```
In [468]: import numpy as np import pandas as pd import matplotlib.pyplot as plt
In [469]: trainset = pd.read_csv('/home/lavahawk0123/Documents/Tasks-MRM/Tasks-ADMIN/Task 2 Logistic Regression/titanic_train.csv', sep= ",")
In [470]: trainset.head(n=892)
Out[470]:
                                                                                                                                          Name Sex Age SibSp Parch
                                                                                                                                                                               1 0 A/5 21171 7.2500
1 0 PC 17599 71.2833
                                                                                                                  Braund, Mr. Owen Harris
                                                                          1 Cumings, Mrs. John Bradley (Florence Briggs Th... female 38.0
                                                                                                                  Heikkinen, Miss. Laina female 26.0 0 0 STON/O2. 3101282 7.9250
                                                                                                                                                                                                                                                        NaN
                                                                                                                                                                                                         113803 53.1000
                                                                                      Futrelle, Mrs. Jacques Heath (Lily May Peel) female 35.0 1 0
                                                                                                                                                                                                                                                        C123
                                                                                                              Allen, Mr. William Henry male 35.0 0 0
                                                                                                                                                                                                           330877 8.4583
17463 51.8625
349909 21.0750
                                                                                                                          Moran, Mr. James male NaN 0 0
                                                                                                                McCarthy, Mr. Timothy J male 54.0 0 0
                                                         Palsson, Master. Gosta Leonard male 2.0 3 1
                                                                                          on, Mrs. Oscar W (Elisabeth Vilhelmina Berg) female 27.0 0 2

Nasser, Mrs. Nicholas (Adele Achem) female 14.0 1 0
                                                                                                                                                                                                               347742 11.1333
                                                                                                                                                                                                               237736 30.0708
                                                                                           Sandstrom, Miss. Marguerte Ruf female 4.0 1 1
Bonnell, Miss. Elizabeth female 58.0 0 0
Saundercook, Mr. William Henry male 20.0 0 0
                                                                                                                                                                                                              PP 9549 16.7000
                        11
                                                                                                                                                                                                                 113783 26.5500
                                                                                                                                                                                                                                                         C103
                        12
                                                                                                                                                                                                              A/5. 2151 8.0500
                                                                                                                                                                                                           347082 31.2750
350406 7.8542
                                                                                        Vestrom, Miss. Hulda Amanda Adolfina female 14.0
                                                                                                                                                                                                               248706 16.0000
                        15
                                                                                                     Hewlett, Mrs. (Mary D Kingcome) female 55.0
                        16
                                                                                                                     Rice, Master. Eugene male 2.0 4 1
                                                                                                                                                                                                                 382652 29.1250
                                                                                                           Williams, Mr. Charles Eugene male NaN 0 0
                                                                                                                                                                                                               244373 13.0000
                        17
                                                                                                        Masselmani, Mrs. Fatima female NaN
                                                                                                                                                                                                                     2649 7.2250
                                                                                                                                                                                                          239865 26.0000
                        20
                                                                                                                   Fynney, Mr. Joseph J male 35.0
                                                                                                                  Beesley, Mr. Lawrence male 34.0
                                                                                                                                                                                                                248698 13.0000
                        21
                                                                                                                                                                                                            330923 8.0292
113788 35.5000
                                                                                                        McGowan, Miss. Anna "Annie" female 15.0
                                                                                                           Sloper, Mr. William Thompson male 28.0
                        24

        0
        3
        Palsson, Miss. Torborg Danira female
        8.0

        1
        3
        Asplund, Mrs. Carl Oscar (Selma Augusta Emilia... female
        38.0

        0
        3
        Emir, Mr. Farred Chehab
        male
        NaN

                                                                                                                                                                                                               349909 21.0750
                        25
                                                                                                                                                                                                               347077 31.3875
                                                                                                                                                                                                                                                           NaN
                                                                                                                                                                                                                      2631 7.2250
                                                                                                                                                                                                                19950 263.0000 C23 C25 C27
                                                                                                   Fortune, Mr. Charles Alexander male 19.0
                                                                                                             O'Dwyer, Miss. Ellen "Nellie" female NaN
                                                                                                                            Miss. Ellen "Nellie" female NaN 0 0

Todoroff, Mr. Lalio male NaN 0 0
                                                                                                                                                                                                                 330959 7.8792
                        29
                                           30
                                                                                                                                                                                                                 349216 7.8958
                                                                                                           Giles, Mr. Frederick Edward male 21.0 1 0
                                                                                                                                                                                                                   28134 11.5000
                                                                                                                                                                                                                    17466 25.9292
                                                                                                                                                                                                         CA. 2343 69.5500
                       863
                       864
                                                                                                                                                                                                                 233866 13.0000
                                                                                                                  Bystrom, Mrs. (Karolina) female 42.0 0 0
                                                                                                                                                                                                                 236852 13.0000
                       865

        1
        2
        Duran y More, Miss. Asuncion
        female
        27.0

        0
        1
        Roebling, Mr. Washington Augustus II
        male
        31.0

        0
        3
        van Melkebeke, Mr. Philemon
        male
        8.0

        1
        3
        Johnson, Master, Harold Theodor
        male
        4.0

        1
        1
        Beakwith, Mrs. Richard Leonard (Sallie Monypeny)
        female
        47.0

        0
        1
        Cardsson, Mr. Frans Old
        male
        47.0

        1
        2
        Abelson, Mrs. Samuel (Hannah Wizosisy)
        female
        28.0

        1
        3
        Najib, Miss. Adele Kiamie "Jane"
        female
        29.0

        0
        3
        Gustafsson, Mr. Alfred Ossian
        male
        20.0

        0
        3
        Pettoff, Mr. Nedelio
        male
        19.0

        0
        3
        Laleff, Mr. Kristo
        male
        56.0

                                                                                        Roebling, Mr. Washington Augustus II male 31.0 0 0
                                                                                                                                                                                                         PC 17590 50.4958
                       868
                                           869
                                                                                                                                                                                                                345777 9.5000
                                                                                                                                                                                                                                                           NaN
                       869
                                           870
                                                                                                                                                                                                                347742 11.1333
                                                                                                                             Balkic, Mr. Cerin male 26.0 0 0
(Sallie Monypeny) female 47.0 1 1
                                                                                                                                                                                                            349248 7.8958
11751 52.5542
                                                                                                                                                                                                                      695 5.0000 B51 B53 B55
                                                                                                           Vander Cruyssen, Mr. Victor male 47.0 0 0
                       873
                                          874
                                                                                                                                                                                                                 345765 9.0000
                                                                                                                                                                                                                                                         NaN
                                                                                   Abelson, Mrs. Samuel (Hannah Wizosky) female 28.0 1 0
                       874
                                                                                                                                                                                                          P/PP 3381 24.0000
                                                                                       Najib, Miss. Adele Kiamie "Jane" female 15.0 0 0
Gustafsson, Mr. Alfred Ossian male 20.0 0 0
                       876

        Petroff, Mr. Nedelio
        male
        19.0
        0
        0

        Laleff, Mr. Kristo
        male
        NaN
        0
        0

                       877
                                          878
                                                                                                                                                                                                          349212 7.8958
349217 7.8958
                       878
                                         879

        879
        0
        3
        Laleff, Mr. Kristo
        male
        NaN
        0
        0
        349217
        7.8958

        880
        1
        1
        Potter, Mrs. Thomas Jr. (Lijly Alexenia Wilson)
        Fernale
        6.0
        0
        1
        11767
        83.1583

        881
        1
        2
        Shelley, Mrs. William (Imanita Parrish Hall)
        fernale
        25.0
        0
        1
        230433
        26.0000

        882
        0
        3
        Duhlberg, Miss. Gerda Ulrika
        fernale
        22.0
        0
        0
        349257
        7.8958

        883
        0
        3
        Duhlberg, Miss. Gerda Ulrika
        fernale
        22.0
        0
        0
        7.552
        10.5167

        884
        0
        2
        Banfileid, Mr. Ferderick James
        male
        28.0
        0
        0
        C.A./SOTON 34088
        10.5000

        886
        0
        3
        Rice, Mrs. William (Margaret Notron)
        fernale
        29.0
        0
        5
        S0TON/OQ 392076
        7.0500

        887
        0
        2
        Monthvila, Rev. Juozas
        male
        27.0
        0
        0

                       879
                       881
                       882
                       883
                       886
                       887
                     891 rows × 12 columns
                    #Function to replace null ages with average value of age def add_age(cols):

Age = cols[0]
Pclass = cols[1]
if pd.isnull(Age):
In [471]:
                                       return int(trainset[trainset["Pclass"] == Pclass]["Age"].mean())
                            else:
return Age
In [472]: #Calling the function to replace null age values
trainset["Age"] = trainset[["Age", "Pclass"]].apply(add_age,axis=1)
```

