**Task 1**

b)

r c grain straw

1 1 1 3.63 6.37

2 2 1 4.07 6.24

3 3 1 4.51 7.05

4 4 1 3.90 6.91

5 5 1 3.63 5.93

6 6 1 3.16 5.59

7 7 1 3.18 5.32

8 8 1 3.42 5.52

9 9 1 3.97 6.03

10 10 1 3.40 5.66

11 11 1 3.39 5.61

12 12 1 4.43 7.07

13 13 1 4.52 7.10

14 14 1 4.46 7.16

15 15 1 3.46 8.85

16 16 1 5.13 8.37

17 17 1 4.23 6.89

18 18 1 4.38 6.72

19 19 1 3.85 6.59

20 20 1 3.61 6.20

21 1 2 4.15 6.85

22 2 2 4.21 7.29

23 3 2 4.29 7.71

24 4 2 4.64 8.23

25 5 2 4.27 7.73

26 6 2 3.55 6.45

27 7 2 3.50 5.87

28 8 2 3.35 5.71

29 9 2 3.61 6.01

30 10 2 3.71 6.29

31 11 2 3.64 6.30

32 12 2 3.70 6.17

33 13 2 3.79 6.33

34 14 2 4.09 7.22

35 15 2 4.42 5.20

36 16 2 3.89 7.05

37 17 2 3.87 6.82

38 18 2 4.12 7.38

39 19 2 4.28 7.03

40 20 2 4.22 7.65

41 1 3 4.06 7.19

42 2 3 4.15 7.41

43 3 3 4.40 7.35

44 4 3 4.05 7.89

45 5 3 4.92 8.58

46 6 3 4.08 7.04

47 7 3 4.23 7.02

48 8 3 4.07 7.05

49 9 3 4.67 7.64

50 10 3 4.27 7.17

51 11 3 3.84 6.60

52 14 12 3.79 6.33

53 15 12 3.82 7.30

54 16 12 3.55 6.70

55 17 12 4.06 7.00

56 18 12 4.19 7.30

57 19 12 5.13 8.31

58 20 12 4.52 8.17

59 1 13 4.58 7.23

60 2 13 4.05 6.57

61 3 13 3.73 6.02

62 4 13 4.06 6.19

63 5 13 3.74 6.13

64 6 13 3.72 6.03

65 7 13 4.33 6.79

66 8 13 3.72 5.97

67 9 13 4.05 6.82

68 10 13 3.37 6.25

69 11 13 4.09 7.28

70 12 13 3.99 7.13

71 13 13 4.09 7.72

72 14 13 3.56 6.69

73 15 13 3.57 6.55

74 16 13 3.16 5.84

75 17 13 3.75 6.31

76 18 13 4.49 7.57

77 19 13 4.19 6.93

78 20 13 3.70 6.80

79 1 14 3.92 6.33

80 2 14 3.97 6.03

81 3 14 4.58 7.23

82 4 14 3.19 6.56

83 5 14 4.14 5.98

84 6 14 3.76 5.49

85 7 14 3.77 5.48

86 8 14 3.93 6.07

87 9 14 3.96 6.35

88 10 14 3.47 5.78

89 11 14 3.29 5.71

90 12 14 3.14 5.05

91 13 14 3.05 5.70

92 14 14 3.29 5.71

93 15 14 3.43 5.38

94 16 14 3.47 5.84

95 17 14 3.91 6.21

96 18 14 3.82 6.37

97 19 14 4.41 6.78

98 20 14 4.28 6.97

99 1 15 3.64 5.11

100 2 15 3.61 5.58

101 3 15 3.64 5.86

102 4 15 3.75 4.62

103 5 15 3.70 7.67

104 6 15 3.37 5.00

105 7 15 3.71 5.66

106 8 15 3.71 5.79

