الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
يونيۏرسيتي اسلام انتارابڠسا مليسيا
Garden of Knowledge and Virtue

KULLIYYAH OF INFORMATION & COMMUNICATION TECHNOLOGY

SEMESTER 3, 2021/2022

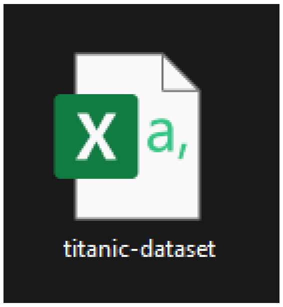
INFO 4313 DATA MINING

SECTION 01

"FINAL ASSESSMENT"

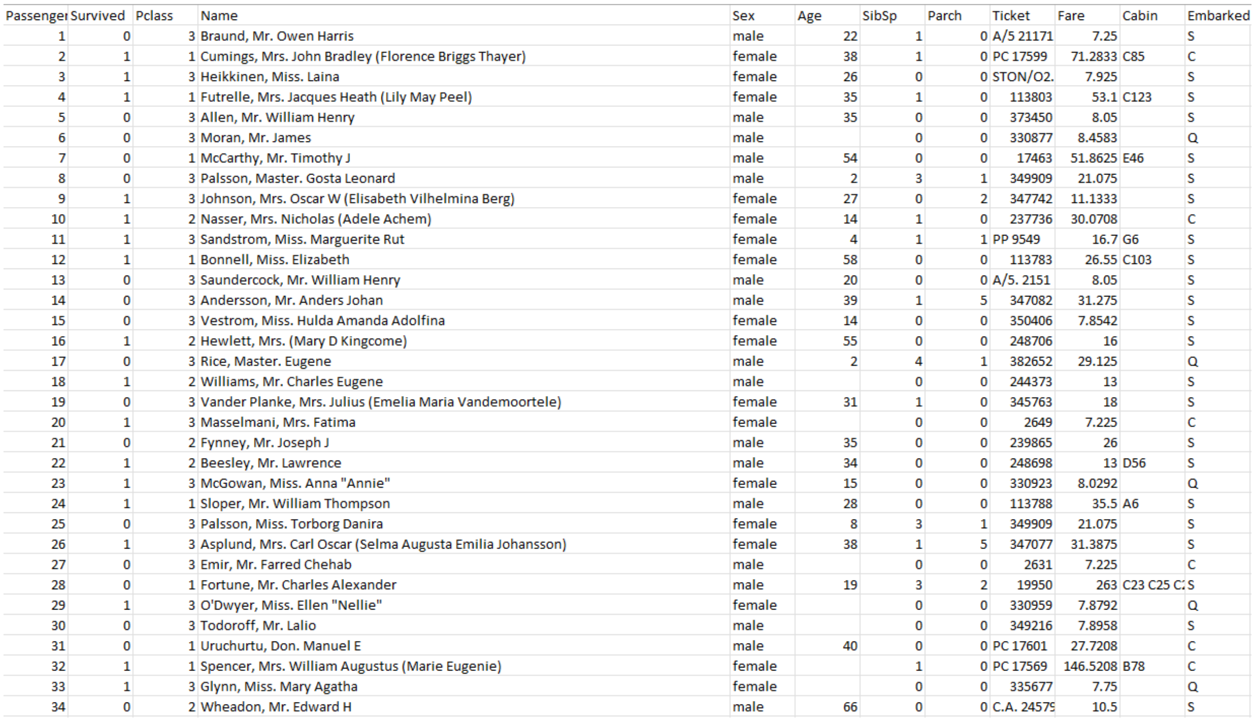
PREPARED BY:
JOYADDAR MD JOBAYER 1731833

1. I have downloaded the excel file as given in part A which is Titanic.csv.



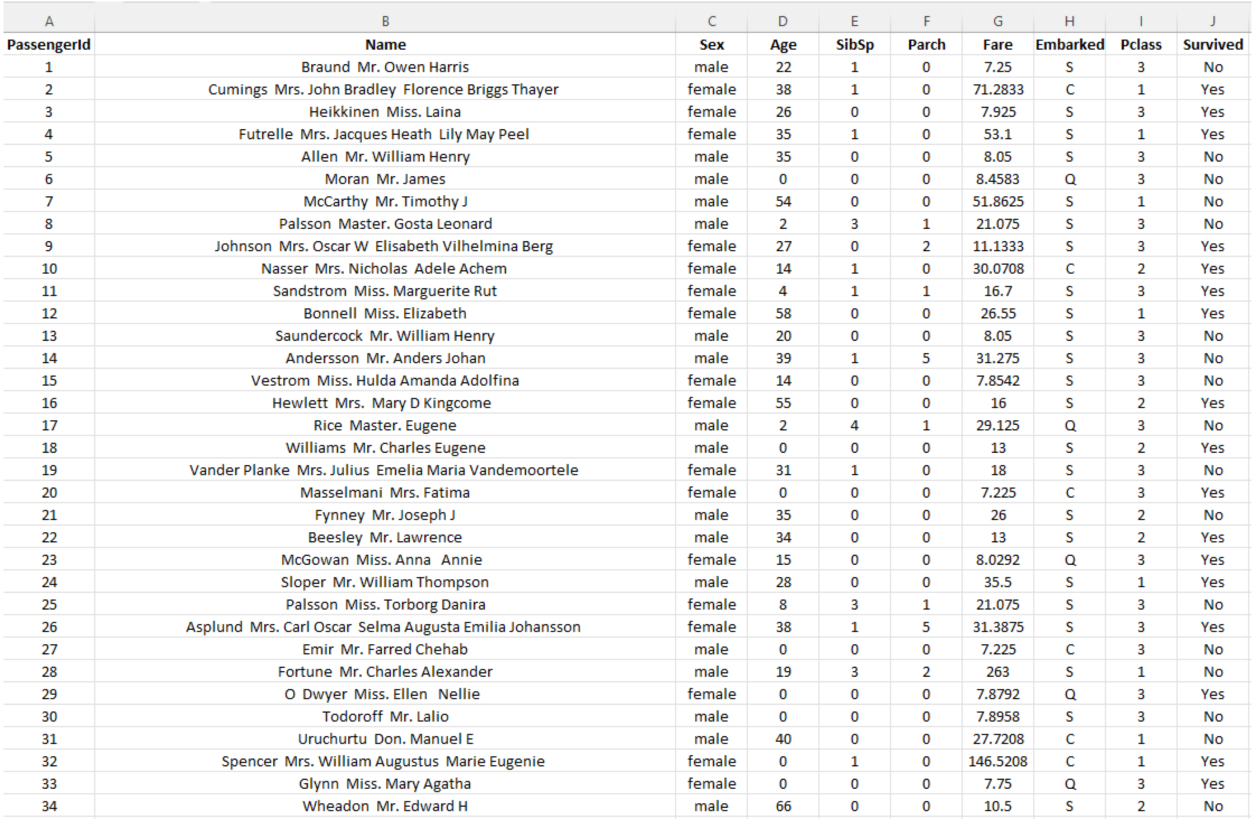
2.

The titanic dataset contains 891 data. After downloading the dataset, I did some pre-processing with the dataset. Firstly, I used a substitute formula in excel to clean the Name column. After that, I have deleted to Colum from the dataset to run with Weka which are cabin and ticket. Also, I filled up with 0 for missing data or empty cell. Lastly, I have changed with 1 for yes and 0 for No in survive Colum. I used IF formula to change the value from 0,1 to yes, no.



Passenger	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
1	0	3	Braund, Mr. Owen Harris	male	22	1	0	A/5 21171	7.25		S
2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Thayer)	female	38	1	0	PC 17599	71.2833	C85	C
3	1	3	Heikkinen, Miss. Laina	female	26	0	0	STON/O2.	7.925		S
4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35	1	0	113803	53.1	C123	S
5	0	3	Allen, Mr. William Henry	male	35	0	0	373450	8.05		S
6	0	3	Moran, Mr. James	male		0	0	330877	8.4583		Q
7	0	1	McCarthy, Mr. Timothy J	male	54	0	0	17463	51.8625	E46	S
8	0	3	Palsson, Master. Gosta Leonard	male	2	3	1	349909	21.075		S
9	1	3	Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg)	female	27	0	2	347742	11.1333		S
10	1	2	Nasser, Mrs. Nicholas (Adele Achem)	female	14	1	0	237736	30.0708		C
11	1	3	Sandstrom, Miss. Marguerite Rut	female	4	1	1	PP 9549	16.7	G6	S
12	1	1	Bonnell, Miss. Elizabeth	female	58	0	0	113783	26.55	C103	S
13	0	3	Saundercock, Mr. William Henry	male	20	0	0	A/5. 2151	8.05		S
14	0	3	Andersson, Mr. Anders Johan	male	39	1	5	347082	31.275		S
15	0	3	Vestrom, Miss. Hulda Amanda Adolfina	female	14	0	0	350406	7.8542		S
16	1	2	Hewlett, Mrs. (Mary D Kingcome)	female	55	0	0	248706	16		S
17	0	3	Rice, Master. Eugene	male	2	4	1	382652	29.125		Q
18	1	2	Williams, Mr. Charles Eugene	male		0	0	244373	13		S
19	0	3	Vander Planke, Mrs. Julius (Emelia Maria Vandemoortele)	female	31	1	0	345763	18		S
20	1	3	Masselmani, Mrs. Fatima	female		0	0	2649	7.225		C
21	0	2	Fynney, Mr. Joseph J	male	35	0	0	239865	26		S
22	1	2	Beesley, Mr. Lawrence	male	34	0	0	248698	13	D56	S
23	1	3	McGowan, Miss. Anna "Annie"	female	15	0	0	330923	8.0292		Q
24	1	1	Sloper, Mr. William Thompson	male	28	0	0	113788	35.5	A6	S
25	0	3	Palsson, Miss. Torborg Danira	female	8	3	1	349909	21.075		S
26	1	3	Asplund, Mrs. Carl Oscar (Selma Augusta Emilia Johansson)	female	38	1	5	347077	31.3875		S
27	0	3	Emir, Mr. Farred Chehab	male		0	0	2631	7.225		C
28	0	1	Fortune, Mr. Charles Alexander	male	19	3	2	19950	263	C23 C25 C2	S
29	1	3	O'Dwyer, Miss. Ellen "Nellie"	female		0	0	330959	7.8792		Q
30	0	3	Todoroff, Mr. Lalio	male		0	0	349216	7.8958		S
31	0	1	Uruchurtu, Don. Manuel E	male	40	0	0	PC 17601	27.7208		C
32	1	1	Spencer, Mrs. William Augustus (Marie Eugenie)	female		1	0	PC 17569	146.5208	B78	C
33	1	3	Glynn, Miss. Mary Agatha	female		0	0	335677	7.75		Q
34	0	2	Wheadon, Mr. Edward H	male	66	0	0	C.A. 2457	10.5		S

