)\*IPRED)\*\*2+THETA(22)\*\*2)

IWRES = IRES/W

Y = IPRED+W\*ERR(1)

$THETA

0.1 FIX ; 1 kel

10 FIX ; 2 kon1

0.01 FIX ; 3 koff1

1 FIX ; 4 kon2

0.01 FIX ; 5 koff2

1 FIX ; 6 kon3

0.01 FIX ; 7 koff3

10 FIX ; 8 kon4

0.01 FIX ; 9 koff4

1 FIX ; 10 ksynA

0.1 FIX ; 11 kdegA

10 FIX ; 12 ksynB

0.1 FIX ; 13 kdegB

0.05 FIX ; 14 kintA

0.05 FIX ; 15 kintB

0.1 FIX ; 16 kintAB

0.1 FIX ; 17 k12 no peripheral = 0, with peripheral = 0.1

0.03 FIX ; 18 k21

0.2 FIX ; 19 ka

3 FIX ; 20 V

0.75 FIX ; 21 f SC

0 FIX ; 22 Err add

1 FIX ; 23 Err prop

$OMEGA

0 FIX ; 1

0 FIX ; 2

0 FIX ; 3

0 FIX ; 4

0 FIX ; 5

0 FIX ; 6

0 FIX ; 7

0 FIX ; 8

0 FIX ; 9

0 FIX ; 10

0 FIX ; 11

0 FIX ; 12

0 FIX ; 13

0 FIX ; 14

0 FIX ; 15

0 FIX ; 16

0 FIX ; 17

0 FIX ; 18

0 FIX ; 19

0 FIX ; 20

$SIGMA

1 FIX

; $ESTIMATION METHOD=1 INTER NOABORT MAXEVAL=9999 PRINT=1 NSIG=3 SIGL=9

; $COV UNCONDITIONAL

$TABLE ID TIME DV AMT CMT EVID MDV IPRED IRES IWRES NOPRINT ONEHEADER FILE=sdtab