Text S1. Fixer.py custom script that recodes genotypes from JoinMap family type CP for analysis as a phase known 4-way cross in R/qtl.

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#Nov, 2011

import sys

if (len(sys.argv) !=3):

 sys.exit("You did not pass the correct arguments: fixer.py infile outfile")

else:

 in\_handle = sys.argv[1]

 out\_handle = sys.argv[2]

#Always write the first two lines

inputFile = open(in\_handle, 'rU')

outputFile = open(out\_handle, 'w')

line = inputFile.readline()

outputFile.write(line)

line = inputFile.readline()

outputFile.write(line)

outString = ""

#Loop through to the end of the inputFile

while True:

 line = inputFile.readline().strip()

 if(line == ""):

 break

 line = line.split('(')[0]+ line.split(')')[1]

 lineSplit = line.split(",")

 x = 5

 #Loop through the elements from this line

 while x < len(lineSplit):

 if ((lineSplit[3] == "{0-}")):

 if(lineSplit[x] == "ll"):

 lineSplit[x] = 5

 elif(lineSplit[x] == "lm"):

 lineSplit[x] = 6

 elif(lineSplit[3] == "{1-}"):

 if(lineSplit[x] == 'lm'):

 lineSplit[x] = 5

 elif(lineSplit[x] =='ll'):

 lineSplit[x] = 6

 elif(lineSplit[3] == "{-0}"):

 if(lineSplit[x] == 'nn'):

 lineSplit[x] = 7

 elif(lineSplit[x] == 'np'):

 lineSplit[x] = 8

 elif(lineSplit[3] == "{-1}"):

 if(lineSplit[x] == 'np'):

 lineSplit[x] = 7

 elif(lineSplit[x] == 'nn'):

 lineSplit[x] = 8

 elif(lineSplit[3] == "{00}"):

 if(lineSplit[x] == 'ee'):

 lineSplit[x] = 1

 elif(lineSplit[x] == 'ef'):

 lineSplit[x] = 2

 elif(lineSplit[x] == 'eg'):

 lineSplit[x] = 3

 elif(lineSplit[x] == 'fg'):

 lineSplit[x] =4

 elif(lineSplit[x] == 'hh'):

 lineSplit[x] = 1

 elif(lineSplit[x] == 'hk'):

 lineSplit[x] = 10

 elif(lineSplit[3] == "{10}"):

 if(lineSplit[x] == 'ef'):

 lineSplit[x] = 1

 elif(lineSplit[x] == 'ee'):

 lineSplit[x] = 2

 elif(lineSplit[x] == 'fg'):

 lineSplit[x] = 3

 elif(lineSplit[x] == 'eg'):

 lineSplit[x] = 4

 elif(lineSplit[x] == 'hk'):

 lineSplit[x] = 9

 elif(lineSplit[x] == 'hh'):

 lineSplit[x] = 2

 elif(lineSplit[3] == "{01}"):

 if(lineSplit[x] == 'eg'):

 lineSplit[x] = 1

 elif(lineSplit[x] == 'fg'):

 lineSplit[x] = 2

 elif(lineSplit[x] == 'ee'):

 lineSplit[x] = 3

 elif(lineSplit[x] == 'ef'):

 lineSplit[x] = 4

 elif(lineSplit[x] == 'hk'):

 lineSplit[x] = 9

 elif(lineSplit[x] == 'kk'):

 lineSplit[x] = 2

 elif(lineSplit[3] == "{11}"):

 if(lineSplit[x] == 'fg'):

 lineSplit[x] = 1

 elif(lineSplit[x] == 'eg'):

 lineSplit[x] = 2

 elif(lineSplit[x] == 'ef'):

 lineSplit[x] = 3

 elif(lineSplit[x] == 'ee'):

 lineSplit[x] = 4

 else: #According to our logic, this shouldn't be able to happen. If it does, some additional logic will need to be added.

 sys.exit("Found hkxhk with phase {11}")

 else:

 if(lineSplit[x] == 'ac'):

 lineSplit[x] = 1

 elif(lineSplit[x] == 'bc'):

 lineSplit[x] = 2

 elif(lineSplit[x] == 'ad'):

 lineSplit[x] = 3

 elif(lineSplit[x] == 'bd'):

 lineSplit[x] = 4

 x += 1

 outString = (str(lineSplit))

 outputFile.write(outString[1:-1]+'\n')

print "Done"

inputFile.close()

outputFile.close()