

```
In [1]: include("/home/nicole/Jupyter/SSBRJ/src/SSBR.jl")  
        using SSBR
```

```
In [2]: function getPos(ped,IDs)  
        posAi = Array{Int64,size(IDs,1)}  
        for (i,id) = enumerate(IDs[:,1])  
            posAi[i] = ped.idMap[id].seqID  
        end  
        return posAi  
    end
```

Out[2]: getPos (generic function with 1 method)

```
In [3]: ; cd Data/0.5/M/1  
  
        /home/nicole/Jupyter/JG3/Data/0.5/M/1
```

```
In [4]: ;ls
```

```
G0.Genotype.ID
G0.ID
G0.noGenotype.ID
G1.Genotype.ID
G1.ID
G1.noGenotype.ID
G2.Genotype.ID
G2.ID
G2.noGenotype.ID
G3.Genotype.ID
G3.ID
G3.noGenotype.ID
G4.Genotype.ID
G4.ID
G4.noGenotype.ID
G5.Genotype.ID
G5.ID
G5.noGenotype.ID
MarNF.txt
PedAll.txt
Phe.txt
PheAll.txt
all.ID
genotype.ID
noGenotype.ID
sim.bv
sim.phenotype
```

```
In [5]: ;awk '{print $1}' PedAll.txt | sort -b > all.ID
```

```
In [6]: ;awk '{print $1}' MarNF.txt | sort -b > genotype.ID
```

```
In [7]: ;join -v1 all.ID genotype.ID > noGenotype.ID
```

```
In [8]: ;awk '{print $1,$2}' Phe.txt > sim.phenotype
```

```
In [9]: ;awk '{print $1,$3}' PheAll.txt > sim.bv
```

```
In [10]: ; awk 'NR >=1 && NR <=8000 {print $1}' PedAll.txt | sort -b > G0.ID
```

```
In [11]: ; awk 'NR >=8001 && NR <=16000 {print $1}' PedAll.txt | sort -b > G1.ID
```

```
In [12]: ; awk 'NR >=16001 && NR <=24000 {print $1}' PedAll.txt | sort -b > G2.ID
```

```
In [13]: ; awk 'NR >=24001 && NR <=32000 {print $1}' PedAll.txt | sort -b > G3.ID
```

```
In [14]: ; awk 'NR >=32001 && NR <=40000 {print $1}' PedAll.txt | sort -b > G4.ID
```

```
In [15]: ; awk 'NR >=40001 && NR <=48000 {print $1}' PedAll.txt | sort -b > G5.ID
```

```
In [16]: ;join G0.ID genotype.ID > G0.Genotype.ID
```

```
In [17]: ;join G1.ID genotype.ID > G1.Genotype.ID
```

```
In [18]: ;join G2.ID genotype.ID > G2.Genotype.ID
```

```
In [19]: ;join G3.ID genotype.ID > G3.Genotype.ID
```

```
In [20]: ;join G4.ID genotype.ID > G4.Genotype.ID
```

```
In [21]: ;join G5.ID genotype.ID > G5.Genotype.ID
```

```
In [22]: ;join -v1 G0.ID genotype.ID > G0.noGenotype.ID
```

```
In [23]: ;join -v1 G1.ID genotype.ID > G1.noGenotype.ID
```

```
In [24]: ;join -v1 G2.ID genotype.ID > G2.noGenotype.ID
```

```
In [25]: ;join -v1 G3.ID genotype.ID > G3.noGenotype.ID
```

```
In [26]: ;join -v1 G4.ID genotype.ID > G4.noGenotype.ID
```

```
In [27]: ;join -v1 G5.ID genotype.ID > G5.noGenotype.ID
```

```
In [28]: ;wc G0.Genotype.ID;wc G1.Genotype.ID;wc G2.Genotype.ID;wc G3.Genotype.ID;wc G4.Genotype.ID;wc G5.Genotype
200  200 1200 G0.Genotype.ID
200  200 1200 G1.Genotype.ID
200  200 1200 G2.Genotype.ID
200  200 1200 G3.Genotype.ID
200  200 1200 G4.Genotype.ID
8000 8000 48000 G5.Genotype.ID
```

```
In [29]: ;wc G0.noGenotype.ID;wc G1.noGenotype.ID;wc G2.noGenotype.ID;wc G3.noGenotype.ID;wc G4.noGenotype.ID;wc G
7800 7800 46800 G0.noGenotype.ID
7800 7800 46800 G1.noGenotype.ID
7800 7800 46800 G2.noGenotype.ID
7800 7800 46800 G3.noGenotype.ID
7800 7800 46800 G4.noGenotype.ID