107 9 15 3.75 5.12

108 10 15 3.09 5.47

109 11 15 3.37 6.44

110 12 15 4.86 6.39

111 13 15 3.39 5.86

112 14 15 3.64 6.36

113 15 15 3.73 8.58

114 16 15 3.30 5.70

115 17 15 3.51 5.99

116 18 15 3.60 6.34

117 19 15 3.54 5.58

118 20 15 3.24 5.95

119 1 16 3.66 5.96

120 2 16 3.82 5.80

121 3 16 4.07 6.74

122 4 16 4.54 7.08

123 5 16 3.92 6.14

124 6 16 4.01 5.99

125 7 16 4.59 7.28

126 8 16 4.76 6.49

127 9 16 4.73 8.64

128 10 16 4.20 6.49

129 11 16 3.74 8.63

130 12 16 4.36 7.26

131 13 16 3.60 6.27

132 14 16 3.60 5.84

133 15 16 3.39 6.42

134 16 16 3.39 5.80

135 17 16 3.45 6.05

136 18 16 3.14 5.48

137 19 16 3.01 5.68

138 20 16 3.29 5.58

139 1 17 3.57 5.12

140 2 17 3.44 5.00

141 3 17 3.44 5.56

142 4 17 3.97 6.03

143 5 17 3.79 5.33

144 6 17 3.87 5.57

145 7 17 3.97 6.03

146 8 17 3.83 6.29

147 9 17 4.24 6.45

148 10 17 4.09 6.16

149 11 17 3.41 5.78

150 12 17 3.51 6.11

151 13 17 4.13 6.87

152 14 17 3.19 5.87

153 15 17 3.08 5.42

154 16 17 2.92 4.95

155 17 17 3.05 7.64

156 18 17 2.73 4.77

157 19 17 2.85 4.96

158 20 17 3.48 5.52

159 1 18 3.51 5.05

160 2 18 3.92 5.83

161 3 18 3.53 4.91

162 4 18 3.77 5.79

163 5 18 4.29 5.58

164 6 18 4.35 6.09

165 7 18 4.38 6.24

166 8 18 3.71 5.91

167 9 18 4.21 6.29

168 10 18 4.07 6.18

169 11 18 3.86 6.14

170 12 18 3.47 5.90

171 13 18 3.89 6.23

172 14 18 3.80 6.14

173 15 18 3.48 5.52

174 16 18 3.23 5.33

175 17 18 3.68 5.82

176 18 18 3.09 5.41

177 19 18 3.36 6.14

178 20 18 3.49 5.82

179 1 19 4.27 6.54

180 2 19 4.26 8.61

181 3 19 4.20 6.55

182 4 19 4.30 5.95

183 5 19 4.22 6.15

184 6 19 4.24 5.88

185 7 19 3.81 5.69

186 8 19 3.54 5.21

187 9 19 3.85 6.15

188 10 19 4.09 5.47

189 11 19 4.36 7.39

190 12 19 3.94 6.68

191 13 19 3.67 6.20

192 14 19 3.72 6.34

193 15 19 3.05 5.20

194 16 19 3.25 5.25

195 17 19 3.52 5.85

196 18 19 3.66 5.84

197 19 19 3.85 6.15

198 20 19 3.68 6.76

199 1 20 3.72 5.47

200 2 20 4.36 6.14

201 3 20 4.31 6.44

202 4 20 4.10 5.96

203 5 20 3.74 5.76

204 6 20 3.58 5.61

205 7 20 4.06 6.25

206 8 20 3.66 5.78