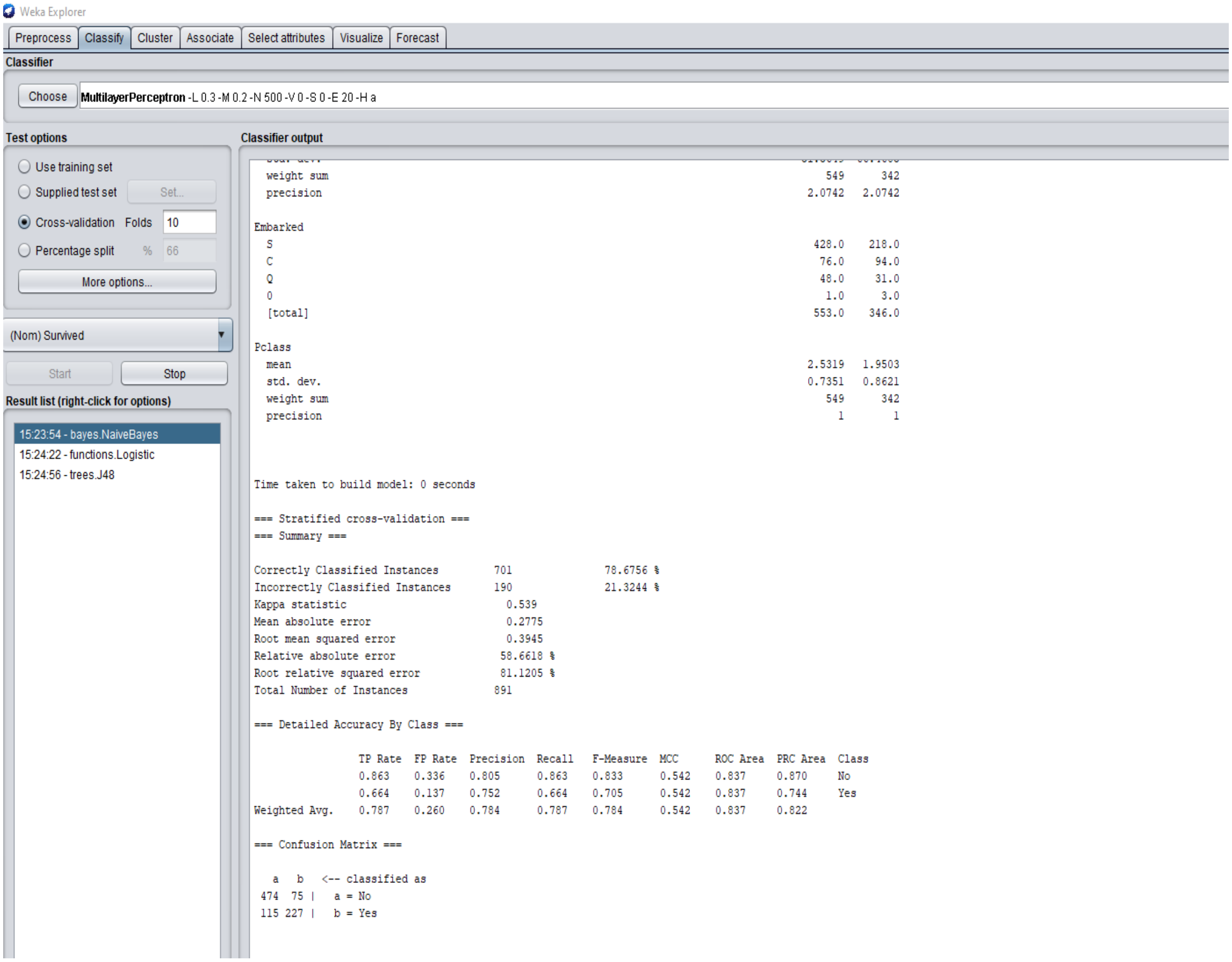
Before pre-processing the titanic dataset



A	B	C	D	E	F	G	H	I	J
PassengerId	**Name**	**Sex**	**Age**	**SibSp**	**Parch**	**Fare**	**Embarked**	**Pclass**	**Survived**
1	Braund Mr. Owen Harris	male	22	1	0	7.25	S	3	No
2	Cumings Mrs. John Bradley Florence Briggs Thayer	female	38	1	0	71.2833	C	1	Yes
3	Heikkinen Miss. Laina	female	26	0	0	7.925	S	3	Yes
4	Futrelle Mrs. Jacques Heath Lily May Peel	female	35	1	0	53.1	S	1	Yes
5	Allen Mr. William Henry	male	35	0	0	8.05	S	3	No
6	Moran Mr. James	male	0	0	0	8.4583	Q	3	No
7	McCarthy Mr. Timothy J	male	54	0	0	51.8625	S	1	No
8	Palsson Master. Gosta Leonard	male	2	3	1	21.075	S	3	No
9	Johnson Mrs. Oscar W Elisabeth Vilhelmina Berg	female	27	0	2	11.1333	S	3	Yes
10	Nasser Mrs. Nicholas Adele Achem	female	14	1	0	30.0708	C	2	Yes
11	Sandstrom Miss. Marguerite Rut	female	4	1	1	16.7	S	3	Yes
12	Bonnell Miss. Elizabeth	female	58	0	0	26.55	S	1	Yes
13	Saundercock Mr. William Henry	male	20	0	0	8.05	S	3	No
14	Andersson Mr. Anders Johan	male	39	1	5	31.275	S	3	No
15	Vestrom Miss. Hulda Amanda Adolfina	female	14	0	0	7.8542	S	3	No
16	Hewlett Mrs. Mary D Kingcome	female	55	0	0	16	S	2	Yes
17	Rice Master. Eugene	male	2	4	1	29.125	Q	3	No
18	Williams Mr. Charles Eugene	male	0	0	0	13	S	2	Yes
19	Vander Planke Mrs. Julius Emelia Maria Vandemoortele	female	31	1	0	18	S	3	No
20	Masselmani Mrs. Fatima	female	0	0	0	7.225	C	3	Yes
21	Fynney Mr. Joseph J	male	35	0	0	26	S	2	No
22	Beesley Mr. Lawrence	male	34	0	0	13	S	2	Yes
23	McGowan Miss. Anna Annie	female	15	0	0	8.0292	Q	3	Yes
24	Sloper Mr. William Thompson	male	28	0	0	35.5	S	1	Yes
25	Palsson Miss. Torborg Danira	female	8	3	1	21.075	S	3	No
26	Asplund Mrs. Carl Oscar Selma Augusta Emilia Johansson	female	38	1	5	31.3875	S	3	Yes
27	Emir Mr. Farred Chehab	male	0	0	0	7.225	C	3	No
28	Fortune Mr. Charles Alexander	male	19	3	2	263	S	1	No
29	O Dwyer Miss. Ellen Nellie	female	0	0	0	7.8792	Q	3	Yes
30	Todoroff Mr. Lalio	male	0	0	0	7.8958	S	3	No
31	Uruchurtu Don. Manuel E	male	40	0	0	27.7208	C	1	No
32	Spencer Mrs. William Augustus Marie Eugenie	female	0	1	0	146.5208	C	1	Yes
33	Glynn Miss. Mary Agatha	female	0	0	0	7.75	Q	3	Yes
34	Wheadon Mr. Edward H	male	66	0	0	10.5	S	2	No

After pre-processing the titanic dataset

3. I have generated 3 models such as Naive Bayes, Logistic and J48. But I have chosen Naïve Bayes models to predict which passengers have high likely to survive.



