n [1]:	<pre>import import import import import %matplo import warning</pre> filepat df= pd.	warnings gs.filterwa  th2 = r"C:\ read_csv(f	s sns p.pyplot a s sn e urnings("i	as plt  .gnore")  523\OneDriv	# For 6	data visu plotting gnore any	ical calculat ualization graphs y warnings s\wine\winequ		v"			
	print(d 0 wh 1 wh 2 wh 3 wh 4 wh  6492 6493 6494 6495 6496	aff)  type fixed nite nite nite nite nite nite nite nite	d acidity 7.0 6.3 8.1 7.2 7.2 6.2 5.9 6.3 5.9 6.0	volatile  ur dioxide 45.0 14.0	0.270 0.300 0.280 0.230 0.230  0.600 0.550 0.510 0.645 0.310	0. 0. 0. 0. 0. 0. 0. 0. 17	.32  .08 .10 .13 .12 .47 xide density 70.0 1.00100 32.0 0.99400	20.7 1.6 6.9 8.5 8.5  2.0 2.2 2.3 2.0 3.6 PH \ 0 3.00 0 3.30				
	2 3 4  6492 6493 6494 6495 6496	0.050 0.058 0.058 0.058  0.090 0.062 0.076 0.075 0.067 ulphates a 0.45 0.49 0.44 0.40	alcohol c 8.8 9.5 10.1 9.9	30.0 47.0 47.0  32.0 39.0 29.0 32.0 18.0 quality 6 6 6		9 18 18 4 5 4	32.0 0.99400 97.0 0.99510 86.0 0.99560  44.0 0.99490 51.0 0.99512 40.0 0.99574 44.0 0.99549 42.0 0.99549	0 3.26 0 3.19 0 3.19 				
n [3]: ut[3]:	4  6492 6493 6494 6495 6496	0.40  0.58 NaN 0.75 0.71 0.66	9.9  10.5 11.2 11.0 10.2	6  5 6 6 5 6	residual sugar chlo	orides	free sulfur dioxide	total sulfur dioxide	density pH	sulphates a	alcohol qu	ıality
n [4]:	<ul><li>white</li><li>white</li><li>white</li><li>white</li><li>white</li><li>df= df.</li></ul>	7.0 6.3 8.1 7.2 7.2 dropna()	0.27 0.30 0.28 0.23 0.23	0.36 0.34 0.40 0.32 0.32	20.7 1.6 6.9 8.5 8.5	0.045 0.049 0.050 0.058 0.058	45.0 14.0 30.0 47.0 47.0	170.0 132.0 97.0 186.0 186.0	1.0010 3.00 0.9940 3.30 0.9951 3.26 0.9956 3.19 0.9956 3.19	0.49 0.44 0.40	8.8 9.5 10.1 9.9 9.9	6 6 6 6
ut[5]:	count 64 mean std min 25% 50%	7.217755 1.297913 3.800000 6.400000 7.000000	0.339589 0.164639 0.080000 0.230000 0.290000	0.318758 0.145252 0.000000 0.250000 0.310000	residual sugar 6463.000000 5.443958 4.756852 0.600000 1.800000 3.000000	0.05605 0.03507 0.00900 0.03800 0.04700	17.758815 17.000000 17.000000 29.000000	115.694492 56.526736 6.000000 77.000000	density  0 6463.000000  2 0.994698  6 0.003001  0 0.987110  0 0.992330  0 0.994890	0 6463.000000 3 3.218332 1 0.160650 2.720000 3.110000 3.210000	0 6463.000 2 0.531 0 0.148 0 0.220 0 0.430 0 0.510	9000 6 150 9913 9000 9000
n [6]:	unique for fea pri  type has  citric a 0.35 0. 0.13 0.	ture in un.nt("{} has s 2 unique acid has 89 0.2 0.28 0.46 0.	rique:	re values : ['white' 'values : [00.27 0.31 000.63 0.66 000]	{} {}".fo	0.4 0.32 0.33 0.15 0. 0.47		[feature].	1.038980 and len(df  unique()),	4.010000 [feature].u	2.000 unique())	0000