207 9 20 4.41 6.15

208 10 20 3.95 6.11

209 11 20 4.54 7.46

210 12 20 4.47 7.84

211 13 20 4.54 7.33

212 14 20 3.91 6.96

213 15 20 3.65 6.60

214 16 20 3.86 6.64

215 17 20 3.91 6.71

216 18 20 3.77 6.98

217 19 20 4.15 6.85

218 20 20 3.36 6.08

219 1 21 3.36 4.76

220 2 21 3.69 5.56

221 3 21 4.33 6.17

222 4 21 3.81 6.13

223 5 21 3.55 5.89

224 6 21 4.20 5.92

225 7 21 3.42 5.45

226 8 21 3.95 5.92

227 9 21 4.21 6.04

228 10 21 4.08 7.00

229 11 21 4.24 7.20

230 12 21 4.11 6.95

231 13 21 4.11 6.64

232 14 21 3.35 6.27

233 15 21 3.71 6.29

234 16 21 3.22 5.40

235 17 21 3.87 6.13

236 18 21 3.48 6.14

237 19 21 3.93 6.57

238 20 21 3.71 6.35

239 1 22 3.17 4.95

240 2 22 3.53 5.09

241 3 22 3.66 6.15

242 4 22 3.89 5.92

243 5 22 3.67 5.45

244 6 22 3.94 5.87

245 7 22 3.05 4.57

246 8 22 3.84 5.66

247 9 22 3.63 5.81

248 10 22 4.03 5.72

249 11 22 4.08 6.54

250 12 22 3.97 6.47

[ reached 'max' / getOption("max.print") -- omitted 250 rows ]

c)

r c grain straw

1 1 1 3.63 6.37

2 2 1 4.07 6.24

3 3 1 4.51 7.05

4 4 1 3.90 6.91

5 5 1 3.63 5.93

6 6 1 3.16 5.59

d)

r c grain straw

1 1 1 3.63 6.37

2 2 1 4.07 6.24

3 3 1 4.51 7.05

4 4 1 3.90 6.91

5 5 1 3.63 5.93

6 6 1 3.16 5.59

7 7 1 3.18 5.32

8 8 1 3.42 5.52

9 9 1 3.97 6.03

10 10 1 3.40 5.66

e)

attach(MHW)

**Task 2**

a)

r c

Min. : 1.00 Min. : 1

1st Qu.: 5.75 1st Qu.: 7

Median :10.50 Median :13

Mean :10.50 Mean :13

3rd Qu.:15.25 3rd Qu.:19

Max. :20.00 Max. :25

grain straw

Min. :2.730 Min. :4.100

1st Qu.:3.638 1st Qu.:5.878

Median :3.940 Median :6.360

Mean :3.949 Mean :6.515

3rd Qu.:4.270 3rd Qu.:7.170

Max. :5.160 Max. :8.850

Min. 1st Qu. Median Mean 3rd Qu.

2.730 3.638 3.940 3.949 4.270

Max.

5.160

Min. 1st Qu. Median Mean 3rd Qu.

4.100 5.878 6.360 6.515 7.170

Max.

8.850

b)

Grain

2.73

5.16

3.949

3.940

.2100202

.4582796

0% 25% 50% 75% 100%

2.7300 3.6375 3.9400 4.2700 5.1600

.6325

Straw

4.100

8.850

6.515

6.360

.8069553

.8983069

0% 25% 50% 75% 100%

4.1000 5.8775 6.3600 7.1700 8.8500

1.2925

c)