0 0 0 G5.noGenotype.ID
```

```
In [30]: ped,A_Mats,numSSBayes = calc_Ai("PedAll.txt","genotype.ID",calculateInbreeding=false)
nothing
df      = read_genotypes("MarNF.txt",numSSBayes)
M_Mats = make_MMats(df,A_Mats,ped,center=true);           # with centering
y_Vecs = make_yVecs("sim.phenotype",ped,numSSBayes)
J_Vecs = make_JVecs(numSSBayes,A_Mats)
Z_Mats = make_ZMats(ped,y_Vecs,numSSBayes)
X_Mats, W_Mats = make_XWMats(J_Vecs,Z_Mats,M_Mats,numSSBayes) # with J
nothing
```

```
In [31]: vRes    = 0.668
         vG      = 0.668
         nIter   = 50000
         @time aHat1,alphaHat,betaHat,epsiHat =
         ssGibbs(M_Mats,y_Vecs,J_Vecs,Z_Mats,X_Mats,W_Mats,A_Mats, numSSBayes,vRes,vG,nIter, outFreq=5000);
         nothing

         This is iteration 5000
         This is iteration 10000
         This is iteration 15000
         This is iteration 20000
         This is iteration 25000
         This is iteration 30000
         This is iteration 35000
         This is iteration 40000
         This is iteration 45000
         This is iteration 50000
         4737.315395 seconds (23.03 G allocations: 723.420 GB, 6.88% gc time)
```

```
In [32]: betaHat
```

```
Out[32]: 2-element Array{Float64,1}:
          10.5597
          -1.083
```

```
In [33]: mu  = betaHat[1]
         mug = betaHat[2]
```

```
Out[33]: -1.083002823491621
```

```
In [34]: (mu+mug)/2
```

```
Out[34]: 4.738330074326082
```

```
In [35]: alphaHat
```

```
Out[35]: 150-element Array{Float64,1}:  
  -0.075589  
   0.0624568  
 -0.00415963  
 -0.107924  
 -0.0315189  
   0.0518399  
   0.0240429  
 -0.0056429  
   0.0742365  
   0.0608346  
 -0.0275957  
   0.0356874  
 -0.0287195  
      ⋮  
   0.0859123  
   0.0124856  
   0.120753  
   0.0338222  
   0.0157058  
 -0.0781837  
 -0.0546792  
 -0.186139  
   0.0306005  
 -0.0187556  
   0.0790858  
 -0.0218811
```

```
In [36]: writedlm("alphaEstimatesJC",alphaHat)
```

```
In [37]: epsiHat
```

```
Out[37]: 45906-element Array{Float64,1}:
 0.393149
-0.40258
 0.179042
-1.00274
 0.0955641
-0.0266414
-0.131154
 0.627169
-0.987588
 0.00583331
-0.86002
 0.0881181
-0.132383
 ⋮
-0.170698
 0.366272
 0.322672
-0.17956
 0.602609
-0.667326
-0.296063
 0.0108013
 0.16355
-0.374182
 0.0859966
-1.4076
```

```
In [38]: writedlm("epsiEstimatesJC",epsiHat)
```

```
In [39]: using DataFrames
```

```
In [40]: df = readtable("sim.bv", eltypes=[UTF8String, Float64], separator = ' ',header=false)
a = Array{Float64,numSSBayes.num_ped}
for (i,ID) in enumerate(df[:,1])
    j = ped.idMap[ID].seqID
    a[j] = df[i,2]
end
```

```
In [41]: IDs = readtable("all.ID", eltypes =[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor1 = cor(a[posAi],aHat1[posAi])[1,1]
reg1 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - all.ID : correlation = %6.3f\n", cor1 ) # with epsilon
@printf("SSBRJC from Gibbs - all.ID : regression of TBV on GEBV = %6.3f\n", reg1)
JCA11 = cor1
```

```
SSBRJC from Gibbs - all.ID : correlation = 0.895
SSBRJC from Gibbs - all.ID : regression of TBV on GEBV = 0.988