Classifier

MultilayerPerceptron -L 0.3 -M 0.2 -N 500 -V 0 -S 0 -E 20 -H a

Test options

○ Use training set
○ Supplied test set
● Cross-validation Folds 10
○ Percentage split % 66

(Nom) Survived

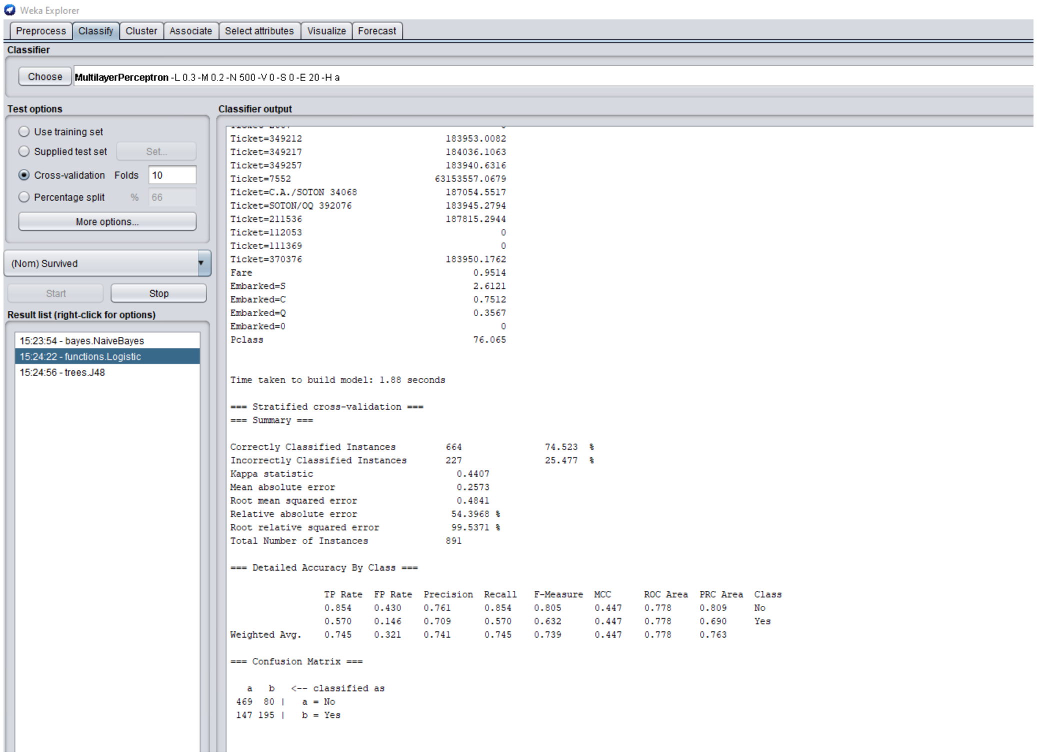
Result list (right-click for options)

15:23:54 - bayes.NaiveBayes
15:24:22 - functions.Logistic
15:24:56 - trees.J48

Classifier output

```
  weight sum                                                        549      342
  precision                                                      2.0742   2.0742

Embarked
  S                                                               428.0    218.0
  C                                                                76.0     94.0
  Q                                                                48.0     31.0
  0                                                                 1.0      3.0
  [total]                                                         553.0    346.0

Pclass
  mean                                                           2.5319   1.9503
  std. dev.                                                      0.7351   0.8621
  weight sum                                                        549      342
  precision                                                           1        1



Time taken to build model: 0 seconds

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances         701               78.6756 %
Incorrectly Classified Instances       190               21.3244 %
Kappa statistic                          0.539
Mean absolute error                      0.2775
Root mean squared error                  0.3945
Relative absolute error                 58.6618 %
Root relative squared error             81.1205 %
Total Number of Instances              891

=== Detailed Accuracy By Class ===

                 TP Rate  FP Rate  Precision  Recall   F-Measure  MCC      ROC Area  PRC Area  Class
                 0.863    0.336    0.805      0.863    0.833      0.542    0.837     0.870     No
                 0.664    0.137    0.752      0.664    0.705      0.542    0.837     0.744     Yes
Weighted Avg.    0.787    0.260    0.784      0.787    0.784      0.542    0.837     0.822

=== Confusion Matrix ===

   a   b   <-- classified as
 474  75 |   a = No
 115 227 |   b = Yes
```

Figure: Naïve Bayes model



Classifier

MultilayerPerceptron -L 0.3 -M 0.2 -N 500 -V 0 -S 0 -E 20 -H a

Test options

○ Use training set
○ Supplied test set
● Cross-validation Folds 10
○ Percentage split % 66

(Nom) Survived

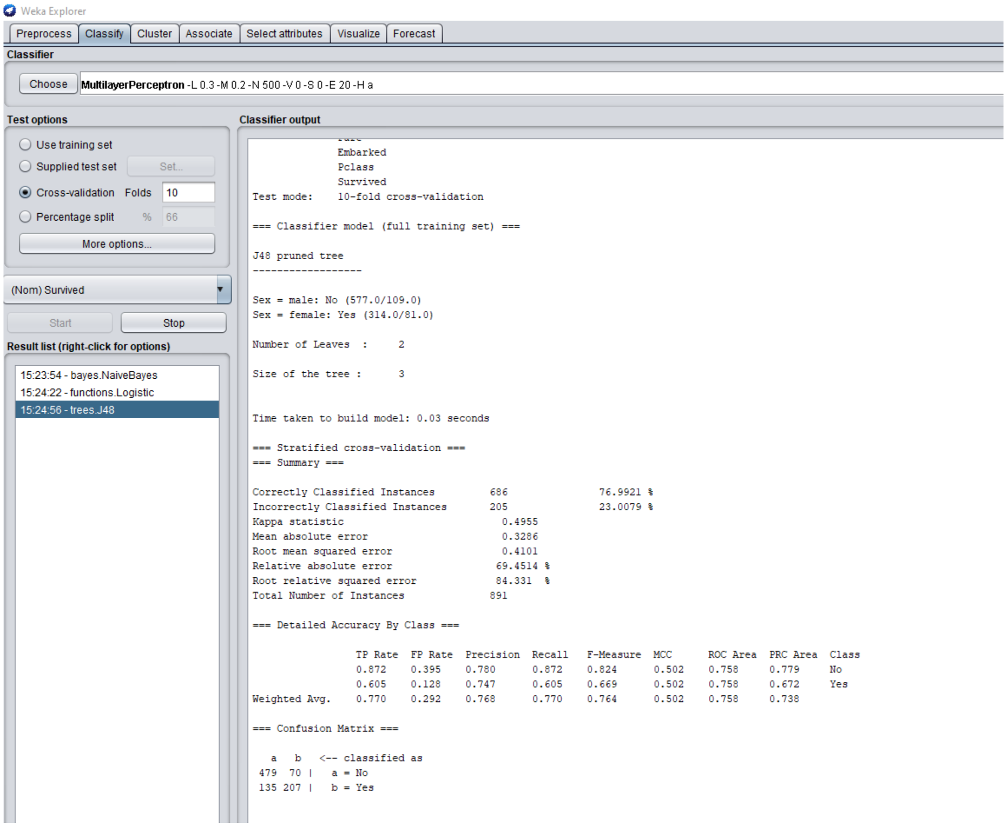
Result list (right-click for options)

```
15:23:54 - bayes.NaiveBayes
15:24:22 - functions.Logistic
15:24:56 - trees.J48
```

Classifier output

```
Ticket=349212                        183953.0082
Ticket=349217                        184036.1063
Ticket=349257                        183940.6316
Ticket=7552                         63153557.0679
Ticket=C.A./SOTON 34068              187054.5517
Ticket=SOTON/OQ 392076               183945.2794
Ticket=211536                        187815.2944
Ticket=112053                                  0
Ticket=111369                                  0
Ticket=370376                        183950.1762
Fare                                      0.9514
Embarked=S                                2.6121
Embarked=C                                0.7512
Embarked=Q                                0.3567
Embarked=0                                     0
Pclass                                    76.065


Time taken to build model: 1.88 seconds

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances         664               74.523  %
Incorrectly Classified Instances       227               25.477  %
Kappa statistic                          0.4407
Mean absolute error                      0.2573
Root mean squared error                  0.4841
Relative absolute error                 54.3968 %
Root relative squared error             99.5371 %
Total Number of Instances              891

=== Detailed Accuracy By Class ===

                 TP Rate  FP Rate  Precision  Recall   F-Measure  MCC      ROC Area  PRC Area  Class
                 0.854    0.430    0.761      0.854    0.805      0.447    0.778     0.809     No
                 0.570    0.146    0.709      0.570    0.632      0.447    0.778     0.690     Yes
Weighted Avg.    0.745    0.321    0.741      0.745    0.739      0.447    0.778     0.763

=== Confusion Matrix ===

   a   b   <-- classified as
 469  80 |   a = No
 147 195 |   b = Yes
```

Figure: Logistic model



Classifier

MultilayerPerceptron -L 0.3 -M 0.2 -N 500 -V 0 -S 0 -E 20 -H a

Test options

○ Use training set
○ Supplied test set
● Cross-validation Folds 10
○ Percentage split % 66

(Nom) Survived

Result list (right-click for options)

```
15:23:54 - bayes.NaiveBayes
15:24:22 - functions.Logistic
15:24:56 - trees.J48
```

Classifier output

```
              Embarked
              Pclass
              Survived
Test mode:    10-fold cross-validation

=== Classifier model (full training set) ===

J48 pruned tree
------------------

Sex = male: No (577.0/109.0)
Sex = female: Yes (314.0/81.0)

Number of Leaves  :     2

Size of the tree :      3


Time taken to build model: 0.03 seconds

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances         686               76.9921 %
Incorrectly Classified Instances       205               23.0079 %
Kappa statistic                          0.4955
Mean absolute error                      0.3286
Root mean squared error                  0.4101
Relative absolute error                 69.4514 %
Root relative squared error             84.331  %
Total Number of Instances              891

=== Detailed Accuracy By Class ===

                 TP Rate  FP Rate  Precision  Recall   F-Measure  MCC      ROC Area  PRC Area  Class
                 0.872    0.395    0.780      0.872    0.824      0.502    0.758     0.779     No
                 0.605    0.128    0.747      0.605    0.669      0.502    0.758     0.672     Yes
Weighted Avg.    0.770    0.292    0.768      0.770    0.764      0.502    0.758     0.738

=== Confusion Matrix ===

   a   b   <-- classified as
 479  70 |   a = No
 135 207 |   b = Yes
```

Figure: J48 model

4. In Naïve Bayes model, after using the 10-fold cross validation calculating the accuracy and confusion matrix which can be produced to support that passengers have high likely to survive from the dataset.