[1] 0.5698587 0.6522436 0.6397163 0.5643994

[5] 0.6121417 0.5652952 0.5977444 0.6195652

[9] 0.6583748 0.6007067 0.6042781 0.6265912

[13] 0.6366197 0.6229050 0.3909605 0.6129032

[17] 0.6139332 0.6517857 0.5842185 0.5822581

[21] 0.6058394 0.5775034 0.5564202 0.5637910

[25] 0.5523933 0.5503876 0.5962521 0.5866900

[29] 0.6006656 0.5898251 0.5777778 0.5996759

[33] 0.5987362 0.5664820 0.8500000 0.5517730

[37] 0.5674487 0.5582656 0.6088193 0.5516340

[41] 0.5646732 0.5600540 0.5986395 0.5133080

[45] 0.5734266 0.5795455 0.6025641 0.5773050

[49] 0.6112565 0.5955370 0.5818182 0.5987362

[53] 0.5232877 0.5298507 0.5800000 0.5739726

[57] 0.6173285 0.5532436 0.6334716 0.6164384

[61] 0.6196013 0.6558966 0.6101142 0.6169154

[65] 0.6377025 0.6231156 0.5938416 0.5392000

[69] 0.5618132 0.5596073 0.5297927 0.5321375

[73] 0.5450382 0.5410959 0.5942948 0.5931308

[77] 0.6046176 0.5441176 0.6192733 0.6583748

[81] 0.6334716 0.4862805 0.6923077 0.6848816

[85] 0.6879562 0.6474465 0.6236220 0.6003460

[89] 0.5761821 0.6217822 0.5350877 0.5761821

[93] 0.6375465 0.5941781 0.6296296 0.5996860

[97] 0.6504425 0.6140603 0.7123288 0.6469534

[101] 0.6211604 0.8116883 0.4823990 0.6740000

[105] 0.6554770 0.6407599 0.7324219 0.5648995

[109] 0.5232919 0.7605634 0.5784983 0.5723270

[113] 0.4347319 0.5789474 0.5859766 0.5678233

[117] 0.6344086 0.5445378 0.6140940 0.6586207

[121] 0.6038576 0.6412429 0.6384365 0.6694491

[125] 0.6304945 0.7334361 0.5474537 0.6471495

[129] 0.4333720 0.6005510 0.5741627 0.6164384

[133] 0.5280374 0.5844828 0.5702479 0.5729927

[137] 0.5299296 0.5896057 0.6972656 0.6880000

[141] 0.6187050 0.6583748 0.7110694 0.6947935

[145] 0.6583748 0.6089030 0.6573643 0.6639610

[149] 0.5899654 0.5744681 0.6011645 0.5434412

[153] 0.5682657 0.5898990 0.3992147 0.5723270

[157] 0.5745968 0.6304348 0.6950495 0.6723842

[161] 0.7189409 0.6511226 0.7688172 0.7142857

[165] 0.7019231 0.6277496 0.6693164 0.6585761

[169] 0.6286645 0.5881356 0.6243981 0.6188925

[173] 0.6304348 0.6060038 0.6323024 0.5711645

[177] 0.5472313 0.5996564 0.6529052 0.4947735

[181] 0.6412214 0.7226891 0.6861789 0.7210884

[185] 0.6695958 0.6794626 0.6260163 0.7477148

[189] 0.5899865 0.5898204 0.5919355 0.5867508

[193] 0.5865385 0.6190476 0.6017094 0.6267123

[197] 0.6260163 0.5443787 0.6800731 0.7100977

[201] 0.6692547 0.6879195 0.6493056 0.6381462

[205] 0.6496000 0.6332180 0.7170732 0.6464812

[209] 0.6085791 0.5701531 0.6193724 0.5617816

[213] 0.5530303 0.5813253 0.5827124 0.5401146

[217] 0.6058394 0.5526316 0.7058824 0.6636691

[221] 0.7017828 0.6215334 0.6027165 0.7094595

[225] 0.6275229 0.6672297 0.6970199 0.5828571

[229] 0.5888889 0.5913669 0.6189759 0.5342903

[233] 0.5898251 0.5962963 0.6313214 0.5667752

[237] 0.5981735 0.5842520 0.6404040 0.6935167

[241] 0.5951220 0.6570946 0.6733945 0.6712095

[245] 0.6673961 0.6784452 0.6247849 0.7045455

[249] 0.6238532 0.6136012 0.6745214 0.6189759