```

```
Out[41]: 0.8945930730256502
```

```
In [42]: GEBV = aHat1[posAi]
mean(GEBV)
```

```
Out[42]: 0.8109925176504206
```

```
In [43]: IDs = readtable("genotype.ID", eltypes =[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor2 = cor(a[posAi],aHat1[posAi])[1,1]
reg2 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - genotype.ID : correlation = %6.3f\n", cor2 ) # with epsilon
@printf("SSBRJC from Gibbs - genotype.ID : regression of TBV on GEBV = %6.3f\n", reg2)
JCA11 = cor2
```

```
SSBRJC from Gibbs - genotype.ID : correlation = 0.798
SSBRJC from Gibbs - genotype.ID : regression of TBV on GEBV = 0.995
```

```
Out[43]: 0.798351985798852
```

```
In [44]: GEBV = aHat1[posAi]
mean(GEBV)
```

```
Out[44]: 1.871806954669617
```



```
In [45]: IDs = readtable("noGenotype.ID", eltypes =[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor3 = cor(a[posAi],aHat1[posAi])[1,1]
reg3 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - noGenotype.ID : correlation = %6.3f\n", cor3 ) # with epsilon
@printf("SSBRJC from Gibbs - noGenotype.ID : regression of TBV on GEBV = %6.3f\n", reg3)
JCA11 = cor3
```

```
SSBRJC from Gibbs - noGenotype.ID : correlation = 0.868
SSBRJC from Gibbs - noGenotype.ID : regression of TBV on GEBV = 0.958
```

```
Out[45]: 0.8679037528580135
```

```
In [46]: GEBV = aHat1[posAi]
mean(GEBV)
```

```
Out[46]: 0.5661891860306059
```

```
In [47]: IDs = readtable("G0.ID", eltypes =[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor4 = cor(a[posAi],aHat1[posAi])[1,1]
reg4 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - G0.ID : correlation = %6.3f\n", cor4 ) # with epsilon
@printf("SSBRJC from Gibbs - G0.ID : regression of TBV on GEBV = %6.3f\n", reg4)
JCA11 = cor4
```

```
SSBRJC from Gibbs - G0.ID : correlation = 0.703
SSBRJC from Gibbs - G0.ID : regression of TBV on GEBV = 0.836
```

```
Out[47]: 0.703127929796947
```

```
In [48]: GEBV = aHat1[posAi]
G1GEBV=mean(GEBV)
```

```
Out[48]: -0.5489418558924295
```

```
In [49]: IDs = readtable("G1.ID", eltypes=[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor4 = cor(a[posAi],aHat1[posAi])[1,1]
reg4 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - G1.ID : correlation = %6.3f\n", cor4 ) # with epsilon
@printf("SSBRJC from Gibbs - G1.ID : regression of TBV on GEBV = %6.3f\n", reg4)
JCA11 = cor4
```

```
SSBRJC from Gibbs - G1.ID : correlation = 0.765
SSBRJC from Gibbs - G1.ID : regression of TBV on GEBV = 0.997
```

```
Out[49]: 0.7646092902492897
```

```
In [50]: GEBV = aHat1[posAi]
G1GEBV=mean(GEBV)
```

```
Out[50]: 0.13156727808573696
```

```
In [51]: IDs = readtable("G2.ID", eltypes=[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor5 = cor(a[posAi],aHat1[posAi])[1,1]
reg5 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - G2.ID : correlation = %6.3f\n", cor5 ) # with epsilon
@printf("SSBRJC from Gibbs - G2.ID : regression of TBV on GEBV = %6.3f\n", reg5)
JCA11 = cor5
```

```