NAÏVE BAYES

```
=== Confusion Matrix ===

   a   b   <-- classified as
 474 75 |   a = No
 115 227 |   b = Yes
```

From the confusion matrix we can say that,

TP = 474

FP =75

TN = 227

FN = 115

Accuracy = TP +TN / TP + FP + FN + TN

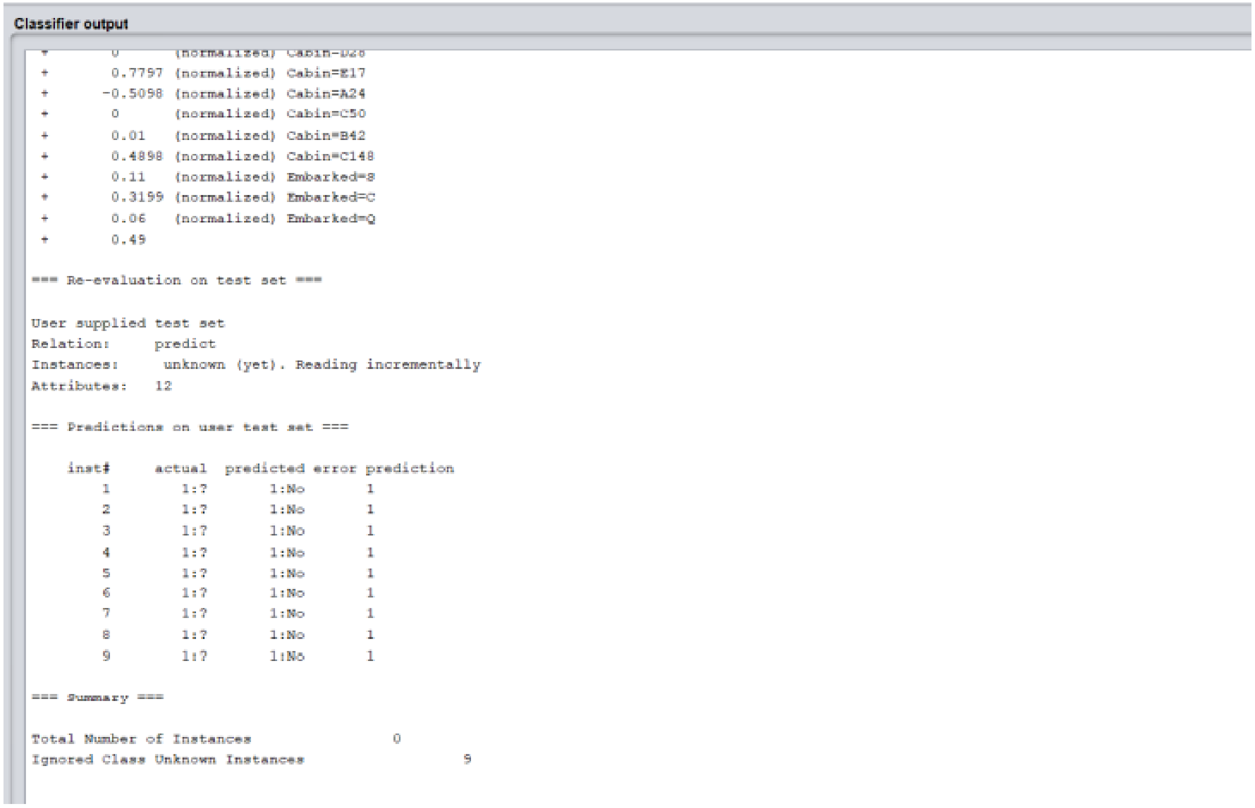
= 474 + 227 / 474 + 75 + 115 + 227

= 701 / 891

= 0.79

According to the calculation, Naïve Bayes has 0.79 or 79% accuracy of survivors.

5.



```
 +       0      (normalized) Cabin=D28
 +       0.7797 (normalized) Cabin=E17
 +      -0.5098 (normalized) Cabin=A24
 +       0      (normalized) Cabin=C50
 +       0.01   (normalized) Cabin=B42
 +       0.4898 (normalized) Cabin=C148
 +       0.11   (normalized) Embarked=S
 +       0.3199 (normalized) Embarked=C
 +       0.06   (normalized) Embarked=Q
 +       0.49

=== Re-evaluation on test set ===

User supplied test set
Relation:     predict
Instances:     unknown (yet). Reading incrementally
Attributes:   12

=== Predictions on user test set ===

    inst#     actual  predicted error prediction
        1        1:?       1:No       1
        2        1:?       1:No       1
        3        1:?       1:No       1
        4        1:?       1:No       1
        5        1:?       1:No       1
        6        1:?       1:No       1
        7        1:?       1:No       1
        8        1:?       1:No       1
        9        1:?       1:No       1

=== Summary ===

Total Number of Instances                0
Ignored Class Unknown Instances                  9
```

According to the screenshot above, I used Function SGD to get the prediction:

inst# actual predicted error prediction

1 1:? 1:No 1

2 1:? 1:No 1

3 1:? 1:No 1

4 1:? 1:No 1

5 1:? 1:No 1

6 1:? 1:No 1

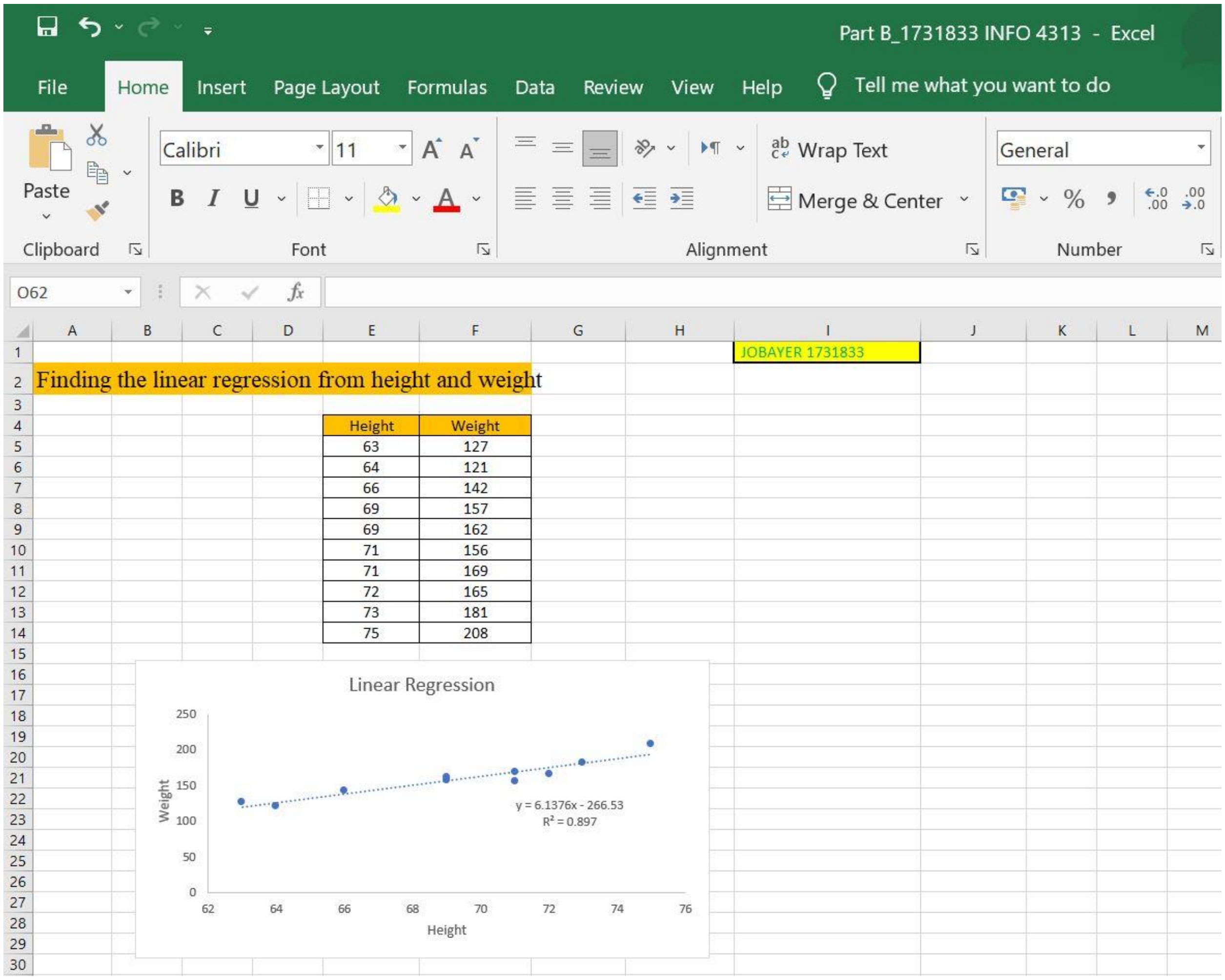
7 1:? 1:No 1

8 1:? 1:No 1

9 1:? 1:No 1

PART 2:

LINEAR REGRESSION:



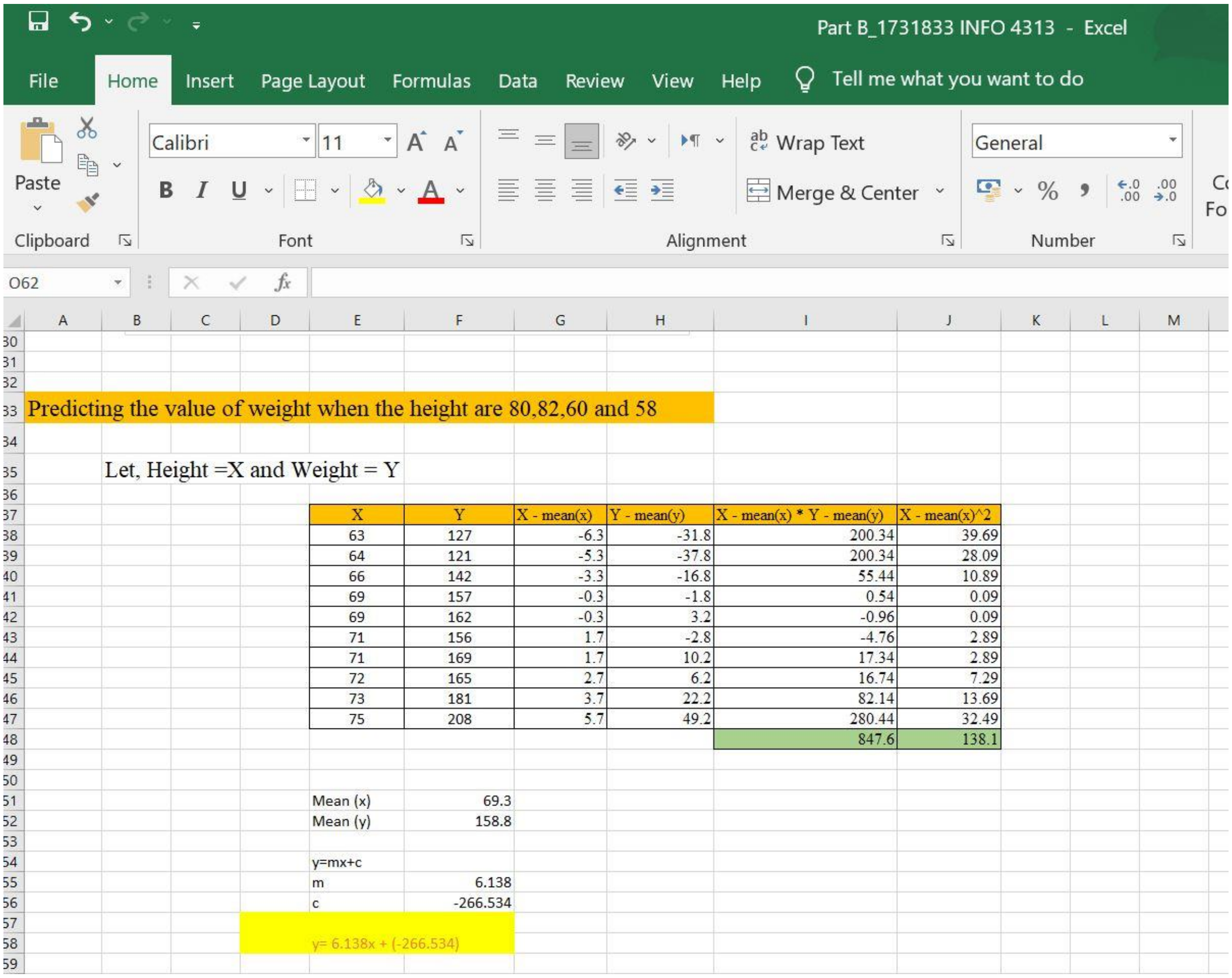
JOBAYER 1731833

Finding the linear regression from height and weight

Height	Weight
63	127
64	121
66	142
69	157
69	162
71	156
71	169
72	165
73	181
75	208

$y = 6.1376x - 266.53$

$R^2 = 0.897$



Predicting the value of weight when the height are 80,82,60 and 58

Let, Height =X and Weight = Y

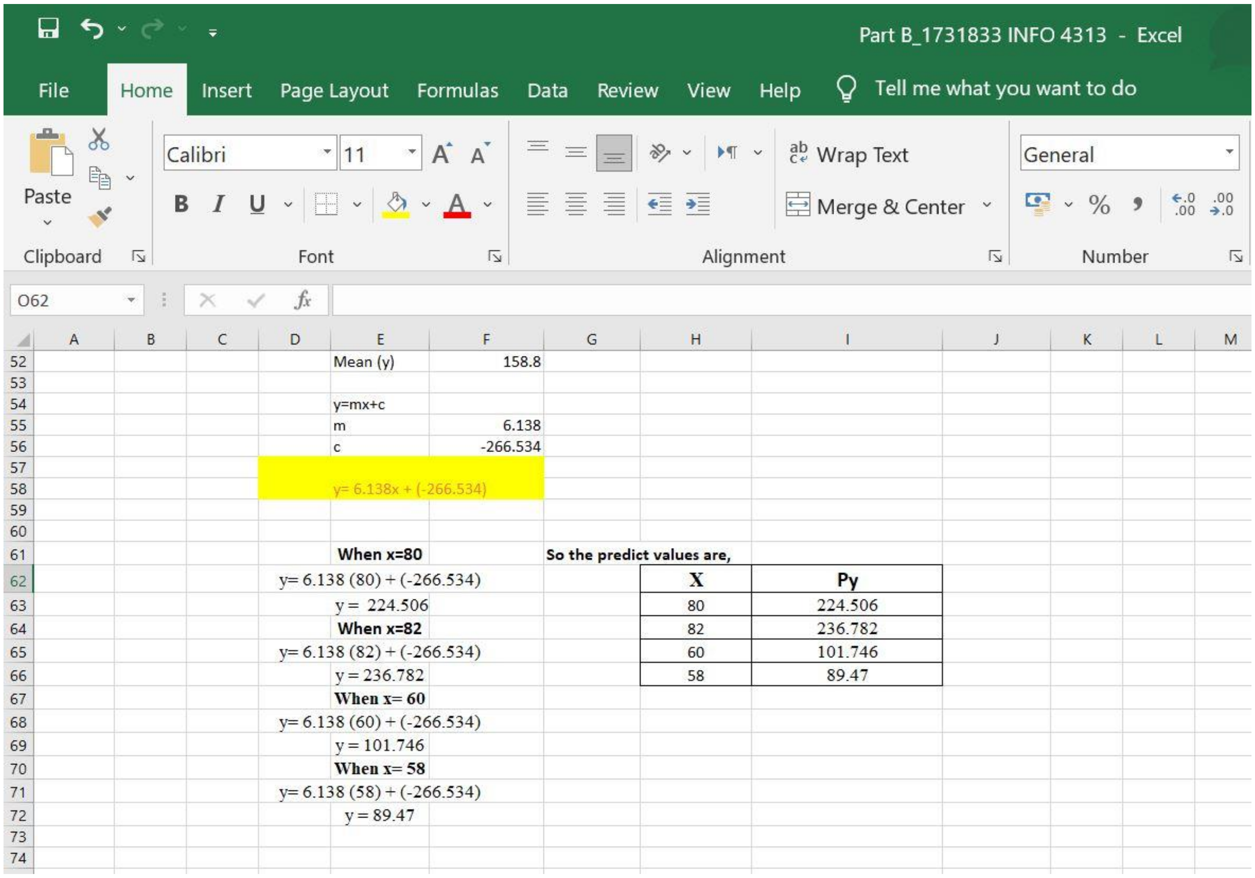
X	Y	X - mean(x)	Y - mean(y)	X - mean(x) * Y - mean(y)	X - mean(x)^2
63	127	-6.3	-31.8	200.34	39.69
64	121	-5.3	-37.8	200.34	28.09
66	142	-3.3	-16.8	55.44	10.89
69	157	-0.3	-1.8	0.54	0.09
69	162	-0.3	3.2	-0.96	0.09
71	156	1.7	-2.8	-4.76	2.89
71	169	1.7	10.2	17.34	2.89
72	165	2.7	6.2	16.74	7.29
73	181	3.7	22.2	82.14	13.69
75	208	5.7	49.2	280.44	32.49
				847.6	138.1

Mean (x)	69.3
Mean (y)	158.8

y=mx+c

m	6.138
c	-266.534

y= 6.138x + (-266.534)



Mean (y) 158.8

y=mx+c

m 6.138

c -266.534

y= 6.138x + (-266.534)

When x=80

y= 6.138 (80) + (-266.534)

y = 224.506

When x=82

y= 6.138 (82) + (-266.534)

y = 236.782

When x= 60

y= 6.138 (60) + (-266.534)