[253] 0.5102041 0.6222597 0.5160000 0.6153846

[257] 0.6420361 0.5700483 0.6556291 0.6144814

[261] 0.6635860 0.7186147 0.6812977 0.7285223

[265] 0.7543860 0.7175573 0.7473118 0.7026549

[269] 0.6505017 0.7017241 0.6330709 0.7184943

[273] 0.7123552 0.6666667 0.7682482 0.6795580

[277] 0.7168874 0.7703863 0.6957237 0.6920474

[281] 0.6321656 0.6395564 0.7071429 0.6818182

[285] 0.6495327 0.6207513 0.7151767 0.6926829

[289] 0.5941781 0.5579937 0.6906854 0.6003460

[293] 0.5893471 0.6103060 0.6123128 0.6047244

[297] 0.6031519 0.5911950 0.6681416 0.6936620

[301] 0.5847797 0.5557252 0.6570122 0.6975610

[305] 0.6056338 0.5840220 0.7199367 0.6560403

[309] 0.5823009 0.6089030 0.6090014 0.6474465

[313] 0.5950704 0.6060100 0.5901163 0.5797788

[317] 0.6046176 0.5308057 0.5560408 0.6273115

[321] 0.5679172 0.5704787 0.6094421 0.5924370

[325] 0.5814570 0.5818859 0.5230769 0.6420526

[329] 0.5948718 0.6253333 0.6066066 0.5903308

[333] 0.5927318 0.6289398 0.6401099 0.6460432

[337] 0.6359712 0.5737913 0.6206416 0.5762926

[341] 0.5896033 0.6116942 0.6233766 0.5924968

[345] 0.5850746 0.5876993 0.5837156 0.6454352

[349] 0.6356467 0.6110211 0.6122807 0.6214876

[353] 0.6129032 0.6599598 0.6435986 0.6313131

[357] 0.5649795 0.5584958 0.5497703 0.5580737

[361] 0.6059322 0.6055046 0.5625000 0.5264026

[365] 0.5468927 0.5915119 0.5162200 0.7368421

[369] 0.5641026 0.6389685 0.6052632 0.6056130

[373] 0.5951220 0.5874587 0.6295082 0.6017570

[377] 0.6122449 0.5115431 0.4994286 0.5240328

[381] 0.5484663 0.5577465 0.5479876 0.5263952

[385] 0.5837037 0.5411043 0.5466321 0.6497948

[389] 0.5786802 0.5819071 0.5947368 0.5562579

[393] 0.5964674 0.6129032 0.5920000 0.5858586

[397] 0.6139657 0.5795869 0.5091533 0.5511222

[401] 0.5682705 0.5670554 0.5481386 0.5326975

[405] 0.5895020 0.6231691 0.5750708 0.6644737

[409] 0.6724409 0.6340641 0.6200274 0.5688950

[413] 0.6114650 0.5961821 0.5695142 0.5897436

[417] 0.5703002 0.5555556 0.5690377 0.5850746

[421] 0.5196375 0.5422164 0.5628415 0.5856574

[425] 0.5792350 0.6077886 0.5272244 0.5931232

[429] 0.5832127 0.5546218 0.5240550 0.5006821

[433] 0.5597898 0.5861601 0.5822604 0.6027586

[437] 0.5495868 0.5545213 0.5109890 0.5361111

[441] 0.5418440 0.5413643 0.5704420 0.5681511

[445] 0.5625000 0.5555556 0.5285326 0.6814310

[449] 0.6923077 0.5919355 0.8484288 0.6298137

[453] 0.7813620 0.6471372 0.6512550 0.6099635

[457] 0.5729032 0.5679172 0.5899094 0.6219035

[461] 0.5883100 0.5628492 0.5701531 0.6138482

[465] 0.6163793 0.6168342 0.6454414 0.6474074

[469] 0.6518883 0.6375405 0.6694491 0.6022013

[473] 0.6941392 0.6356340 0.6411093 0.6191304

[477] 0.6286645 0.5791667 0.5942029 0.6381074

[481] 0.5899865 0.5817923 0.5721477 0.5955370

[485] 0.5847348 0.5799257 0.6462882 0.6590164

[489] 0.6516330 0.6389325 0.5964286 0.5645412

[493] 0.6704918 0.5862069 0.6129032 0.5953566

[497] 0.6373802 0.5889831 0.5016340 0.5326975

**Task 3**

a)

