Omid Mokhtari

Parameter	Value
Student number	15
Probe address	45652402
p-value threshold	0.01
Normalization	preprocessQuantile
Statistical test	t-test

Task 3

This probe address belongs to Type I probe, which its next base is A and Color channel Red.
Illumina ID: cg01707559 – AddressB_ID: 64689504

AddressA

Sample	Red fluor	Green fluor	Type	Color
200400320115_R01C01	9754	1014	I	Red
200400320115_R02C01	10517	1288	I	Red
200400320115_R03C01	9276	1410	I	Red
200400320115_R04C01	10325	1731	I	Red
200400320115_R02C02	2639	1376	I	Red
200400320115_R03C02	2550	1399	I	Red
200400320115_R04C02	6758	1315	I	Red
200400320115_R05C02	2536	1618	I	Red

AddressB

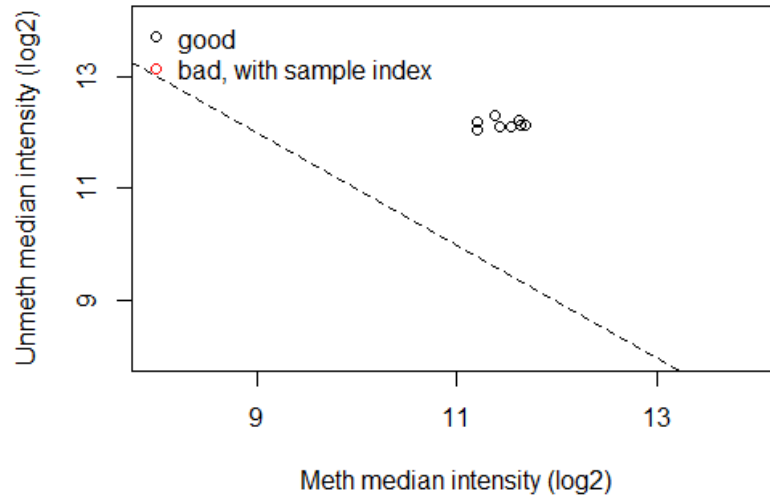| Sample	Red fluor	Green fluor	Type	Color
200400320115_R01C01	805	286	I	Red
200400320115_R02C01	713	541	I	Red
200400320115_R03C01	937	429	I	Red
200400320115_R04C01	1123	527	I	Red
200400320115_R02C02	512	367	I	Red
200400320115_R03C02	638	535	I	Red
200400320115_R04C02	563	355	I	Red
200400320115_R05C02	516	409	I	Red

Task 5

Figure 1 All dots are above the dashed line meaning high median methylation and unmethylation signals therefor the quality is high.
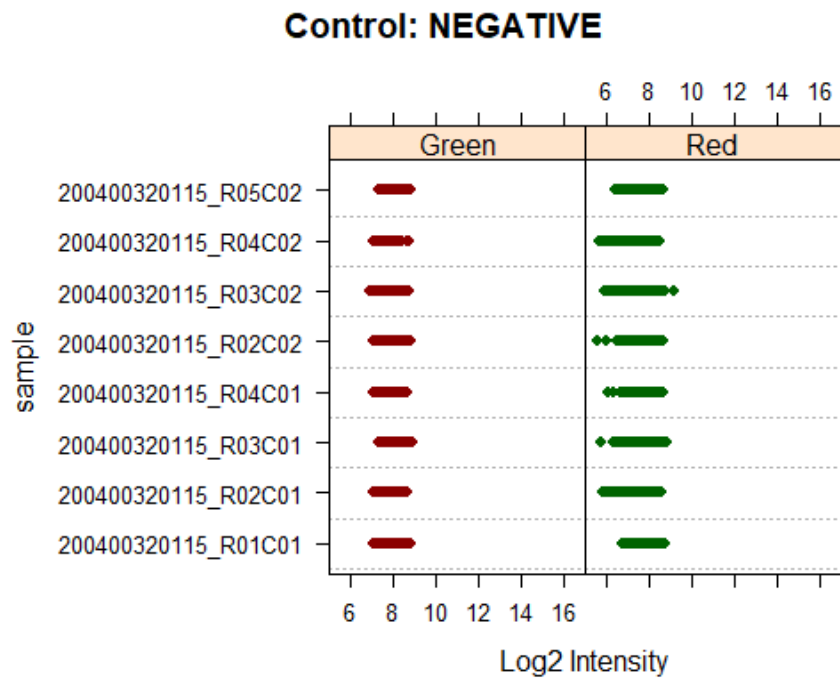
Control: NEGATIVE

Figure 2 all values below 10, So good quality.