In [473]: trainset

Out[473]:

LIA	Inset											
:	Passengerld	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th	female	38.0	1	0	PC 17599	71.2833	C85	С
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	s
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C123	s
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	NaN	s
5	6	0	3	Moran, Mr. James	male	25.0	0	0	330877	8.4583	NaN	Q
6	7	0	1	McCarthy, Mr. Timothy J	male	54.0	0	0	17463	51.8625	E46	S
7	8	0	3	Palsson, Master. Gosta Leonard	male	2.0	3	1	349909	21.0750	NaN	S
8	9	1	3	Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg)	female	27.0	0	2	347742	11.1333	NaN	S
9	10	1	2	Nasser, Mrs. Nicholas (Adele Achem)	female	14.0	1	0	237736	30.0708	NaN	C
10	11	1	3	Sandstrom, Miss. Marguerite Rut	female	4.0	1	1	PP 9549	16.7000	G6	S
11	12	1	1	Bonnell, Miss. Elizabeth	female	58.0	0	0	113783	26.5500	C103	S
12	13	0	3	Saundercock, Mr. William Henry	male	20.0	0	0	A/5. 2151	8.0500	NaN	S
13	14	0	3	Andersson, Mr. Anders Johan	male	39.0	1	5	347082	31.2750	NaN	S
14	15	0	3	Vestrom, Miss. Hulda Amanda Adolfina	female	14.0	0	0	350406	7.8542	NaN	S
15	16	1	2	Hewlett, Mrs. (Mary D Kingcome)	female	55.0	0	0	248706	16.0000	NaN	S
16	17	0	3	Rice, Master. Eugene	male	2.0	4	1	382652	29.1250	NaN	Q
17	18	1	2	Williams, Mr. Charles Eugene	male	29.0	0	0	244373	13.0000	NaN	S
18	19 20	0	3	Vander Planke, Mrs. Julius (Emelia Maria Vande	female	31.0 25.0	1	0	345763	18.0000	NaN	s C
19				Masselmani, Mrs. Fatima	female			0	2649 239865	7.2250	NaN	
20	21	0	2	Fynney, Mr. Joseph J	male male	35.0	0	0	239865 248698	26.0000	NaN D56	s s
21	22	1	3	Beesley, Mr. Lawrence McGowan, Miss. Anna "Annie"	female	15.0	0	0	248698 330923	8.0292	NaN	0
23	23	1	1	Sloper, Mr. William Thompson	male	28.0	0	0	113788	35.5000	A6	s
23	25	0	3	Palsson, Miss. Torborg Danira	female	8.0	3	1	349909	21.0750	NaN	s
25	26	1	3	Asplund, Mrs. Carl Oscar (Selma Augusta Emilia	female	38.0	1	5	347077	31.3875	NaN	s
26	27	0	3	Emir, Mr. Farred Chehab	male	25.0	0	0	2631	7.2250	NaN	c
27	28	0	1	Fortune, Mr. Charles Alexander	male	19.0	3	2	19950	263.0000	C23 C25 C27	s
28	29	1	3	O'Dwyer, Miss. Ellen "Nellie"	female	25.0	0	0	330959	7.8792	NaN	0
29	30	0	3	Todoroff, Mr. Lalio	male	25.0	0	0	349216	7.8958	NaN	s
									***			
861	862	0	2	Giles, Mr. Frederick Edward	male	21.0	1	0	28134	11.5000	NaN	s
862	863	1	1	Swift, Mrs. Frederick Joel (Margaret Welles Ba	female	48.0	0	0	17466	25.9292	D17	s
863	864	0	3	Sage, Miss. Dorothy Edith "Dolly"	female	25.0	8	2	CA. 2343	69.5500	NaN	s
864	865	0	2	Gill, Mr. John William	male	24.0	0	0	233866	13.0000	NaN	s
865	866	1	2	Bystrom, Mrs. (Karolina)	female	42.0	0	0	236852	13.0000	NaN	S
866	867	1	2	Duran y More, Miss. Asuncion	female	27.0	1	0	SC/PARIS 2149	13.8583	NaN	С
867	868	0	1	Roebling, Mr. Washington Augustus II	male	31.0	0	0	PC 17590	50.4958	A24	S
868	869	0	3	van Melkebeke, Mr. Philemon	male	25.0	0	0	345777	9.5000	NaN	S
869	870	1	3	Johnson, Master. Harold Theodor	male	4.0	1	1	347742	11.1333	NaN	S
870	871	0	3	Balkic, Mr. Cerin	male	26.0	0	0	349248	7.8958	NaN	S
871	872	1	1	Beckwith, Mrs. Richard Leonard (Sallie Monypeny)	female	47.0	1	1	11751	52.5542	D35	S
872	873	0	1	Carlsson, Mr. Frans Olof	male	33.0	0	0	695	5.0000	B51 B53 B55	S
873	874	0	3	Vander Cruyssen, Mr. Victor	male	47.0	0	0	345765	9.0000	NaN	s
874	875	1	2	Abelson, Mrs. Samuel (Hannah Wizosky)	female	28.0	1	0	P/PP 3381	24.0000	NaN	С
875 876	876 877	1	3	Najib, Miss. Adele Kiamie "Jane" Gustafsson, Mr. Alfred Ossian	female male	15.0 20.0	0	0	2667 7534	7.2250 9.8458	NaN NaN	c s
876 877	877	0	3	Gustatsson, Mr. Alfred Ossian Petroff, Mr. Nedelio	male	19.0	0	0	7534 349212	9.8458 7.8958	NaN NaN	s s
877	878	0	3	Laleff, Mr. Kristo	male	25.0	0	0	349212	7.8958	NaN NaN	s
879	880	1	1	Potter, Mrs. Thomas Jr (Lily Alexenia Wilson)	female	56.0	0	1	11767	83 1583	C50	c
880	881	1	2	Shelley, Mrs. William (Imanita Parrish Hall)	female	25.0	0	1	230433	26.0000	NaN	s
881	882	0	3	Markun, Mr. Johann	male	33.0	0	0	349257	7.8958	NaN	s
882	883	0	3	Dahlberg, Miss. Gerda Ulrika	female	22.0	0	0	7552	10.5167	NaN	s
883	884	0	2	Banfield, Mr. Frederick James	male	28.0	0	0	C.A./SOTON 34068	10.5000	NaN	s
884	885	0	3	Sutehall, Mr. Henry Jr	male	25.0	0	0	SOTON/OQ 392076	7.0500	NaN	s
885	886	0	3	Rice, Mrs. William (Margaret Norton)	female	39.0	0	5	382652	29.1250	NaN	Q
886	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	211536	13.0000	NaN	s
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.0000	B42	s
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	25.0	1	2	W./C. 6607	23.4500	NaN	S
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369	30.0000	C148	С
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376	7.7500	NaN	Q

