# Analysis of a simple normal model

# Important note: the code listed here has some
# deliberate errors in it, so that we can illustrate
# OpenBugs’s error messages.

model {

    # Likelihood:
    for(i in 1:50) {
        RA[i] ~ dnorm(mu, precision)
    }

    # Prior belief about mean Raven:
    mu ~ N(30, 1/4)

    # Prior belief about precision:
    precision ~ gamma(.001,.001)

    # Let’s look at standard deviation:
    sd <- sqrt(1/precision)
}

data
list(RA = c(35, 25, 23, 14, 34, 34, 24, 23, 33, 42,
            32, 45, 25, 33, 18, 40, 24, 20, 24, 20, 33,
            21, 43, 49, 21, 26, 30, 22, 34, 11, 39,
            27, 29, 28, 43, 45, 14, 30, 25, 20, 46,
            22, 35, 24, 41, 18, 9, 35, 37, 32, 15))

#initialization values
list( mu= 30, precision = 1/3)
# Here is the corrected code:
model {

  # Likelihood:
  for(i in 1:50) {
    RA[i] ~ dnorm(mu, precision)
  }

  # Prior belief about mean Raven:
  mu ~ dnorm(30, .25)  #mu ~ N(30, 1/4)

  # Prior belief about precision:
  # precision ~ gamma(.001,.001)
  precision ~ dgamma(.001,.001)

  # Let's look at standard deviation:
  sd <- sqrt(1/precision)
}

data
list(RA = c(35, 25, 23, 14, 34, 34, 24, 23, 33, 42,
           32, 45, 25, 33, 18, 40, 20, 24, 20, 33,
           21, 43, 49, 21, 26, 30, 22, 34, 11, 39,
           27, 29, 28, 43, 45, 14, 30, 25, 20, 46,
           22, 35, 24, 41, 18, 9, 35, 37, 32, 15))

#initialization values
# list( mu= 30, precision = 1/3)
list( mu= 30, precision = .333333333333333333)
# Analysis of a simple regression model

# Vague prior:
# Here is the corrected code:
model {

  # Likelihood:
  for(i in 1:50) {
    RA[i] ~ dnorm(mu[i], precision)
  }

  # Prior belief about mean Raven:
  for(i in 1:50) {
    mu[i] <- a + b*PB[i]
  }

  # Prior belief about precision:
  precision ~ dgamma(.001,.001)

  # Priors for a and b
  a ~ dnorm(0,.00001)
  b ~ dnorm(0,.00001)

  # Let’s look at standard deviation:
  sd <- sqrt(1/precision)
}

#data
list(RA = c(35, 25, 23, 14, 34, 34, 24, 23, 33, 42, 32, 45, 25, 33, 18, 40, 20, 24, 20, 33, 21, 43, 49, 21, 26, 30, 22, 34, 11, 39, 27, 29, 28, 43, 45, 14, 30, 25, 20, 46, 22, 35, 41, 18, 9, 35, 37, 32, 15),
      PB = c(77, 76, 81, 65, 83, 76, 81, 73, 81, 92, 75, 76, 69, 81, 81, 87, 63, 71, 86, 82, 69, 77, 92, 61, 75, 91, 65, 82, 80, 72, 81, 82, 76, 99, 90, 62, 76, 67, 80, 78, 63, 85, 84, 81, 70, 55, 93, 71, 80, 65))
#initialization values
list( a = 10, b = 1, precision = .333333333)