SSBRJC from Gibbs - G2.ID : correlation = 0.753
SSBRJC from Gibbs - G2.ID : regression of TBV on GEBV = 0.995
```

```
Out[51]: 0.7526234600520422
```

```
In [52]: GEBV = aHat1[posAi]
G2GEBV=mean(GEBV)
```

```
Out[52]: 0.6732165532140835
```

```
In [53]: IDs = readtable("G3.ID", eltypes=[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor6 = cor(a[posAi],aHat1[posAi])[1,1]
reg6 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - G3.ID : correlation = %6.3f\n", cor6 ) # with epsilon
@printf("SSBRJC from Gibbs - G3.ID : regression of TBV on GEBV = %6.3f\n", reg6)
JCall = cor6
```

```
SSBRJC from Gibbs - G3.ID : correlation = 0.748
SSBRJC from Gibbs - G3.ID : regression of TBV on GEBV = 1.001
```

```
Out[53]: 0.7476999793829657
```

```
In [54]: GEBV = aHat1[posAi]
G3GEBV=mean(GEBV)
```

```
Out[54]: 1.1502268895975098
```

```
In [55]: IDs = readtable("G4.ID", eltypes=[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor7 = cor(a[posAi],aHat1[posAi])[1,1]
reg7 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - G4.ID : correlation = %6.3f\n", cor7 ) # with epsilon
@printf("SSBRJC from Gibbs - G4.ID : regression of TBV on GEBV = %6.3f\n", reg7)
JCall = cor7
```

```
SSBRJC from Gibbs - G4.ID : correlation = 0.749
SSBRJC from Gibbs - G4.ID : regression of TBV on GEBV = 1.017
```

```
Out[55]: 0.7492012018659512
```

```
In [56]: GEBV = aHat1[posAi]
G4GEBV=mean(GEBV)
```

```
Out[56]: 1.5539988754094662
```

```
In [57]: IDs = readtable("G5.ID", eltypes =[UTF8String], separator = ' ',header=false)
        posAi = getPos(ped,IDs)
        cor8 = cor(a[posAi],aHat1[posAi])[1,1]
        reg8 = linreg(aHat1[posAi], a[posAi])[2,1]
        @printf("SSBRJC from Gibbs - G5.ID : correlation = %6.3f\n", cor8 ) # with epsilon
        @printf("SSBRJC from Gibbs - G5.ID : regression of TBV on GEBV = %6.3f\n", reg8)
        JCA11 = cor8
```

```
SSBRJC from Gibbs - G5.ID : correlation =  0.774
SSBRJC from Gibbs - G5.ID : regression of TBV on GEBV =  0.953
```

```
Out[57]: 0.7740478671066228
```

```
In [58]: reg8 = linreg(aHat1[posAi], a[posAi])
```

```
Out[58]: 2-element Array{Float64,1}:
         10.7573
          0.953139
```

```
In [59]: VarGEBV=var(aHat1[posAi])
```

```
Out[59]: 0.3111675617150535
```

```
In [60]: VarTBV=var(a[posAi])
```

```
Out[60]: 0.4718144954888738
```

```
In [61]: Cov=cov(aHat1[posAi], a[posAi])
```

```
Out[61]: 0.2965859792538928
```

```
In [62]: b=Cov/VarGEBV
```

```
Out[62]: 0.953139130631767
```

```
In [63]: GEBV = aHat1[posAi]
        G5GEBV=mean(GEBV)
```

```
Out[63]: 1.9058873654881558
```

```
In [64]: GEBVG5G1=G5GEBV-G1GEBV
```

```
Out[64]: 1.774320087402419
```

```
In [65]: GEBVG1G5=[G1GEBV;G2GEBV;G3GEBV;G4GEBV;G5GEBV]
```

```
Out[65]: 5-element Array{Float64,1}:
```

```
 0.131567
 0.673217
 1.15023
 1.554
 1.90589
```

```
In [66]: IDs = readtable("G0.Genotype.ID", eltypes =[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor9 = cor(a[posAi],aHat1[posAi])[1,1]