891 rows × 12 columns

In [474]: #Cleaning the dataset
 trainset.drop("Cabin",inplace=True,axis=1)#Removing all values in cabin column
 trainset.dropan()#Removing rows where all the values are null
 trainset.head(n=891)

:	Passengerld	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th	female	38.0	1	0	PC 17599	71.2833	С
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	S
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	S
5	6	0	3	Moran, Mr. James	male	25.0	0	0	330877	8.4583	Q
6	7	0	1	McCarthy, Mr. Timothy J	male	54.0	0	0	17463	51.8625	S
7	8	0	3	Palsson, Master. Gosta Leonard	male	2.0	3	1 2	349909	21.0750	s
9	10	1	2	Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg)  Nasser, Mrs. Nicholas (Adele Achem)	female female	27.0 14.0	0	0	347742 237736	11.1333 30.0708	s c
10	10	1	3	Sandstrom, Miss. Marguerite Rut	female	4.0	1	1	237736 PP 9549	16.7000	s
11	12	1	1	Bonnell, Miss. Elizabeth	female	58.0	0	0	113783	26.5500	s
12	13	0	3	Saundercock, Mr. William Henry	male	20.0	0	0	A/5. 2151	8.0500	s
13	14	0	3	Andersson, Mr. Anders Johan	male	39.0	1	5	347082	31.2750	s
14	15	0	3	Vestrom, Miss. Hulda Amanda Adolfina	female	14.0	0	0	350406	7.8542	s
15	16	1	2	Hewlett, Mrs. (Mary D Kingcome)	female	55.0	0	0	248706	16.0000	S
16	17	0	3	Rice, Master. Eugene	male	2.0	4	1	382652	29.1250	Q
17	18	1	2	Williams, Mr. Charles Eugene	male	29.0	0	0	244373	13.0000	S
18	19	0	3	Vander Planke, Mrs. Julius (Emelia Maria Vande	female	31.0	1	0	345763	18.0000	S
19	20	1	3	Masselmani, Mrs. Fatima	female	25.0	0	0	2649	7.2250	C
20	21	0	2	Fynney, Mr. Joseph J	male	35.0	0	0	239865	26.0000	S
21	22	1	2	Beesley, Mr. Lawrence	male	34.0	0	0	248698	13.0000	S
22	23	1	3	McGowan, Miss. Anna "Annie"	female	15.0	0	0	330923	8.0292	Q
23	24	1	1	Sloper, Mr. William Thompson	male	28.0	0	0	113788	35.5000	S
24 25	25 26	0	3	Palsson, Miss. Torborg Danira	female female	8.0	3	1	349909 347077	21.0750	s s
25	26	0	3	Asplund, Mrs. Carl Oscar (Selma Augusta Emilia  Emir. Mr. Farred Chehab	male	25.0	0	0	2631	7.2250	c
27	28	0	1	Fortune, Mr. Charles Alexander	male	19.0	3	2	19950	263.0000	s
28	29	1	3	O'Dwyer, Miss, Ellen "Nellie"	female	25.0	0	0	330959	7.8792	Q
29	30	0	3	Todoroff, Mr. Lalio	male	25.0	0	0	349216	7.8958	s
				-							
861	862	0	2	Giles, Mr. Frederick Edward	male	21.0	1	0	28134	11.5000	S
862	863	1	1	Swift, Mrs. Frederick Joel (Margaret Welles Ba	female	48.0	0	0	17466	25.9292	s
863	864	0	3	Sage, Miss. Dorothy Edith "Dolly"	female	25.0	8	2	CA. 2343	69.5500	S
864	865	0	2	Gill, Mr. John William	male	24.0	0	0	233866	13.0000	S
865	866	1	2	Bystrom, Mrs. (Karolina)	female	42.0	0	0	236852	13.0000	S
866	867	1	2	Duran y More, Miss. Asuncion	female	27.0	1	0	SC/PARIS 2149	13.8583	С
867	868	0	1	Roebling, Mr. Washington Augustus II	male	31.0	0	0	PC 17590	50.4958	S
868	869	0	3	van Melkebeke, Mr. Philemon	male	25.0	0	0	345777	9.5000	S
869	870	1	3	Johnson, Master. Harold Theodor	male	4.0	1	1	347742	11.1333	s
870 871	871 872	0	3	Balkic, Mr. Cerin Beckwith, Mrs. Richard Leonard (Sallie Monypeny)	male female	26.0 47.0	0	0	349248 11751	7.8958 52.5542	s s
872	873	0	1	Carlsson, Mr. Frans Olof	male	33.0	0	0	695	5.0000	s
873	874	0	3	Vander Cruyssen, Mr. Victor	male	47.0	0	0	345765	9.0000	s
874	875	1	2	Abelson, Mrs. Samuel (Hannah Wizosky)	female	28.0	1	0	P/PP 3381	24.0000	c
875	876	1	3	Najib, Miss. Adele Kiamie "Jane"	female	15.0	0	0	2667	7.2250	c
876	877	0	3	Gustafsson, Mr. Alfred Ossian	male	20.0	0	0	7534	9.8458	s
877	878	0	3	Petroff, Mr. Nedelio	male	19.0	0	0	349212	7.8958	S
878	879	0	3	Laleff, Mr. Kristo	male	25.0	0	0	349217	7.8958	s
879	880	1	1	Potter, Mrs. Thomas Jr (Lily Alexenia Wilson)	female	56.0	0	1	11767	83.1583	C
880	881	1	2	Shelley, Mrs. William (Imanita Parrish Hall)	female	25.0	0	1	230433	26.0000	S
881	882	0	3	Markun, Mr. Johann	male	33.0	0	0	349257	7.8958	S
882	883	0	3	Dahlberg, Miss. Gerda Ulrika	female	22.0	0	0	7552	10.5167	s
883	884	0	2	Banfield, Mr. Frederick James	male	28.0	0	0	C.A./SOTON 34068	10.5000	s
884 885	885 886	0	3	Sutehall, Mr. Henry Jr	male	25.0	0	0	SOTON/OQ 392076 382652	7.0500 29.1250	s
885	886 887	0	3	Rice, Mrs. William (Margaret Norton)  Montvila, Rev. Juozas	female male	39.0 27.0	0	5	382652 211536	29.1250	Q S
885	888	1	1	Graham, Miss, Margaret Edith	female	19.0	0	0	211536 112053	30,0000	s
888	889	0	3	Johnston, Miss, Catherine Helen "Carrie"	female	25.0	1	2	W./C. 6607	23.4500	s
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369	30.0000	c
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376	7.7500	Q
				ş,							-

891 rows × 11 columns

In [475]: #Converting the categorical data into numerical data
Gender = pd.get\_dummies(trainset["Sex"])
Embarked = pd.get\_dummies(trainset["Fibbarked"], drop\_first=True)
Class\_travelled = pd.get\_dummies(trainset["Pclass"], drop\_first=True)

In [476]: trainset

Out[476]:

		Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Embark
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th	female	38.0	1	0	PC 17599	71.2833	
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	
5	6	0	3	Moran, Mr. James	male	25.0	0	0	330877	8.4583	
5	7	0	1	McCarthy, Mr. Timothy J	male	54.0	0	0	17463	51.8625	
7	8	0	3	Palsson, Master. Gosta Leonard	male	2.0	3	1	349909	21.0750	
3	9	1	3	Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg)	female	27.0	0	2	347742	11.1333	
9	10	1	2	Nasser, Mrs. Nicholas (Adele Achem)	female	14.0	1	0	237736	30.0708	
)	11	1	3	Sandstrom, Miss. Marguerite Rut	female	4.0	1	1	PP 9549	16.7000	
1	12	1	1	Bonnell, Miss. Elizabeth	female	58.0	0	0	113783	26.5500	
2	13	0	3	Saundercock, Mr. William Henry	male	20.0	0	0	A/5. 2151	8.0500	
3	14	0	3	Andersson, Mr. Anders Johan	male	39.0	1	5	347082	31.2750	
4	15	0	3	Vestrom, Miss. Hulda Amanda Adolfina	female	14.0	0	0	350406	7.8542	
5	16	1	2	Hewlett, Mrs. (Mary D Kingcome)	female	55.0	0	0	248706	16.0000	
6	17	0	3	Rice, Master. Eugene	male	2.0	4	1	382652	29.1250	
7	18	1	2	Williams, Mr. Charles Eugene	male	29.0	0	0	244373	13.0000	
3	19	0	3	Vander Planke, Mrs. Julius (Emelia Maria Vande	female	31.0	1	0	345763	18.0000	
9	20	1	3	Masselmani, Mrs. Fatima	female	25.0	0	0	2649	7.2250	
0	21	0	2	Fynney, Mr. Joseph J	male	35.0	0	0	239865	26.0000	
L	22	1	2	Beesley, Mr. Lawrence	male	34.0	0	0	248698	13.0000	
2	23	1	3	McGowan, Miss. Anna "Annie"	female	15.0	0	0	330923	8.0292	
3	24	1	1	Sloper, Mr. William Thompson	male	28.0	0	0	113788	35.5000	
1	25	0	3	Palsson, Miss. Torborg Danira	female	8.0	3	1	349909	21.0750	
5	26	1	3	Asplund, Mrs. Carl Oscar (Selma Augusta Emilia	female	38.0	1	5	347077	31.3875	
5	27	0	3	Emir, Mr. Farred Chehab	male	25.0	0	0	2631	7.2250	
7	28	0	1	Fortune, Mr. Charles Alexander	male	19.0	3	2	19950	263.0000	
3	29	1	3	O'Dwyer, Miss. Ellen "Nellie"	female	25.0	0	0	330959	7.8792	
9	30	0	3	Todoroff, Mr. Lalio	male	25.0	0	0	349216	7.8958	
								***			
1	862	0	2	Giles, Mr. Frederick Edward	male	21.0	1	0	28134	11.5000	
2	863	1	1	Swift, Mrs. Frederick Joel (Margaret Welles Ba	female	48.0	0	0	17466	25.9292	
3	864	0	3	Sage, Miss. Dorothy Edith "Dolly"	female	25.0	8	2	CA. 2343	69.5500	
4	865	0	2	Gill, Mr. John William	male	24.0	0	0	233866	13.0000	
5	866	1	2	Bystrom, Mrs. (Karolina)	female	42.0	0	0	236852	13.0000	
6	867	1	2	Duran y More, Miss. Asuncion	female	27.0	1	0	SC/PARIS 2149	13.8583	
7	868	0	1	Roebling, Mr. Washington Augustus II	male	31.0	0	0	PC 17590	50.4958	
В	869	0	3	van Melkebeke, Mr. Philemon	male	25.0	0	0	345777	9.5000	
9	870	1	3	Johnson, Master. Harold Theodor	male	4.0	1	1	347742	11.1333	
0	871	0	3	Balkic, Mr. Cerin	male	26.0	0	0	349248	7.8958	
1	872	1	1	Beckwith, Mrs. Richard Leonard (Sallie Monypeny)	female	47.0	1	1	11751	52.5542	
2	873	0	1	Carlsson, Mr. Frans Olof	male	33.0	0	0	695	5.0000	
3	874	0	3	Vander Cruyssen, Mr. Victor	male	47.0	0	0	345765	9.0000	
4	875	1	2	Abelson, Mrs. Samuel (Hannah Wizosky)	female	28.0	1	0	P/PP 3381	24.0000	
5	876	1	3	Najib, Miss. Adele Kiamie "Jane"	female	15.0	0	0	2667	7.2250	
6	877	0	3	Gustafsson, Mr. Alfred Ossian	male	20.0	0	0	7534	9.8458	
7	878	0	3	Petroff, Mr. Nedelio	male	19.0	0	0	349212	7.8958	
В	879	0	3	Laleff, Mr. Kristo	male	25.0	0	0	349217	7.8958	
9	880	1	1	Potter, Mrs. Thomas Jr (Lily Alexenia Wilson)	female	56.0	0	1	11767	83.1583	
L	881	1	2	Shelley, Mrs. William (Imanita Parrish Hall)	female	25.0	0	1	230433	26.0000	
	882	0	3	Markun, Mr. Johann	male	33.0	0	0	349257	7.8958	
2	883	0	3	Dahlberg, Miss. Gerda Ulrika	female	22.0	0	0	7552	10.5167	
3	884	0	2	Banfield, Mr. Frederick James	male	28.0	0	0	C.A./SOTON 34068	10.5000	
1	885	0	3	Sutehall, Mr. Henry Jr	male	25.0	0	0	SOTON/OQ 392076	7.0500	
5	886	0	3	Rice, Mrs. William (Margaret Norton)	female	39.0	0	5	382652	29.1250	
6	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	211536	13.0000	
7	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.0000	
8	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	25.0	1	2	W./C. 6607	23.4500	
9	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369	30.0000	

891 rows × 11 columns

In [477]: #We add the numerical data i.e concat it to the existing dataframe
trainset = pd.concat([trainset,Class\_travelled,Gender,Embarked],axis=1)

In [478]: trainset

Out[478]:

	Passengerld	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Embarked	2	3	female	male	Q	s
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	S	0	1	0	1	0	1
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th	female	38.0	1	0	PC 17599	71.2833	С	0	0	1	0	0	0
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	S	0	1	1	0	0	1
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	S	0	0	1	0	0	1
4 5	5	0	3	Allen, Mr. William Henry Moran, Mr. James	male male	35.0 25.0	0	0	373450 330877	8.0500 8.4583	s o	0	1	0	1	0	1
6	7	0	1	McCarthy, Mr. Timothy J	male	54.0	0	0	17463	51.8625	s	0	0	0	1	0	1
7	8	0	3	Palsson, Master. Gosta Leonard	male	2.0	3	1	349909	21.0750	s	0	1	0	1	0	1
8	9	1	3	Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg)	female	27.0	0	2	347742	11.1333	s	0	1	1	0	0	1
9	10	1	2	Nasser, Mrs. Nicholas (Adele Achem)	female	14.0	1	0	237736	30.0708	С	1	0	1	0	0	0
10	11	1	3	Sandstrom, Miss. Marguerite Rut	female	4.0	1	1	PP 9549	16.7000	S	0	1	1	0	0	1
11	12	1	1	Bonnell, Miss. Elizabeth	female	58.0	0	0	113783	26.5500	S	0	0	1	0	0	1
12	13	0	3	Saundercock, Mr. William Henry	male	20.0	0	0	A/5. 2151	8.0500	s	0	1	0	1	0	1
13 14	14 15	0	3	Andersson, Mr. Anders Johan Vestrom, Miss. Hulda Amanda Adolfina	male female	39.0	1 0	5	347082 350406	31.2750 7.8542	s s	0	1	0	1	0	1
15	16	1	2	Hewlett, Mrs. (Mary D Kingcome)	female	55.0	0	0	248706	16.0000	s	1	0	1	0	0	1
16	17	0	3	Rice, Master. Eugene	male	2.0	4	1	382652	29.1250	0	0	1	0	1	1	0
17	18	1	2	Williams, Mr. Charles Eugene	male	29.0	0	0	244373	13.0000	s	1	0	0	1	0	1
18	19	0	3	Vander Planke, Mrs. Julius (Emelia Maria Vande	female	31.0	1	0	345763	18.0000	s	0	1	1	0	0	1
19	20	1	3	Masselmani, Mrs. Fatima	female	25.0	0	0	2649	7.2250	С	0	1	1	0	0	0
20	21	0	2	Fynney, Mr. Joseph J	male	35.0	0	0	239865	26.0000	s	1	0	0	1	0	1
21	22	1	2	Beesley, Mr. Lawrence	male	34.0	0	0	248698	13.0000	S	1	0	0	1	0	1
22	23	1	3	McGowan, Miss. Anna "Annie"	female	15.0	0	0	330923	8.0292	Q	0	1	1	0	1	0
23	24 25	1	1	Sloper, Mr. William Thompson Palsson, Miss. Torborg Danira	male female	28.0	0	0	113788 349909	35.5000 21.0750	s s	0	0	0	1	0	1
25	25	1	3	Asplund, Mrs. Carl Oscar (Selma Augusta Emilia	female	38.0	1	5	347077	31.3875	s	0	1	1	0	0	1
26	27	0	3	Emir, Mr. Farred Chehab	male	25.0	0	0	2631	7.2250	С	0	1	0	1	0	0
27	28	0	1	Fortune, Mr. Charles Alexander	male	19.0	3	2	19950	263.0000	s	0	0	0	1	0	1
28	29	1	3	O'Dwyer, Miss. Ellen "Nellie"	female	25.0	0	0	330959	7.8792	Q	0	1	1	0	1	0
29	30	0	3	Todoroff, Mr. Lalio	male	25.0	0	0	349216	7.8958	S	0	1	0	1	0	1
861	862	0	2	Giles, Mr. Frederick Edward	male	21.0	1	0	28134	11.5000	S	1	0	0	1	0	1
862	863 864	1	1 3	Swift, Mrs. Frederick Joel (Margaret Welles Ba Sage, Miss. Dorothy Edith "Dolly"	female	48.0 25.0	0	0	17466 CA, 2343	25.9292	s s	0	0	1	0	0	1
863 864	865	0	2	Sage, MISS. Dorothy Edith "Dolly"  Gill, Mr. John William	female male	24.0	0	0	233866	69.5500 13.0000	S	1	0	1	1	0	1
865	866	1	2	Bystrom, Mrs. (Karolina)	female	42.0	0	0	236852	13.0000	s	1	0	1	0	0	1
866	867	1	2	Duran y More, Miss. Asuncion	female	27.0	1	0	SC/PARIS 2149	13.8583	С	1	0	1	0	0	0
867	868	0	1	Roebling, Mr. Washington Augustus II	male	31.0	0	0	PC 17590	50.4958	s	0	0	0	1	0	1
868	869	0	3	van Melkebeke, Mr. Philemon	male	25.0	0	0	345777	9.5000	s	0	1	0	1	0	1
869	870	1	3	Johnson, Master. Harold Theodor	male	4.0	1	1	347742	11.1333	S	0	1	0	1	0	1
870	871	0	3	Balkic, Mr. Cerin	male	26.0	0	0	349248	7.8958	s	0	1	0	1	0	1
871 872	872 873	1	1	Beckwith, Mrs. Richard Leonard (Sallie Monypeny)  Carlsson, Mr. Frans Olof	female male	47.0 33.0	1	1 0	11751 695	52.5542 5.0000	s s	0	0	1	0	0	1
872	873 874	0	3	Vander Cruyssen, Mr. Victor	male	47.0	0	0	345765	9.0000	S	0	1	0	1	0	1
874	875	1	2	Abelson, Mrs. Samuel (Hannah Wizosky)	female	28.0	1	0	P/PP 3381	24.0000	c	1	0	1	0	0	0
875	876	1	3	Najib, Miss. Adele Kiamie "Jane"	female	15.0	0	0	2667	7.2250	С	0	1	1	0	0	0
876	877	0	3	Gustafsson, Mr. Alfred Ossian	male	20.0	0	0	7534	9.8458	s	0	1	0	1	0	1
877	878	0	3	Petroff, Mr. Nedelio	male	19.0	0	0	349212	7.8958	s	0	1	0	1	0	1
878	879	0	3	Laleff, Mr. Kristo	male	25.0	0	0	349217	7.8958	s	0	1	0	1	0	1
879	880	1	1	Potter, Mrs. Thomas Jr (Lily Alexenia Wilson)	female	56.0	0	1	11767	83.1583	С	0	0	1	0	0	0
880 881	881 882	1	2	Shelley, Mrs. William (Imanita Parrish Hall)	female male	25.0 33.0	0	1	230433 349257	26.0000 7.8958	S S	1	0	1	0	0	1
881 882	882 883	0	3	Markun, Mr. Johann Dahlberg, Miss. Gerda Ulrika		22.0	0	0	349257 7552	7.8958	s s	0	1	1	0	0	1
883	883	0	2	Banfield, Mr. Frederick James	male	28.0	0	0	C.A./SOTON 34068	10.5167	S	1	0	0	1	0	1
884	885	0	3	Sutehall, Mr. Henry Jr	male	25.0	0	0	SOTON/OQ 392076	7.0500	s	0	1	0	1	0	1
885	886	0	3	Rice, Mrs. William (Margaret Norton)	female	39.0	0	5	382652	29.1250	Q	0	1	1	0	1	0
886	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	211536	13.0000	s	1	0	0	1	0	1
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.0000	S	0	0	1	0	0	1
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	25.0	1	2	W./C. 6607	23.4500	S	0	1	1	0	0	1
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369	30.0000	С	0	0	0	1	0	0
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376	7.7500	Q	0	1	0	1	1	0