The decimal point is 1 digit(s) to the left of the |

27 | 38

28 | 45

29 | 279

30 | 144555557899

31 | 4446678999

32 | 2345589999

33 | 002455666677789999

34 | 00112233444444566777777888999

35 | 01112334444555666677789999

36 | 0001111133333444445666666777778889999

37 | 00011111122222233344444555556666667777899999

38 | 0011222223334444455566667777999999

39 | 0111111112222233333444444555666666777777777999

40 | 011122333344555666666677777778888899999999

41 | 0001111122333445555777779999

42 | 00001111111222333344444466677777788999999

43 | 0111223333566666777778888999999

44 | 0011111222234445566667777899

45 | 0112222234445667888899

46 | 1344446678899

47 | 3356677

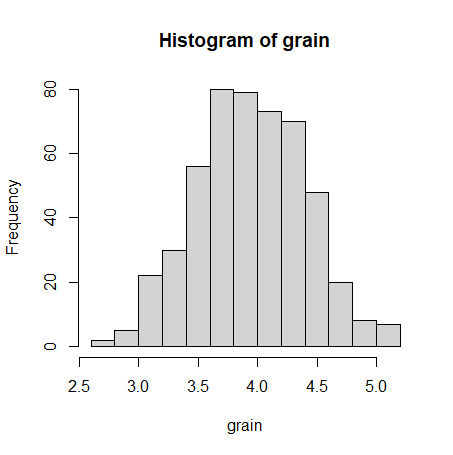
48 | 466

49 | 12349

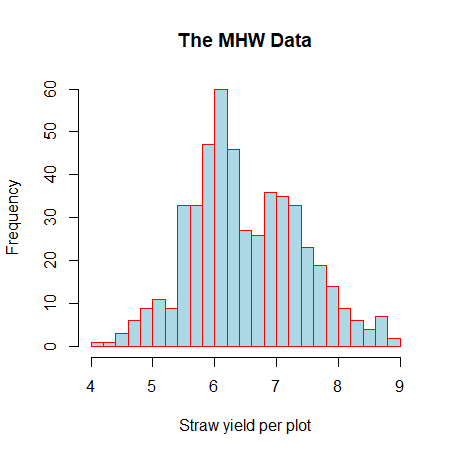
50 | 279

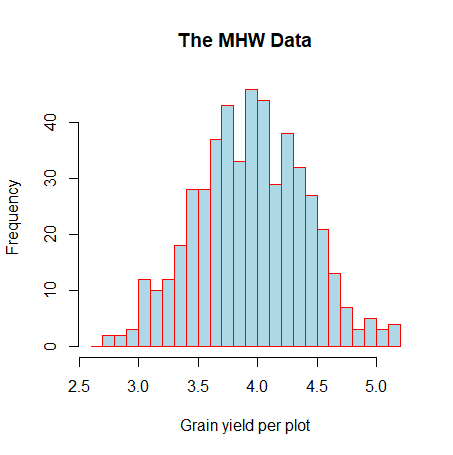
51 | 3336

b)

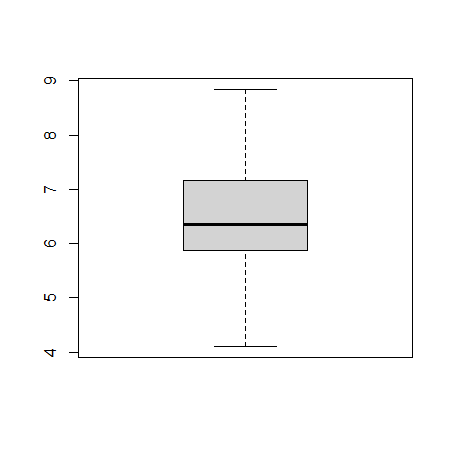
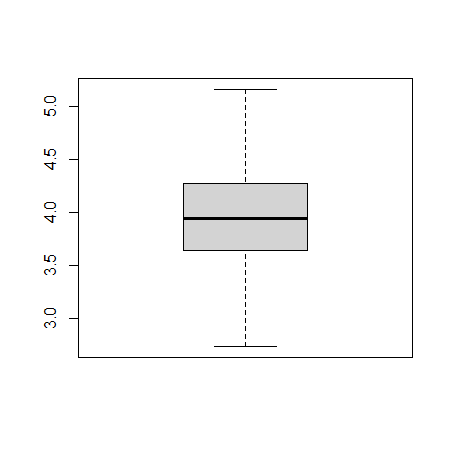


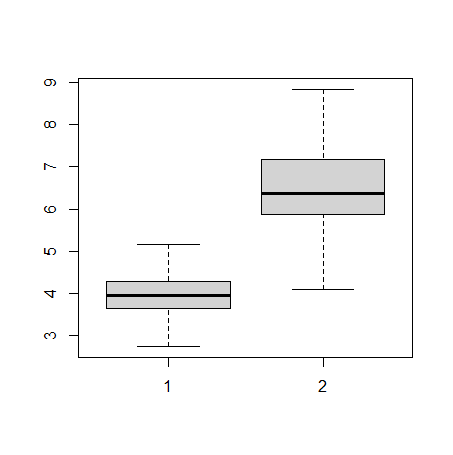
c)





d)