reg9 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - G0.Genotype.ID : correlation = %6.3f\n", cor9 ) # with epsilon
@printf("SSBRJC from Gibbs - G0.Genotype.ID : regression of TBV on GEBV = %6.3f\n", reg9)
JCA11 = cor9
```

```
SSBRJC from Gibbs - G0.Genotype.ID : correlation = 0.797
```

```
SSBRJC from Gibbs - G0.Genotype.ID : regression of TBV on GEBV = 1.017
```

```
Out[66]: 0.797384160655277
```

```
In [67]: GEBV = aHat1[posAi]
mean(GEBV)
```

```
Out[67]: 0.9192030837116892
```

```
In [68]: IDs = readtable("G1.Genotype.ID", eltypes =[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor9 = cor(a[posAi],aHat1[posAi])[1,1]
reg9 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - G1.Genotype.ID : correlation = %6.3f\n", cor9 ) # with epsilon
@printf("SSBRJC from Gibbs - G1.Genotype.ID : regression of TBV on GEBV = %6.3f\n", reg9)
JCA11 = cor9
```

```
SSBRJC from Gibbs - G1.Genotype.ID : correlation =  0.819
SSBRJC from Gibbs - G1.Genotype.ID : regression of TBV on GEBV =  0.930
```

```
Out[68]: 0.8194082573594939
```

```
In [69]: GEBV = aHat1[posAi]
mean(GEBV)
```

```
Out[69]: 1.2927307873163707
```

```
In [70]: IDs = readtable("G2.Genotype.ID", eltypes =[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor10 = cor(a[posAi],aHat1[posAi])[1,1]
reg10 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - G2.Genotype.ID : correlation = %6.3f\n", cor10 ) # with epsilon
@printf("SSBRJC from Gibbs - G2.Genotype.ID : regression of TBV on GEBV = %6.3f\n", reg10)
JCA11 = cor10
```

```
SSBRJC from Gibbs - G2.Genotype.ID : correlation =  0.773
SSBRJC from Gibbs - G2.Genotype.ID : regression of TBV on GEBV =  0.846
```

```
Out[70]: 0.7732667417181541
```

```
In [71]: GEBV = aHat1[posAi]
mean(GEBV)
```

```
Out[71]: 1.666441502396924
```

```
In [72]: IDs = readtable("G3.Genotype.ID", eltypes =[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor11 = cor(a[posAi],aHat1[posAi])[1,1]
reg11 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - G3.Genotype.ID : correlation = %6.3f\n", cor11 ) # with epsilon
@printf("SSBRJC from Gibbs - G3.Genotype.ID : regression of TBV on GEBV = %6.3f\n", reg11)
JCA11 = cor11
```

```
SSBRJC from Gibbs - G3.Genotype.ID : correlation =  0.811
SSBRJC from Gibbs - G3.Genotype.ID : regression of TBV on GEBV =  0.921
```

```
Out[72]: 0.8107627629032843
```

```
In [73]: GEBV = aHat1[posAi]
mean(GEBV)
```

```
Out[73]: 1.918417104898762
```

```
In [74]: IDs = readtable("G4.Genotype.ID", eltypes =[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor12 = cor(a[posAi],aHat1[posAi])[1,1]
reg12 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - G4.Genotype.ID : correlation = %6.3f\n", cor12 ) # with epsilon
@printf("SSBRJC from Gibbs - G4.Genotype.ID : regression of TBV on GEBV = %6.3f\n", reg12)
JCA11 = cor12
```

```
SSBRJC from Gibbs - G4.Genotype.ID : correlation =  0.693
SSBRJC from Gibbs - G4.Genotype.ID : regression of TBV on GEBV =  0.762
```

```
Out[74]: 0.6926409701967934
```

```
In [75]: GEBV = aHat1[posAi]