891 rows × 17 columns

In [479]: #We drop/Remove the columns from the dataframe that we don't need trainset.drop(["PassengerId","Pclass","Name","Sex","Ticket","Embarked","female"],axis=1,inplace=True)

```
In [480]: trainset
Out[480]:
              Survived Age SibSp Parch
                                      Fare 2 3 male Q S
                  0 22.0 1 0 7.2500 0 1
1 38.0 1 0 71.2833 0 0
                                0 7.2500 0 1 1 0 1
                          0 0 7.9250 0 1 0 0 1
                   1 26.0
                   1 35.0
                           1 0 53.1000 0 0 0 0 1
                   0 35.0
                          0 0 8.0500 0 1 1 0 1
                           0 0 8.4583 0 1 1 1 0
                   0 25.0
                           0 0 51.8625 0 0 1 0 1
                   0 2.0
                                1 21.0750 0 1 1 0 1
                   1 27.0
                                2 11.1333 0 1 0 0 1
                                0 30.0708 1 0 0 0 0
                   1 14.0
                   1 4.0
                                1 16.7000 0 1 0 0 1
                   1 58.0
                                0 26.5500 0 0 0 0 1
           12
                   0 20.0
                                0 8.0500 0 1 1 0 1
           13
                   0 39.0
                                5 31.2750 0 1 1 0 1
                                0 7.8542 0 1 0 0 1
           14
                   0 14.0
                   0 2.0
                                 1 29.1250 0 1 1 1 0
           17
                   1 29.0
                                0 13.0000 1 0 1 0 1
           18
                   0 31.0
                                 0 18.0000 0 1 0 0 1
                   1 25.0
                                0 7.2250 0 1 0 0 0
                   0 35.0
           21
                   1 34.0
                                0 13.0000 1 0 1 0 1
           22
                   1 15.0
                                0 8.0292 0 1 0 1 0
                                0 35.5000 0 0 1 0 1
           23
                   1 28.0
                   0 8.0
                                 1 21.0750 0 1 0 0 1
           25
                   1 38.0
                                5 31.3875 0 1 0 0 1
           26
                   0 25.0
                                0 7.2250 0 1 1 0 0
           27
                   0 19.0
                                2 263.0000 0 0 1 0 1
           28
                   1 25.0
                                0 7.8792 0 1 0 1 0
           861
                   0 21.0
                                 0 11.5000 1 0 1 0 1
           862
                                 0 25.9292 0 0 0 0 1
                   1 48.0
           863
                   0 25.0
                                 2 69.5500 0 1 0 0 1
                   0 24.0
                                 0 13.0000 1 0 1 0 1
           865
                   1 42.0
                                0 13.0000 1 0 0 0 1
           866
                   1 27.0
                                 0 13.8583 1 0 0 0 0
                                0 50.4958 0 0 1 0 1
                   0 31.0
                   0 25.0
                                0 9.5000 0 1 1 0 1
                   1 4.0
                                 1 11.1333 0 1 1 0 1
                                0 7.8958 0 1 1 0 1
           870
                  0 26.0
           871
                   1 47.0
                                1 52.5542 0 0 0 0 1
                   0 33.0
                                0 5.0000 0 0 1 0 1
                   0 47.0
           874
                   1 28.0
                                0 24.0000 1 0 0 0 0
           875
                   1 15.0
                                0 7.2250 0 1 0 0 0
                                0 9.8458 0 1 1 0 1
           876
                   0 20.0
                   0 19.0
           878
                   0 25.0
                                0 7.8958 0 1 1 0 1
           879
                   1 56.0
                                1 83.1583 0 0 0 0 0
                                1 26.0000 1 0 0 0 1
           880
                   1 25.0
                   0 33.0
                                0 7.8958 0 1 1 0 1
                   0 22.0
                                0 10.5167 0 1 0 0 1
           883
                  0 28.0
                                0 10.5000 1 0 1 0 1
           884
                  0 25.0
                                0 7.0500 0 1 1 0 1
           885
                  0 39.0
                                5 29.1250 0 1 0 1 0
           887
                   1 19.0
                                0 30.0000 0 0 0 0 1
           888
                  0 25.0 1 2 23.4500 0 1 0 0 1
                                0 30.0000 0 0 1 0 0
           889
                  1 26.0
                  0 32.0
                           0 0 7.7500 0 1 1 1 0
          891 rows × 10 columns
In [481]: #Declaring our y variables in the training set
y_train = trainset['Survived']
          #Declaring our x variables in the training set
x_train = trainset.drop(['Survived'], axis=1)
In [516]: #Converting the variables dataset x and y to NumPy Arrays
X = np.array(x_train)
Y = np.array(y_train)
z = np.array(***)
z=Y
               _dead_actual = 1.0 - ((float(np.count_nonzero(z)) / float(len(z))))
           #Function to define sigmoid Function
def sigmoid(z):
   return 1.0 / (1 + np.exp(-z))
          #Function to define cost Function
def cost_function(x, y, theta):
    m = float(len(y))
    h = sigmoid(np.dot(x, theta))
    cost = (1 / m)* (np.dot(-y.T, np.log(h)) - np.dot((1 - y).T, np.log(1 - h)))
    return cost.sum()
In [484]:
```

Skipping line 419: expected 11 fields, saw 21

```
for i in range(iteration):
    h = sigmoid(np.dot(x, theta))
    diff = h y
    J = np.dot(x.T, diff)
    theta = theta - J * (alpha / m)
    return theta
In [486]: iterations=1500 # No of iterations
alpha=0.01 #Learning rate
theta = gradient_descent(x_train, y_train,iterations,alpha)
print(theta)
                In [487]: ideal_parameter = cost_function(X,Y,theta)#Using
print(ideal_parameter)
                 0.635706655106
In [488]: #Function to predict if a person is dead or alive
def predict(x, theta):
    return sigmoid(np.dot(x, theta))
In [527]: yhat = predict(X, theta)
status_quo = abs(yhat - Y)
                for j in range(len(status_quo)):
    if status_quo[j] >= 0.5:
        status_quo[j] = 1
    else:
        status_quo[j] = 0
    print(status_quo) # 0 :- Dead 1 :- Alive
                perc_dead_predicted = 1.0 - ((float(np.count_nonzero(status_quo)) / float(len(status_quo))))
error = perc_dead_predicted - perc_dead_actual
Accuracy = 100 - (error*180)
print("\nAnAccuracy: ")
print(Accuracy: ")
                0.
1.
1.
0.
0.
0.
0.
0.
0.
0.
                                                                              0.
0.
0.
1.
1.
1.
0.
                                                                                          0.
1.
1.
1.
                                                           0.
0.
1.
0.
                 Accuracy: 94.051627385
In [490]: testset = pd.read_csv('/home/lavahawk0123/Documents/Tasks-MRM/Tasks-ADMIN/Task 2 Logistic Regression/titanic_test.csv', sep= ",",error_bad_lines=False)
```