Sample	Failed positions
200400320115_R01C01	56
200400320115_R02C01	39
200400320115_R03C01	42
200400320115_R04C01	35
200400320115_R02C02	242
200400320115_R03C02	186
200400320115_R04C02	21
200400320115_R05C02	550

this is the number of probes higher than our threshold (0.01)

Task 6

Density Beta values

Density M values

N = 485510 Bandwidth = 0.02176
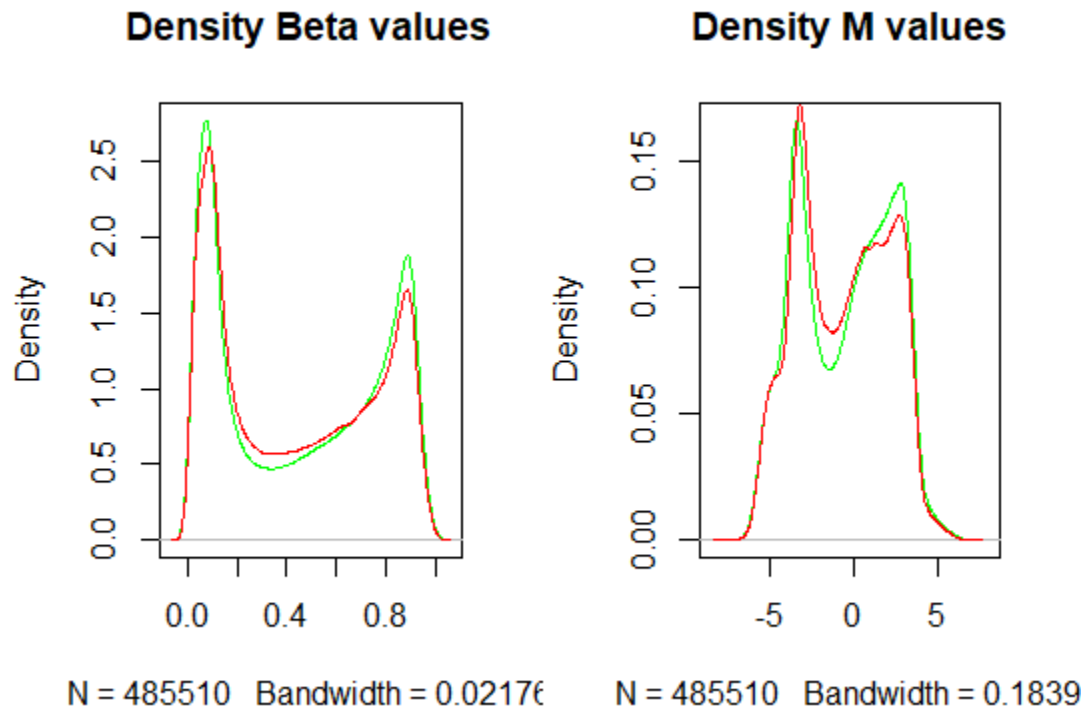
N = 485510 Bandwidth = 0.1839