mean(GEBV)
```

```
Out[75]: 2.199025862282788
```

```
In [76]: IDs = readtable("G5.Genotype.ID", eltypes =[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor13 = cor(a[posAi],aHat1[posAi])[1,1]
reg13 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - G5.Genotype.ID : correlation = %6.3f\n", cor13 ) # with epsilon
@printf("SSBRJC from Gibbs - G5.Genotype.ID : regression of TBV on GEBV = %6.3f\n", reg13)
JCA11 = cor13
```

```
SSBRJC from Gibbs - G5.Genotype.ID : correlation =  0.774
SSBRJC from Gibbs - G5.Genotype.ID : regression of TBV on GEBV =  0.953
```

```
Out[76]: 0.7740478671066228
```

```
In [77]: writedlm("Correlation.G5.M.JC.txt",cor13)
```

```
In [78]: writedlm("Regression.G5.M.JC.txt",reg13)
```

```
In [79]: TBVG5Gall = a[posAi]
TBVG5G=mean(TBVG5Gall)
```

```
Out[79]: 12.573878249999998
```

```
In [80]: GEBVG5Gall = aHat1[posAi]
GEBVG5G=mean(GEBVG5Gall)
```

```
Out[80]: 1.9058873654881558
```

```
In [81]: IDs = readtable("G0.noGenotype.ID", eltypes =[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor14 = cor(a[posAi],aHat1[posAi])[1,1]
reg14 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - G0.noGenotype.ID : correlation = %6.3f\n", cor14 ) # with epsilon
@printf("SSBRJC from Gibbs - G0.noGenotype.ID : regression of TBV on GEBV = %6.3f\n", reg14)
JCA11 = cor14
```

```
SSBRJC from Gibbs - G0.noGenotype.ID : correlation =  0.688
SSBRJC from Gibbs - G0.noGenotype.ID : regression of TBV on GEBV =  0.854
```

```
Out[81]: 0.6883862572110975
```



```
In [82]: GEBV = aHat1[posAi]
         mean(GEBV)
```

```
Out[82]: -0.5865865979335607
```

```
In [83]: IDs = readtable("G1.noGenotype.ID", eltypes =[UTF8String], separator = ' ',header=false)
         posAi = getPos(ped,IDs)
         cor14 = cor(a[posAi],aHat1[posAi])[1,1]
         reg14 = linreg(aHat1[posAi], a[posAi])[2,1]
         @printf("SSBRJC from Gibbs - G1.noGenotype.ID : correlation = %6.3f\n", cor14 ) # with epsilon
         @printf("SSBRJC from Gibbs - G1.noGenotype.ID : regression of TBV on GEBV = %6.3f\n", reg14)
         JCall = cor14
```

```
SSBRJC from Gibbs - G1.noGenotype.ID : correlation =  0.749
SSBRJC from Gibbs - G1.noGenotype.ID : regression of TBV on GEBV =  1.005
```

```
Out[83]: 0.7492006724368606
```

```
In [84]: GEBV = aHat1[posAi]
         mean(GEBV)
```

```
Out[84]: 0.10179385477213096
```

```
In [85]: IDs = readtable("G2.noGenotype.ID", eltypes =[UTF8String], separator = ' ',header=false)
         posAi = getPos(ped,IDs)
         cor15 = cor(a[posAi],aHat1[posAi])[1,1]
         reg15 = linreg(aHat1[posAi], a[posAi])[2,1]
         @printf("SSBRJC from Gibbs - G2.noGenotype.ID : correlation = %6.3f\n", cor15 ) # with epsilon
         @printf("SSBRJC from Gibbs - G2.noGenotype.ID : regression of TBV on GEBV = %6.3f\n", reg15)
         JCall = cor15
```

```
SSBRJC from Gibbs - G2.noGenotype.ID : correlation =  0.737
SSBRJC from Gibbs - G2.noGenotype.ID : regression of TBV on GEBV =  0.995
```

```
Out[85]: 0.7370046664942043