In [491]: testset

	ssengerld P		Name		_	SibSp		Ticket	Fare		Embarked	
0	892 893	3	Kelly, Mr. James Wilkes, Mrs. James (Ellen Needs)		34.5 47.0	0	0	330911 363272	7.8292 7.0000	NaN NaN	Q S	
2	894	2	Myles, Mr. Thomas Francis		62.0	0	0	240276	9.6875	NaN	Q	
3	895	3	Wirz, Mr. Albert		27.0	0	0	315154	8.6625	NaN	s	
4	896	3	Hirvonen, Mrs. Alexander (Helga E Lindqvist)		22.0	1	1	3101298	12.2875	NaN	s	
5	897	3	Svensson, Mr. Johan Cervin	male	14.0	0	0	7538	9.2250	NaN	s	
6	898	3	Connolly, Miss. Kate	female	30.0	0	0	330972	7.6292	NaN	Q	
7	899	2	Caldwell, Mr. Albert Francis	male	26.0	1	1	248738	29.0000	NaN	s	
8	900	3	Abrahim, Mrs. Joseph (Sophie Halaut Easu)	female	18.0	0	0	2657	7.2292	NaN	С	
9	901	3	Davies, Mr. John Samuel	male	21.0	2	0	A/4 48871	24.1500	NaN	S	
10	902	3	Ilieff, Mr. Ylio	male	NaN	0	0	349220	7.8958	NaN	S	
11	903	1	Jones, Mr. Charles Cresson	male	46.0	0	0	694	26.0000	NaN	S	
12	904	1	Snyder, Mrs. John Pillsbury (Nelle Stevenson)		23.0	1	0	21228	82.2667	B45	S	
13	905	2	Howard, Mr. Benjamin		63.0	1	0	24065	26.0000	NaN	S	
14	906		Chaffee, Mrs. Herbert Fuller (Carrie Constance		47.0	1	0	W.E.P. 5734	61.1750	E31	s	
15	907	2	del Carlo, Mrs. Sebastiano (Argenia Genovesi)		24.0	1	0	SC/PARIS 2167	27.7208	NaN	С	
16 17	908 909	2	Keane, Mr. Daniel Assaf, Mr. Gerios		35.0 21.0	0	0	233734 2692	12.3500 7.2250	NaN NaN	Q C	
18	910	3	Ilmakangas, Miss. Ida Livija		27.0	1	0	STON/02. 3101270	7.9250	NaN	s	
19	910	3	Assaf Khalil, Mrs. Mariana (Miriam")"		45.0	0	0	2696	7.9250	NaN NaN	c	
20	912	1	Rothschild, Mr. Martin		55.0	1	0	PC 17603	59.4000	NaN	С	
21	913	3	Olsen, Master. Artur Karl	male	9.0	0	1	C 17368	3.1708	NaN	s	
22	914	1	Flegenheim, Mrs. Alfred (Antoinette)		NaN	0	0	PC 17598	31.6833	NaN	s	
23	915	1	Williams, Mr. Richard Norris II		21.0	0	1	PC 17597	61.3792	NaN	С	
24	916		Ryerson, Mrs. Arthur Larned (Emily Maria Borie)		48.0	1	3		262.3750		С	
25	917	3	Robins, Mr. Alexander A	male	50.0	1	0	A/5. 3337	14.5000	NaN	S	
26	918	1	Ostby, Miss. Helene Ragnhild	female	22.0	0	1	113509	61.9792	B36	С	
27	919	3	Daher, Mr. Shedid	male	22.5	0	0	2698	7.2250	NaN	С	
28	920	1	Brady, Mr. John Bertram		41.0	0	0	113054	30.5000	A21	S	
29	921	3	Samaan, Mr. Elias	male	NaN	2	0	2662	21.6792	NaN	С	
						***						
805	1280	3	Canavan, Mr. Patrick		21.0	0	0	364858	7.7500	NaN	Q	
806 807	1281 1282	3	Palsson, Master. Paul Folke Payne, Mr. Vivian Ponsonby	male male	6.0 23.0	3	1	349909 12749	21.0750 93.5000	NaN B24	s s	
808	1283		Lines, Mrs. Ernest H (Elizabeth Lindsey James)		51.0	0	1	PC 17592	39.4000	D28	s	
809	1284	3	Abbott, Master. Eugene Joseph		13.0	0	2	C.A. 2673	20.2500	NaN	s	
810	1285	2	Gilbert, Mr. William		47.0	0	0	C.A. 30769	10.5000	NaN	s	
811	1286	3	Kink-Heilmann, Mr. Anton	male	29.0	3	1	315153	22.0250	NaN	s	
812	1287	1	Smith, Mrs. Lucien Philip (Mary Eloise Hughes)	female	18.0	1	0	13695	60.0000	C31	s	
813	1288	3	Colbert, Mr. Patrick	male	24.0	0	0	371109	7.2500	NaN	Q	
814	1289	1	Frolicher-Stehli, Mrs. Maxmillian (Margaretha	female	48.0	1	1	13567	79.2000	B41	С	
815	1290	3	Larsson-Rondberg, Mr. Edvard A		22.0	0	0	347065	7.7750	NaN	S	
816	1291	3	Conlon, Mr. Thomas Henry		31.0	0	0	21332	7.7333	NaN	Q	
817	1292	1	Bonnell, Miss. Caroline		30.0	0	0		164.8667	C7	s	
818 819	1293	2	Gale, Mr. Harry		38.0	1	0	28664 112378	21.0000 59.4000	NaN NaN	s	
819 820	1294 1295	1	Gibson, Miss. Dorothy Winifred Carrau, Mr. Jose Pedro		22.0 17.0	0	0	112378	59.4000 47.1000	NaN NaN	c s	
821	1295	1	Frauenthal, Mr. Isaac Gerald		43.0	1	0	17765	27.7208	D40	c	
822	1297	2	Nourney, Mr. Alfred (Baron von Drachstedt")"		20.0	0	0	SC/PARIS 2166	13.8625	D38	С	
823	1298	2	Ware, Mr. William Jeffery		23.0	1	0	28666	10.5000	NaN	s	
824	1299	1	Widener, Mr. George Dunton		50.0	1	1		211.5000	C80	c	
825	1300	3	Riordan, Miss. Johanna Hannah"		NaN	0	0	334915	7.7208	NaN	Q	
826	1301	3	Peacock, Miss. Treasteall	female	3.0	1	1	SOTON/O.Q. 3101315	13.7750	NaN	s	
827	1302	3	Naughton, Miss. Hannah	female	NaN	0	0	365237	7.7500	NaN	Q	
828	1303	1	Minahan, Mrs. William Edward (Lillian E Thorpe)	female	37.0	1	0	19928	90.0000	C78	Q	
829	1304	3	Henriksson, Miss. Jenny Lovisa	female	28.0	0	0	347086	7.7750	NaN	S	
830	1305	3	Spector, Mr. Woolf	male	NaN	0	0	A.5. 3236	8.0500	NaN	s	
831	1306	1	Oliva y Ocana, Dona. Fermina	female	39.0	0	0	PC 17758	108.9000	C105	С	
832	1307	3	Saether, Mr. Simon Sivertsen	male	38.5	0	0	SOTON/O.Q. 3101262	7.2500	NaN	S	
833	1308	3	Ware, Mr. Frederick			0	0	359309	8.0500	NaN	s	
834	1309	3	Peter, Master. Michael J	male	NaN	1	1	2668	22.3583	NaN	С	
#Functi def add Age Pcl if	_age(cols = cols[6 ass = col pd.isnull return	olace i): i] Ls[1] L(Age)	<pre>null ages with average value of : ::stset[testset["Pclass"] == Pclass"]</pre>		ge"]	.mean()	)					
els	return /		to replace null age values									

In [494]: #Cleaning the dataset
testset.drop("Cabin",inplace=True,axis=1)#Removing all values in cabin column
testset.dropn()#Removing rows where all the values are null
testset.head(n=891)