Figure 3 Both groups (WT: Green, MUT: Red) are sort of the same however in the extreme part of the distributions WT have higher density.
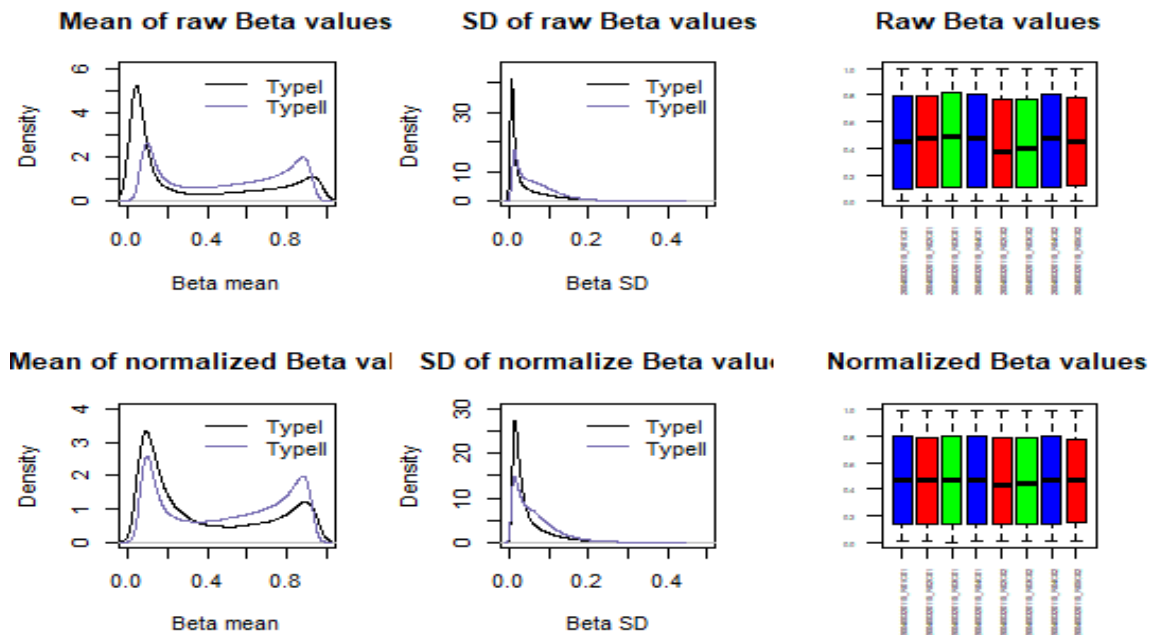
Task 7

Figure 4

- Mean plots

Since type II are less sensitive, probes are more central. However after normalization they're more aligned.

- SD plots

Since type II probes are less sensitive to extreme methylation values, Peak of type II probes are much lower than type I but after normalization their peak become closer.

- BoxPlots

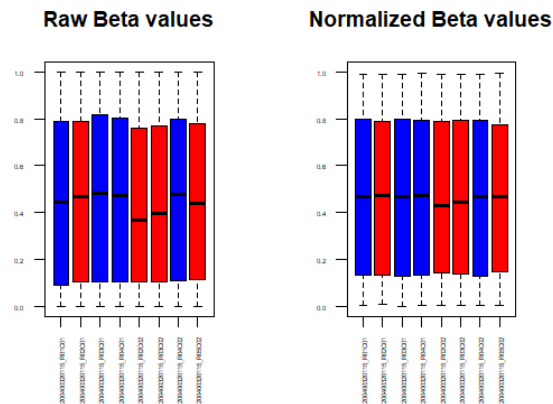After normalization their distribution became more similar and comparable.

Raw Beta values   Normalized Beta values

Figure 5 WT: Red, MUT: blue

We can see that the variability among two groups is barely detectable and they almost have same distribution.