y = 101.746

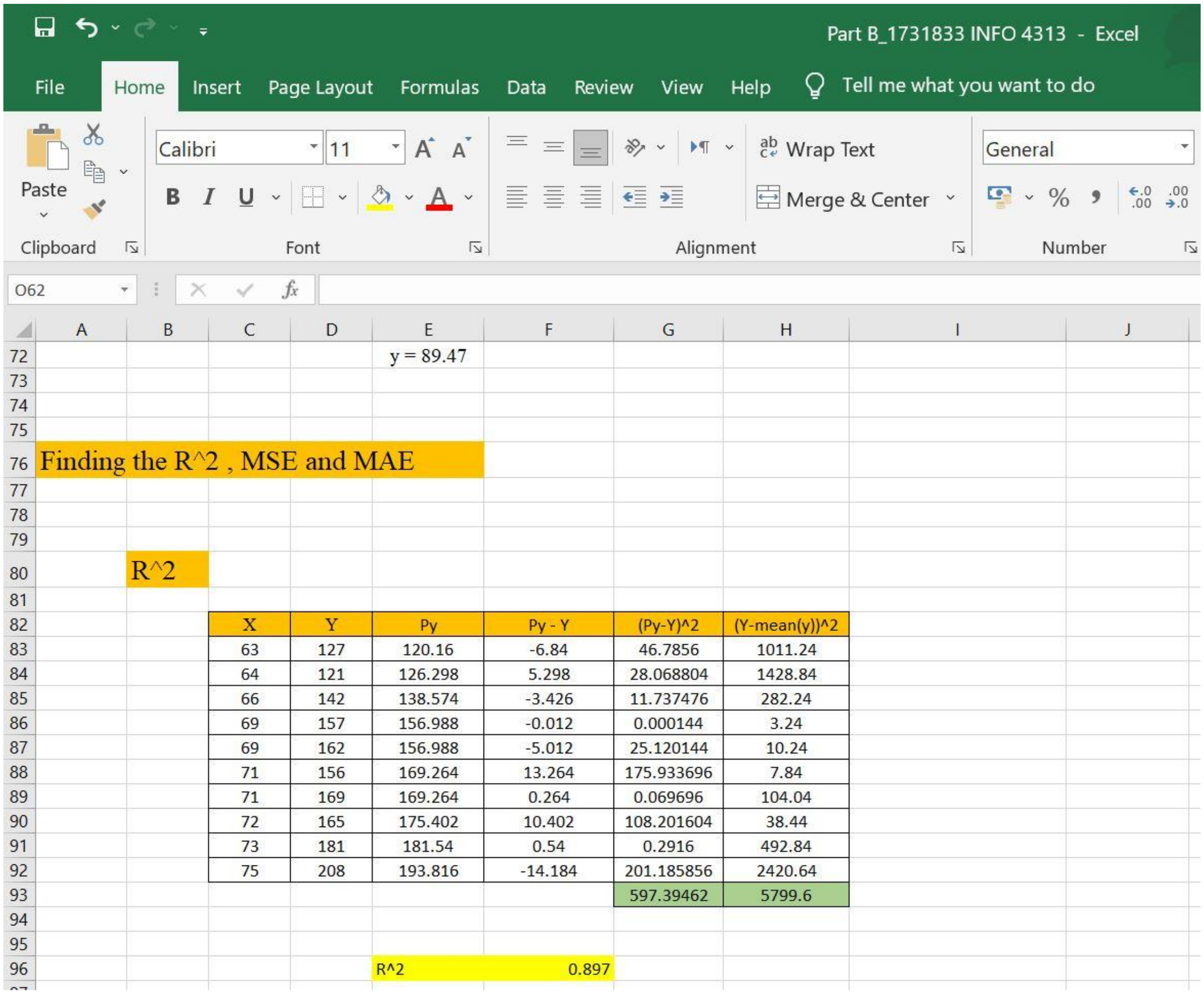
When x= 58

y= 6.138 (58) + (-266.534)

y = 89.47

So the predict values are,

X	Py
80	224.506
82	236.782
60	101.746
58	89.47



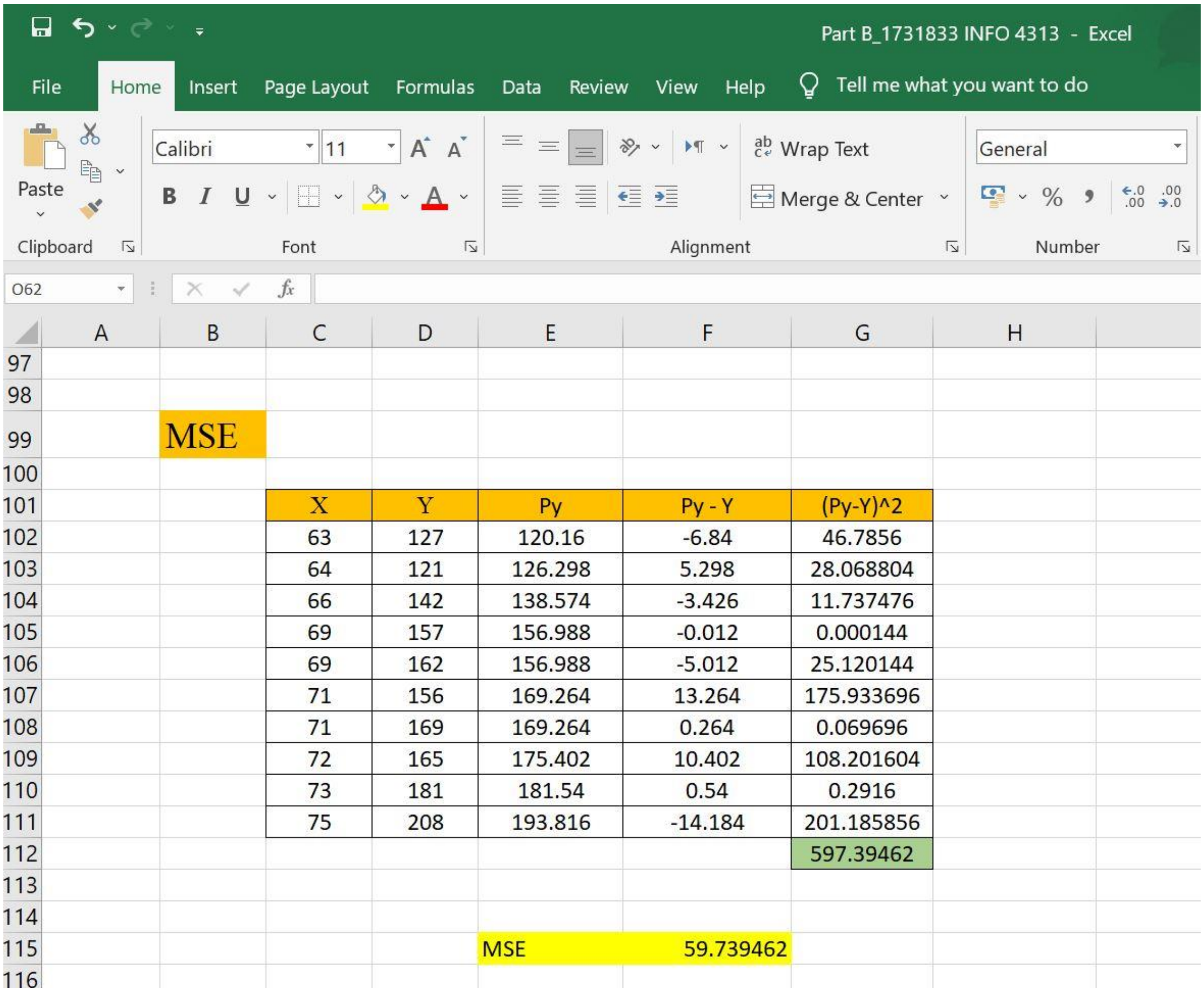
y = 89.47

Finding the R^2 , MSE and MAE

R^2

X	Y	Py	Py - Y	(Py-Y)^2	(Y-mean(y))^2
63	127	120.16	-6.84	46.7856	1011.24
64	121	126.298	5.298	28.068804	1428.84
66	142	138.574	-3.426	11.737476	282.24
69	157	156.988	-0.012	0.000144	3.24
69	162	156.988	-5.012	25.120144	10.24
71	156	169.264	13.264	175.933696	7.84
71	169	169.264	0.264	0.069696	104.04
72	165	175.402	10.402	108.201604	38.44
73	181	181.54	0.54	0.2916	492.84
75	208	193.816	-14.184	201.185856	2420.64
				597.39462	5799.6

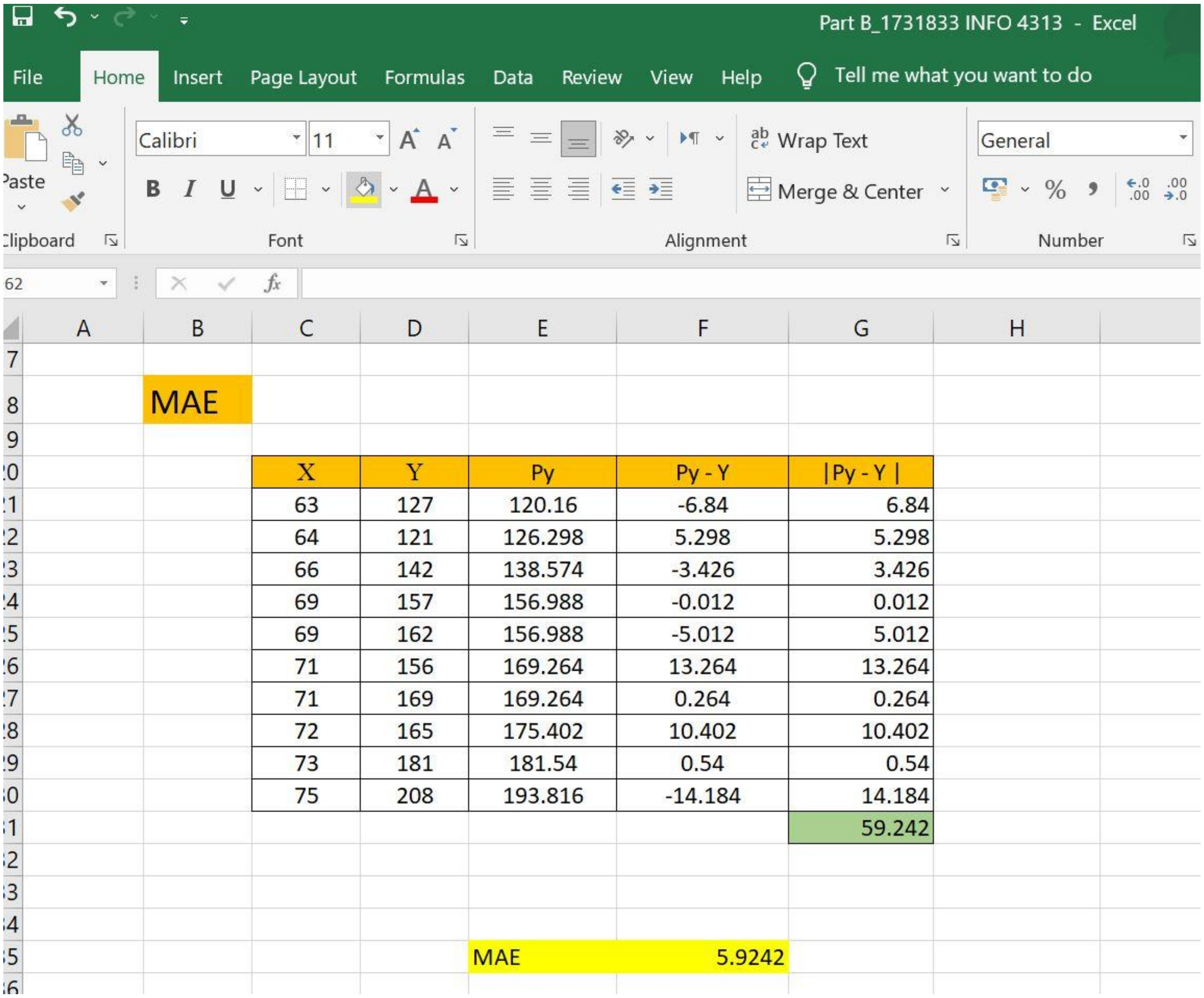
R^2 0.897



MSE

X	Y	Py	Py - Y	(Py-Y)^2
63	127	120.16	-6.84	46.7856
64	121	126.298	5.298	28.068804
66	142	138.574	-3.426	11.737476
69	157	156.988	-0.012	0.000144
69	162	156.988	-5.012	25.120144
71	156	169.264	13.264	175.933696
71	169	169.264	0.264	0.069696
72	165	175.402	10.402	108.201604
73	181	181.54	0.54	0.2916
75	208	193.816	-14.184	201.185856
				597.39462