]:	P	assengerid	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Embarked
	0	892	3	Kelly, Mr. James	male	34.5	0	0	330911	7.8292	Q
	1	893	3	Wilkes, Mrs. James (Ellen Needs)		47.0	1	0	363272	7.0000	s
	2	894	2	Myles, Mr. Thomas Francis		62.0	0	0	240276	9.6875	Q
	3	895	3	Wirz, Mr. Albert	male	27.0	0	0	315154	8.6625	s
	4	896	3	Hirvonen, Mrs. Alexander (Helga E Lindqvist)	female	22.0	1	1	3101298	12.2875	S
	5	897	3	Svensson, Mr. Johan Cervin	male	14.0	0	0	7538	9.2250	S
	6	898	3	Connolly, Miss. Kate		30.0	0	0	330972	7.6292	Q
	7	899	2	Caldwell, Mr. Albert Francis		26.0	1	1	248738	29.0000	S
	8	900	3	Abrahim, Mrs. Joseph (Sophie Halaut Easu)		18.0	0	0	2657	7.2292	С
	9	901	3	Davies, Mr. John Samuel		21.0	2		A/4 48871	24.1500	s
	10	902	3	llieff, Mr. Ylio		24.0	0		349220	7.8958	s
	11 12	903 904	1	Jones, Mr. Charles Cresson Snyder, Mrs. John Pillsbury (Nelle Stevenson)	male female	46.0 23.0	0	0	694 21228	26.0000 82.2667	s s
	13	904	2	Snyder, Mrs. John Pilisbury (Nelle Stevenson)  Howard, Mr. Benjamin		63.0	1	0	21228	26.0000	s
	14	906		Chaffee, Mrs. Herbert Fuller (Carrie Constance		47.0	1		W.E.P. 5734	61.1750	S
	15	907	2			24.0	1	0	SC/PARIS 2167	27.7208	c
	16	908	2	Keane Mr Daniel		35.0	0	0	233734	12.3500	Q
	17	909	3	Assaf, Mr. Gerios		21.0	0		2692	7.2250	c
	18	910	3			27.0	1	0	STON/O2. 3101270	7.9250	s
	19	911	3	Assaf Khalil, Mrs. Mariana (Miriam'')"	female	45.0	0		2696	7.2250	c
	20	912	1	Rothschild, Mr. Martin	male	55.0	1		PC 17603	59.4000	С
	21	912	3	Olsen, Master, Artur Karl	male	9.0	0	1	C 17368	3.1708	s
	22	913	1			40.0	0	0	PC 17598	31.6833	S
	23	914	1	Williams, Mr. Richard Norris II		21.0	0	1	PC 17598 PC 17597	61.3792	c
	24	915	1		female	48.0	1			262.3750	С
	24 25	916	3	Robins, Mr. Alexander A		50.0	1		A/5. 3337	14.5000	s
	25 26	917 918	1	Robins, Mr. Alexander A Ostby, Miss. Helene Ragnhild		22.0	0		A/5. 3337 113509	14.5000 61.9792	s c
	26 27	918 919	3	Ostby, Miss. Helene Ragnhild  Daher, Mr. Shedid		22.0	0	0	113509 2698	7.2250	c
	27	919 920	1	Brady, Mr. John Bertram		41.0	0	0	2698 113054	7.2250	S
	28 29	920 921	3	Brady, Mr. John Bertram Samaan, Mr. Elias		24.0	2	0	113054 2662	21.6792	c c
									2002		
	805	1280		Canavan, Mr. Patrick	malo	21.0			364858	7.7500	
											Q
	806	1281	3	Palsson, Master. Paul Folke	male	6.0	3	1	349909	21.0750	s
	807	1282	1	Payne, Mr. Vivian Ponsonby	male	23.0	0		12749 BC 17502	93.5000	s s
	808	1283	1	Lines, Mrs. Ernest H (Elizabeth Lindsey James)  Abbott, Master. Eugene Joseph	female male	51.0	0		PC 17592	39.4000	
	809	1284	3				0		C.A. 2673	20.2500	s
	810	1285	2	Gilbert, Mr. William	male		0	0	C.A. 30769	10.5000	s
	811	1286	3	Kink-Heilmann, Mr. Anton		29.0	3	1	315153	22.0250	S
	812	1287	1	Smith, Mrs. Lucien Philip (Mary Eloise Hughes)		18.0	1		13695	60.0000	s
	813	1288	3	Colbert, Mr. Patrick		24.0	0		371109	7.2500	Q
	814	1289	1	Frolicher-Stehli, Mrs. Maxmillian (Margaretha	female	48.0	1	1	13567	79.2000	С
	815	1290	3	Larsson-Rondberg, Mr. Edvard A	male		0	0	347065	7.7750	s
	816	1291	3	Conlon, Mr. Thomas Henry		31.0	0	0	21332	7.7333	Q
	817	1292	1	Bonnell, Miss. Caroline	female	30.0	0			164.8667	s
	818	1293	2	Gale, Mr. Harry		38.0	1	0	28664	21.0000	s
	819	1294	1	Gibson, Miss. Dorothy Winifred		22.0	0		112378	59.4000	С
	820	1295	1	Carrau, Mr. Jose Pedro	male		0	0	113059	47.1000	s
	821	1296	1	Frauenthal, Mr. Isaac Gerald		43.0	1	0	17765	27.7208	С
	822	1297	2	Nourney, Mr. Alfred (Baron von Drachstedt")"		20.0	0		SC/PARIS 2166	13.8625	С
	823	1298	2	Ware, Mr. William Jeffery		23.0	1		28666	10.5000	s
	824	1299	1	Widener, Mr. George Dunton		50.0	1			211.5000	С
	825	1300	3	Riordan, Miss. Johanna Hannah***	female		0	0	334915	7.7208	Q
	826	1301	3		female	3.0	1		SOTON/O.Q. 3101315	13.7750	s
	827	1302	3	Naughton, Miss. Hannah		24.0	0		365237	7.7500	Q
	828	1303		Minahan, Mrs. William Edward (Lillian E Thorpe)			1	0	19928	90.0000	Q
	829	1304	3	Henriksson, Miss. Jenny Lovisa			0	0	347086	7.7750	S
	830	1305	3	Spector, Mr. Woolf	male		0		A.5. 3236	8.0500	S
	831	1306	1	Oliva y Ocana, Dona. Fermina			0	0	PC 17758		С
	832	1307	3	Saether, Mr. Simon Sivertsen		38.5	0		SOTON/O.Q. 3101262	7.2500	S
	833	1308	3	Ware, Mr. Frederick			0	0	359309	8.0500	S
	834	1309	3	Peter, Master. Michael J	male	24.0	1	1	2668	22.3583	С
	835 rov	vs × 10 colu	nns								
1:	sex =	pd.get_d ked = pd.	ummies get du	<pre>gorical data into numerical data (testset['Sex'], drop_first=True nmies(testset['Embarked'], drop_ ies(testset['Pclass'], drop_firs'</pre>	) first=	True	)				

In [495]:

embarkeu = pu.get\_oummies(testset[ brokes\*], drop\_lifst=True)
pclass = pd.get\_dummies(testset[ Pclass\*], drop\_first=True)
testset = pd.concat([testset, sex, embarked, pclass], axis=1)

In [496]: #We drop/Remove the columns from the dataframe that we don't need testset.drop(['PassengerId', 'Pclass', 'Name', 'Sex', 'Ticket', 'Embarked'], axis=1, inplace=True)

Logical Regression-Success In [497]: testset = testset.dropna() #Deletes all rows with all null values
 testset Out[497]: Fare male Q S 2 3 0 34.5 1 0 7.0000 0 0 1 0 1 **1** 47.0 **2** 62.0 0 0 9.6875 0 0 8.6625 1 1 0 1 0 3 27.0 1 0 1 0 1 4 22.0 1 1 12.2875 0 0 1 0 1 6 30.0 0 0 7.6292 7 26.0 1 1 29.0000 1 0 1 1 0 8 18.0 0 7.2292 9 21.0 2 0 24.1500 **10** 24.0 11 46.0 0 26.0000 **12** 23.0 0 82.2667 0 0 1 0 0 **13** 63.0 0 26.0000 **15** 24.0 0 27.7208 **16** 35.0 0 12.3500 **17** 21.0 0 7.2250 **20** 55.0 0 59.4000 21 9.0 1 3.1708 22 40.0 0 31.6833 **24** 48.0 3 262.3750 **25** 50.0 0 14.5000 **26** 22.0 1 61.9792 **27** 22.5 0 0 7.2250 **28** 41.0 0 30.5000 **29** 24.0 2 0 21.6792 0 7.7500 805 21.0 **807** 23.0 0 93.5000 808 51.0 1 39.4000 **809** 13.0 2 20.2500 **810** 47.0 0 10.5000 1 0 1 1 0 **812** 18.0 1 0 60.0000 813 24.0 0 7.2500 1 1 0 0 1 **814** 48.0 1 79.2000 0 7.7750 **815** 22.0 **816** 31.0 0 7.7333 **817** 30.0 0 164.8667 818 38.0 0 21.0000 **819** 22.0 1 59.4000 **821** 43.0 0 27.7208 822 20.0 0 13.8625 **823** 23.0 0 10.5000 **826** 3.0 1 13.7750 **827** 24.0 0 7.7500 0 1 0 0 1 **828** 37.0 0 90.0000 **830** 24.0 0 8.0500 **831** 39.0 0 108.9000 1 0 1 0 1 **832** 38.5 0 7.2500

833 rows × 9 columns In [498]:  $x_{test} = np.array(testset)$  #Converting the dataset to an array  $print(x_{test})$ 

[[ 34.5 0. [ 47. 1. [ 62. 0. 0. ..., 1. 0. ..., 1. 1. ..., 0.

**834** 24.0

```
In [503]: #Using theta value from earlier training data to predict value for test data
test_pred = predict(x_test, theta)
for t in range(len(test_pred)):
    if test_pred[t] >= 0.5:
        test_pred[t] = 1
    else:
                    test_pred[t] = 0
print(test_pred) # Prediction where \theta :- Dead 1 :- Alive
                                                              0.
0.
0.
1.
0.
1.
0.
0.
0.
0.
                                                                                                           In [ ]:
     In [ ]:
     In [ ]:
```