Task 8

We can see the PCA grouped by both sex and WT/MUT. They are well separated by sex and sort of good by MUT/WT group.
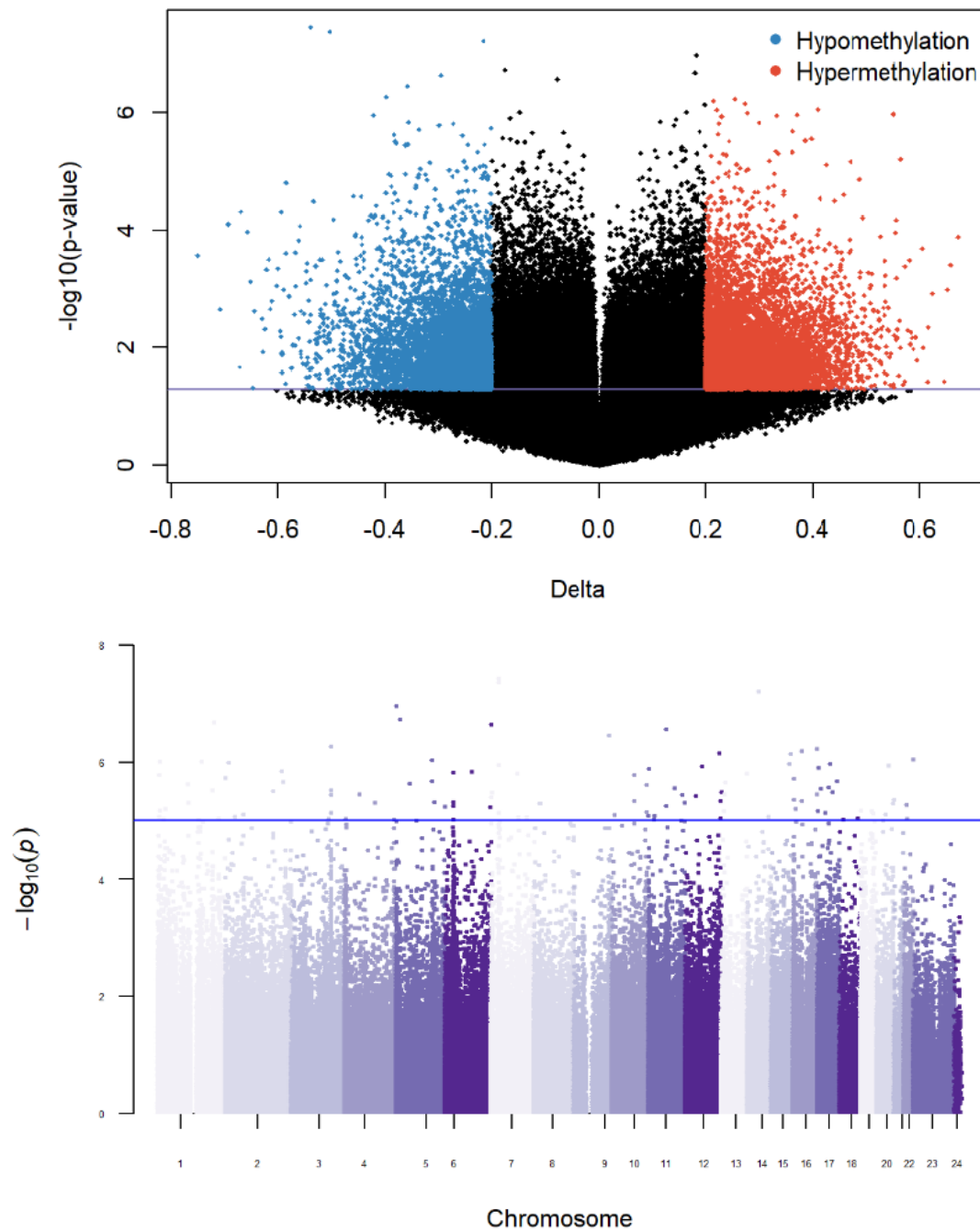
Task 10

Primarily, 67180 probes had p-value equal or less than 0.05

After Bonferroni correction, only 3 left showing strictness of this method.

And after Benjamini-Hotchberg correction, 167 probes had p-value equal or less than 0.05.

Task 11

Task 12

these heatmaps are drawn only from 10000 subset of whole data due to running errors

Color Key

0.2 0.6
Value

Complete linkage

■ MUT
■ WT

cg22016671
cg11069276
cg11581248
cg21848088
cg06207778
cg18114463
cg11205589
cg18975791
cg15947534
cg04830124
cg01709096
cg16315417
cg26564960
cg16519300
cg07381283
cg16045223
cg10522326
cg19688837
cg06380199
cg06970772
cg00562969
cg11754828
cg00662782
cg19602920
cg23986578

R02C01
R05C02
R03C02
R02C02
R04C02
R04C01
R01C01
R03C01

Color Key

0.2 0.6
Value

Single linkage

■ MUT
■ WT

cg14089881
cg11581248
cg22016671
cg21848088
cg01974180
cg09670535
cg13947830
cg08815479
cg22234529
cg04159546
cg11518359
cg10622019
cg02230408
cg19602920
cg26564960
cg02083536
cg26651722
cg07180646
cg25616787
cg11205589
cg19870933
cg19697382
cg06970772
cg21547845
cg13549940

R02C01
R05C02
R03C02
R02C02
R04C02
R04C01
R01C01
R03C01