MSE 59.739462

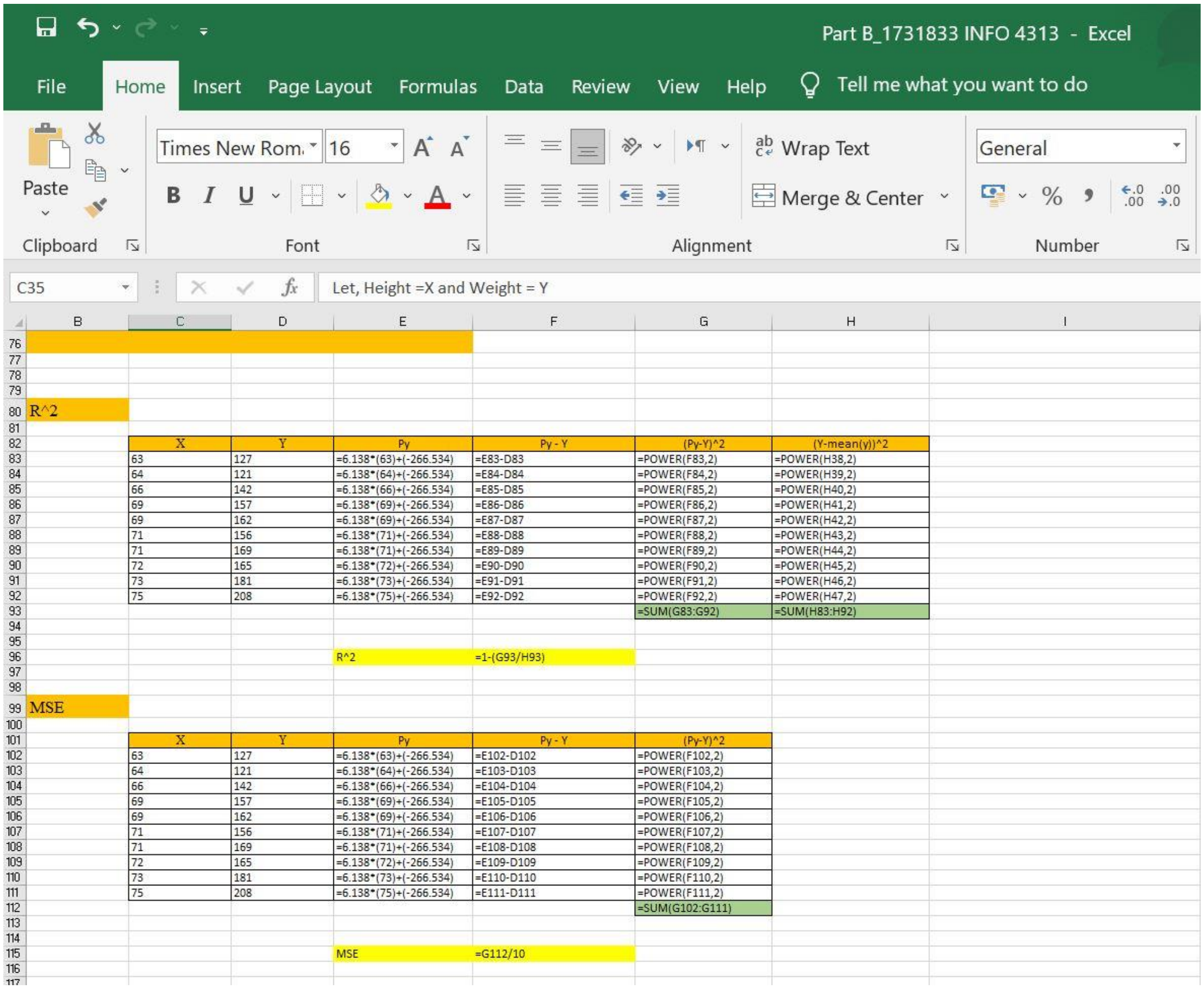


MAE

X	Y	Py	Py - Y	|Py - Y |
63	127	120.16	-6.84	6.84
64	121	126.298	5.298	5.298
66	142	138.574	-3.426	3.426
69	157	156.988	-0.012	0.012
69	162	156.988	-5.012	5.012
71	156	169.264	13.264	13.264
71	169	169.264	0.264	0.264
72	165	175.402	10.402	10.402
73	181	181.54	0.54	0.54
75	208	193.816	-14.184	14.184
				59.242

MAE	5.9242

*** CTRL WITH ~ TO SHOW ALL PROCESS



Let, Height =X and Weight = Y

R^2

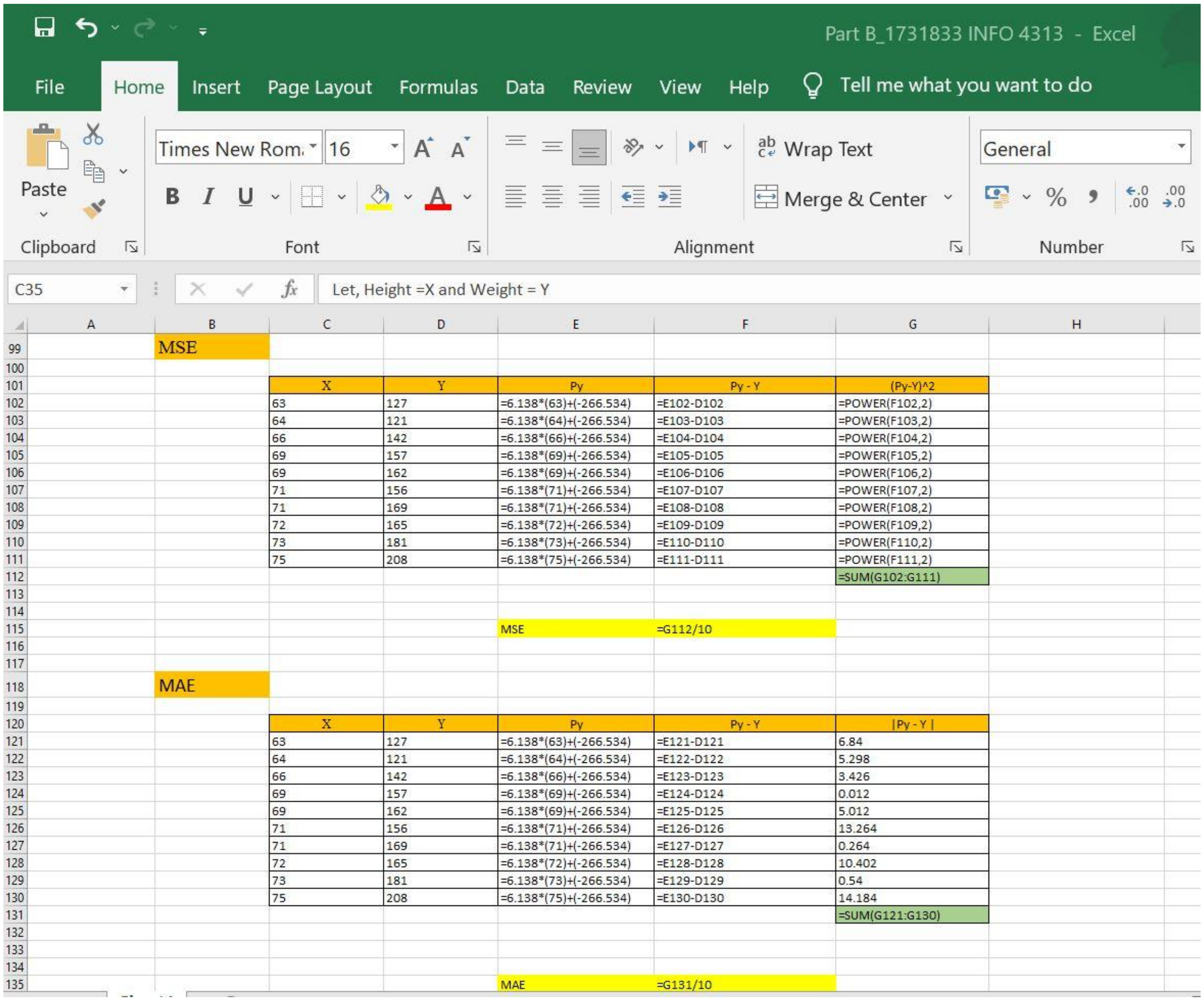
X	Y	Py	Py - Y	(Py-Y)^2	(Y-mean(y))^2
63	127	=6.138*(63)+(-266.534)	=E83-D83	=POWER(F83,2)	=POWER(H38,2)
64	121	=6.138*(64)+(-266.534)	=E84-D84	=POWER(F84,2)	=POWER(H39,2)
66	142	=6.138*(66)+(-266.534)	=E85-D85	=POWER(F85,2)	=POWER(H40,2)
69	157	=6.138*(69)+(-266.534)	=E86-D86	=POWER(F86,2)	=POWER(H41,2)
69	162	=6.138*(69)+(-266.534)	=E87-D87	=POWER(F87,2)	=POWER(H42,2)
71	156	=6.138*(71)+(-266.534)	=E88-D88	=POWER(F88,2)	=POWER(H43,2)
71	169	=6.138*(71)+(-266.534)	=E89-D89	=POWER(F89,2)	=POWER(H44,2)
72	165	=6.138*(72)+(-266.534)	=E90-D90	=POWER(F90,2)	=POWER(H45,2)
73	181	=6.138*(73)+(-266.534)	=E91-D91	=POWER(F91,2)	=POWER(H46,2)
75	208	=6.138*(75)+(-266.534)	=E92-D92	=POWER(F92,2)	=POWER(H47,2)
				=SUM(G83:G92)	=SUM(H83:H92)