**Task 4**

a)

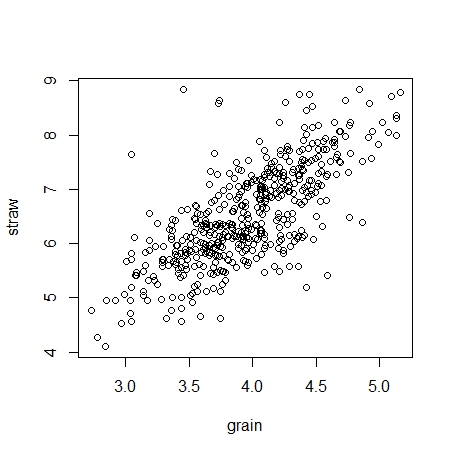
straw grain

6.51480 3.94864

straw grain

0.8983069 0.4582796

b)

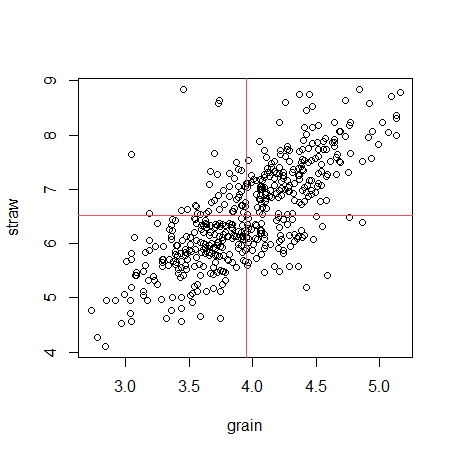


In this graph, there is a positive and linear relationship. A linear regression model would be appropropriate.

c)

Yes, the simple linear regression model would be appropriate.

d)



e)

Yes, the plot further proves that the simple linear regression model is appropriate

f)

.3004334 .7297817

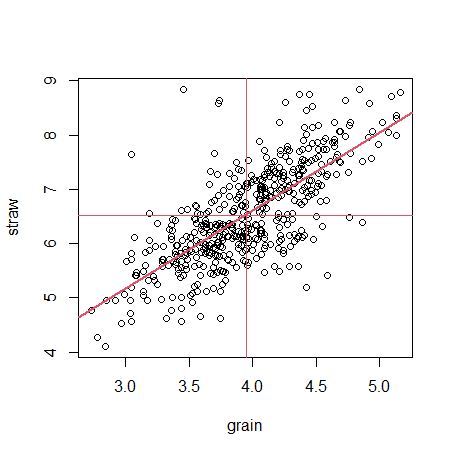
g)

.8662797 1.4304977

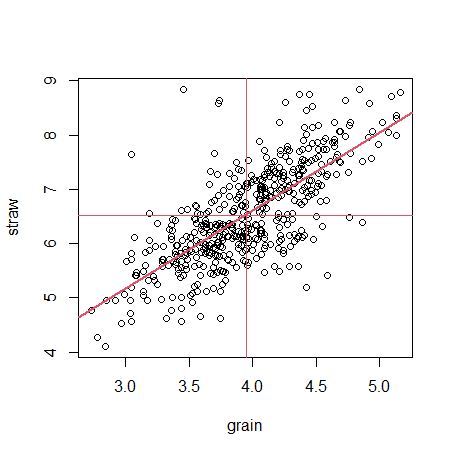
h)

Fitted straw yield = .8662797 + 1.4304977(grain yield)

i)



j)



Call:

lm(formula = straw ~ grain)

Coefficients:

(Intercept) grain

0.8663 1.4305

Call:

lm(formula = straw ~ grain)

Residuals:

Min 1Q Median 3Q Max

-2.02226 -0.35289 0.01039 0.37339 3.03420

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 0.86628 0.23872 3.629 0.000314 \*\*\*

grain 1.43050 0.06005 23.821 < 2e-16 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.6148 on 498 degrees of freedom

Multiple R-squared: 0.5326, Adjusted R-squared: 0.5316

F-statistic: 567.4 on 1 and 498 DF, p-value: < 2.2e-16

k)

Fitted straw yield = .8662797 + 1.4304977(4.0)

6.5882705