```

```
In [86]: GEBV = aHat1[posAi]
         mean(GEBV)
```

```
Out[86]: 0.64774924682478
```

```
In [87]: IDs = readtable("G3.noGenotype.ID", eltypes =[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor16 = cor(a[posAi],aHat1[posAi])[1,1]
reg16 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - G3.noGenotype.ID : correlation = %6.3f\n", cor16 ) # with epsilon
@printf("SSBRJC from Gibbs - G3.noGenotype.ID : regression of TBV on GEBV = %6.3f\n", reg16)
JCA11 = cor16
```

```
SSBRJC from Gibbs - G3.noGenotype.ID : correlation =  0.734
SSBRJC from Gibbs - G3.noGenotype.ID : regression of TBV on GEBV =  0.990
```

```
Out[87]: 0.7339195914558114
```

```
In [88]: GEBV = aHat1[posAi]
mean(GEBV)
```

```
Out[88]: 1.1305297045897855
```

```
In [89]: IDs = readtable("G4.noGenotype.ID", eltypes =[UTF8String], separator = ' ',header=false)
posAi = getPos(ped,IDs)
cor17 = cor(a[posAi],aHat1[posAi])[1,1]
reg17 = linreg(aHat1[posAi], a[posAi])[2,1]
@printf("SSBRJC from Gibbs - G4.noGenotype.ID : correlation = %6.3f\n", cor17 ) # with epsilon
@printf("SSBRJC from Gibbs - G4.noGenotype.ID : regression of TBV on GEBV = %6.3f\n", reg17)
JCA11 = cor17
```

```
SSBRJC from Gibbs - G4.noGenotype.ID : correlation =  0.740
SSBRJC from Gibbs - G4.noGenotype.ID : regression of TBV on GEBV =  1.009
```

```
Out[89]: 0.7404471584886836
```

```
In [90]: GEBV = aHat1[posAi]
mean(GEBV)
```

```
Out[90]: 1.537459721899894
```

```
In [91]: numSSBayes
```

```
Out[91]: SSBR.NumSSBayes(54906,45906,9000,40000,39000,1000,150)
```

```
In [92]: J1 = sortrows(J_Vecs.J1)
```

```
Out[92]: 45906x1 Array{Float64,2}:
```

```
-0.999676  
-0.997643  
-0.988757  
-0.987284  
-0.985823  
-0.985587  
-0.985551  
-0.985066  
-0.984633  
-0.984498  
-0.984346  
-0.984273  
-0.984156  
:  
6.08279e-17  
6.14904e-17  
6.60531e-17  
6.67238e-17  
6.67549e-17  
7.5108e-17  
8.07893e-17  
8.88438e-17  
9.974e-17  
1.0006e-16  
1.10761e-16  
1.10949e-16
```

```
In [93]: J1[J1 .< 0.0,:]
```

```
Out[93]: 43936x1 Array{Float64,2}:
```

```
-0.999676  
-0.997643  
-0.988757  
-0.987284  
-0.985823  
-0.985587  
-0.985551  
-0.985066  
-0.984633  
-0.984498  
-0.984346  
-0.984273  
-0.984156  
:  
-7.21871e-36  
-7.20816e-36  
-7.20816e-36  
-7.20812e-36  
-7.20812e-36  
-7.20395e-36  
-7.05053e-36  
-4.91411e-36  
-2.5921e-65  
-5.33294e-67  
-2.66647e-67  
-1.78216e-67
```

```
In [94]: J1[J1 .> 0.0,:]
```

```
Out[94]: 1264x1 Array{Float64,2}:
```

```
8.00262e-52
```

```
8.02614e-52
```

```
1.60052e-51
```

```
1.60476e-51
```

```
1.60523e-51
```

```
1.60523e-51
```

```
2.40174e-51
```

```
3.19885e-51
```

```
3.20388e-51
```

```
3.20953e-51
```

```
4.53675e-51
```

```
4.80349e-51
```

```
6.42512e-51
```

```
:
```

```
6.08279e-17
```

```
6.14904e-17
```

```
6.60531e-17
```

```
6.67238e-17
```

```
6.67549e-17
```

```
7.5108e-17
```

```
8.07893e-17
```

```
8.88438e-17
```

```
9.974e-17
```

```
1.0006e-16
```

```
1.10761e-16
```

```
1.10949e-16
```