R^2	=1-(G93/H93)

MSE

X	Y	Py	Py - Y	(Py-Y)^2
63	127	=6.138*(63)+(-266.534)	=E102-D102	=POWER(F102,2)
64	121	=6.138*(64)+(-266.534)	=E103-D103	=POWER(F103,2)
66	142	=6.138*(66)+(-266.534)	=E104-D104	=POWER(F104,2)
69	157	=6.138*(69)+(-266.534)	=E105-D105	=POWER(F105,2)
69	162	=6.138*(69)+(-266.534)	=E106-D106	=POWER(F106,2)
71	156	=6.138*(71)+(-266.534)	=E107-D107	=POWER(F107,2)
71	169	=6.138*(71)+(-266.534)	=E108-D108	=POWER(F108,2)
72	165	=6.138*(72)+(-266.534)	=E109-D109	=POWER(F109,2)
73	181	=6.138*(73)+(-266.534)	=E110-D110	=POWER(F110,2)
75	208	=6.138*(75)+(-266.534)	=E111-D111	=POWER(F111,2)
				=SUM(G102:G111)

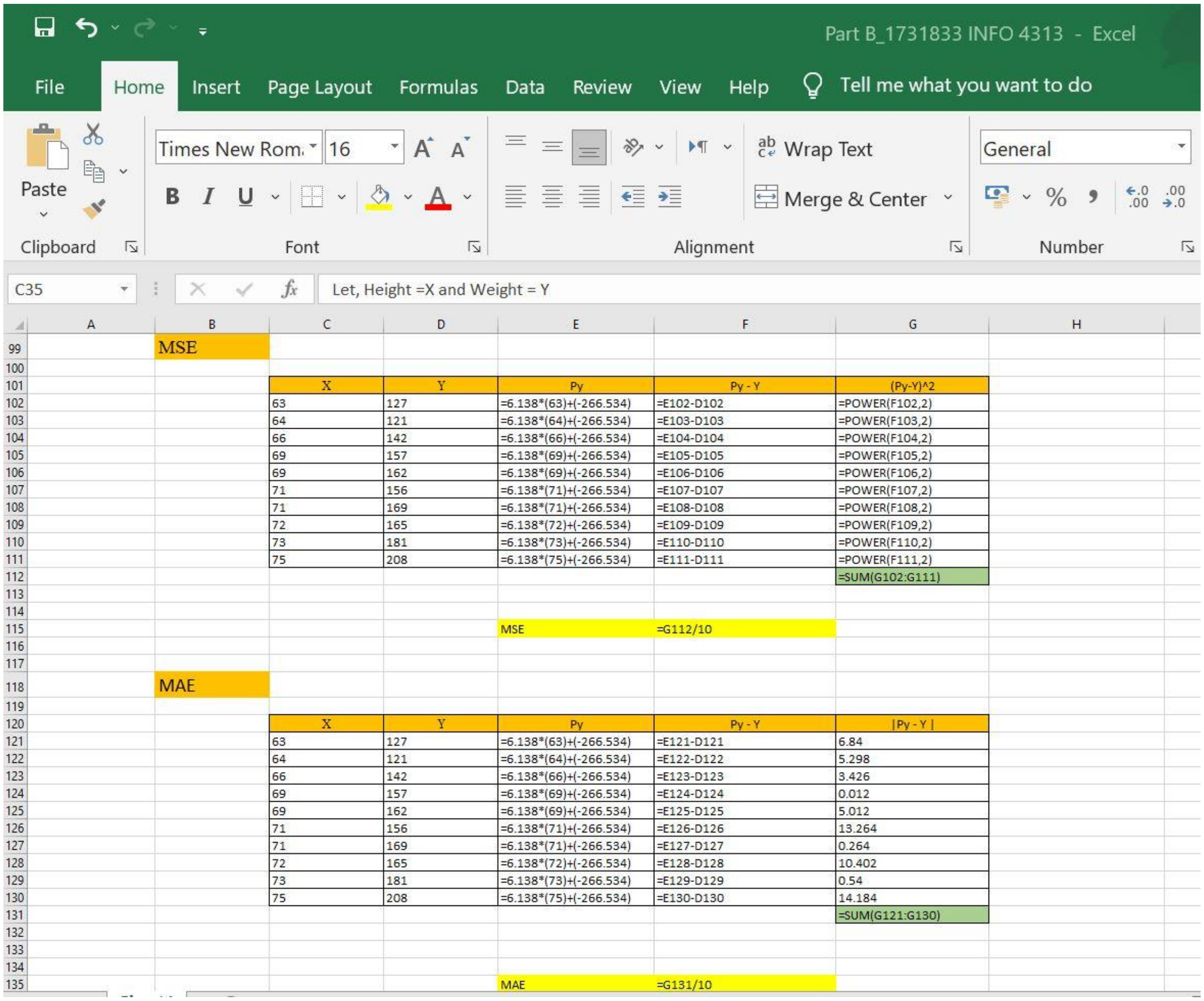
MSE	=G112/10



C35

Let, Height =X and Weight = Y

	A	B	C	D	E	F	G	H
99		MSE						
100								
101			X	Y	Py	Py - Y	(Py-Y)^2	
102			63	127	=6.138*(63)+(-266.534)	=E102-D102	=POWER(F102,2)	
103			64	121	=6.138*(64)+(-266.534)	=E103-D103	=POWER(F103,2)	
104			66	142	=6.138*(66)+(-266.534)	=E104-D104	=POWER(F104,2)	
105			69	157	=6.138*(69)+(-266.534)	=E105-D105	=POWER(F105,2)	
106			69	162	=6.138*(69)+(-266.534)	=E106-D106	=POWER(F106,2)	
107			71	156	=6.138*(71)+(-266.534)	=E107-D107	=POWER(F107,2)	
108			71	169	=6.138*(71)+(-266.534)	=E108-D108	=POWER(F108,2)	
109			72	165	=6.138*(72)+(-266.534)	=E109-D109	=POWER(F109,2)	
110			73	181	=6.138*(73)+(-266.534)	=E110-D110	=POWER(F110,2)	
111			75	208	=6.138*(75)+(-266.534)	=E111-D111	=POWER(F111,2)	
112							=SUM(G102:G111)	
113								
114								
115					MSE	=G112/10		
116								
117								
118		MAE						
119								
120			X	Y	Py	Py - Y	|Py - Y |	
121			63	127	=6.138*(63)+(-266.534)	=E121-D121	6.84	
122			64	121	=6.138*(64)+(-266.534)	=E122-D122	5.298	
123			66	142	=6.138*(66)+(-266.534)	=E123-D123	3.426	
124			69	157	=6.138*(69)+(-266.534)	=E124-D124	0.012	
125			69	162	=6.138*(69)+(-266.534)	=E125-D125	5.012	
126			71	156	=6.138*(71)+(-266.534)	=E126-D126	13.264	
127			71	169	=6.138*(71)+(-266.534)	=E127-D127	0.264	
128			72	165	=6.138*(72)+(-266.534)	=E128-D128	10.402	
129			73	181	=6.138*(73)+(-266.534)	=E129-D129	0.54	
130			75	208	=6.138*(75)+(-266.534)	=E130-D130	14.184	
131							=SUM(G121:G130)	
132								
133								
134								
135					MAE	=G131/10		



C35 Let, Height =X and Weight = Y

MSE

X	Y	Py	Py - Y	(Py-Y)^2
63	127	=6.138*(63)+(-266.534)	=E102-D102	=POWER(F102,2)
64	121	=6.138*(64)+(-266.534)	=E103-D103	=POWER(F103,2)
66	142	=6.138*(66)+(-266.534)	=E104-D104	=POWER(F104,2)
69	157	=6.138*(69)+(-266.534)	=E105-D105	=POWER(F105,2)
69	162	=6.138*(69)+(-266.534)	=E106-D106	=POWER(F106,2)
71	156	=6.138*(71)+(-266.534)	=E107-D107	=POWER(F107,2)
71	169	=6.138*(71)+(-266.534)	=E108-D108	=POWER(F108,2)
72	165	=6.138*(72)+(-266.534)	=E109-D109	=POWER(F109,2)
73	181	=6.138*(73)+(-266.534)	=E110-D110	=POWER(F110,2)
75	208	=6.138*(75)+(-266.534)	=E111-D111	=POWER(F111,2)
				=SUM(G102:G111)

MSE	=G112/10

MAE

X	Y	Py	Py - Y	|Py - Y |
63	127	=6.138*(63)+(-266.534)	=E121-D121	6.84
64	121	=6.138*(64)+(-266.534)	=E122-D122	5.298
66	142	=6.138*(66)+(-266.534)	=E123-D123	3.426
69	157	=6.138*(69)+(-266.534)	=E124-D124	0.012
69	162	=6.138*(69)+(-266.534)	=E125-D125	5.012
71	156	=6.138*(71)+(-266.534)	=E126-D126	13.264
71	169	=6.138*(71)+(-266.534)	=E127-D127	0.264
72	165	=6.138*(72)+(-266.534)	=E128-D128	10.402
73	181	=6.138*(73)+(-266.534)	=E129-D129	0.54
75	208	=6.138*(75)+(-266.534)	=E130-D130	14.184
				=SUM(G121:G130)

MAE	=G131/10