n [7]: n [8]: n [9]:	0.12 0. 0.52 1. 0.86 0. quality  from sk le=Labe  df1=df	.09 0.53 0. . 0.01 0. .11 0.91 0. has 7 unique slearn.prepelEncoder()	.02 0.65 0 .74 0.81 0 .76 0.75] que values	0.17 0.71 0	0.06 0.68 ( 0.73 0.99 ( 8 4 3 9]	0.72 0.69 0.78 0.79	9 1.66 0.57 0	0.05				
ut[9]:		[i]=le.fit	volatile acidity  0.27  0.30  0.28  0.23		20.7 1.6 6.9	0.045 0.049 0.050 0.058	free sulfur dioxide  45.0  14.0  30.0  47.0	total sulfur dioxide  170.0  132.0  97.0  186.0	density pH  1.0010 3.00  0.9940 3.30  0.9951 3.26  0.9956 3.19	0.49	8.8 9.5 10.1 9.9	6 6 6
[10]: t[10]:	4 1 sns.sca <axessub< td=""><td>7.2</td><td>0.23</td><td>0.32 0.32 'residual ual sugar'&gt;</td><td>8.5 sugar'])</td><td>0.058</td><td>47.0</td><td>186.0</td><td>0.9956 3.19 0.9956 3.19</td><td></td><td>9.9</td><td>6</td></axessub<>	7.2	0.23	0.32 0.32 'residual ual sugar'>	8.5 sugar'])	0.058	47.0	186.0	0.9956 3.19 0.9956 3.19		9.9	6
[11]: [12]:	20 - 10 - 0 df1 = d	df1.drop(df		4000 50 esidual sug		index)						
t[12]:	<axessub 30 - 25 - 20 - 10 - 5 -</axessub 	oplot:ylabe	el='residu	ual sugar'>								
[13]: t[13]:	sns.sca <axessub< td=""><td>atterplot(d</td><td></td><td>4000 50</td><td></td><td>e'])</td><td></td><td></td><td></td><td></td><td></td><td></td></axessub<>	atterplot(d		4000 50		e'])						
[14]:	tree sulfur dioxi	df1.drop(df		ree sulfur			lex)					
[15]: t[15]:				'free sulf								
[16]: t[16]:	20 - 0 sns.sca			['density']	000 6000							
[17]:	0.995 - 0.990 -	<b>0 1000</b> lf1.drop(df		000 4000 ensity']>1.	<b>5000 6000</b>							
[18]: t[18]:	1.0025 - 1.0000 - 0.9975 -		lata =df1[	['density']								
La	0.9925 - 0.9900 - 0.9875 -	0 1000										
[19]: [20]: t[20]:	y=df1[' y.shape (6459,)	quality']	2000 3	4000	5000 600	)0						
[20]:	y.shape	quality']	volatile acidity 0.27 0.30 0.28 0.23		residual sugar 20.7 1.6 6.9 8.5		free sulfur dioxide  45.0 14.0 30.0 47.0 47.0	total sulfur dioxide 170.0 132.0 97.0 186.0 186.0	density pH  1.0010 3.00  0.9940 3.30  0.9951 3.26  0.9956 3.19  0.9956 3.19	0.49 0.44 0.40	8.8 9.5 10.1 9.9 9.9	6 6 6 6
[20]: t[20]: [21]: t[21]: [22]: [23]:	y.shape (6459,)  dfl.hea  type  0	quality']  fixed acidity  7.0  6.3  8.1  7.2  7.2  7.2  "type", "fixed acidity  fixed acidity  7.0  6.3  8.1  7.2  7.2  7.2  "type", "fixed acidity  fixed acidity  7.0  6.3  8.1  7.2  7.2  7.2	volatile acidity  0.27  0.30  0.28  0.23  0.23  0.23  .xed acidity  0.27  0.30  0.28  0.23  0.23  0.23	citric racid 0.36 0.34 0.40 0.32 0.32 0.32 cty", "volat transform( 76547, -0. 931958], 691924, -0.	residual sugar  20.7  1.6  6.9  8.5  8.5  ile acidit andardScal	0.045 0.049 0.050 0.058 0.058 ty", "citr	dioxide  45.0  14.0  30.0  47.0  47.0  ric acid", "re	97.0 186.0 186.0	1.0010 3.00 0.9940 3.30 0.9951 3.26 0.9956 3.19 0.9956 3.19	0.45 0.49 0.44 0.40 0.40	8.8 9.5 10.1 9.9 9.9	6 6 6 6
[20]: [21]: [21]: [21]: [22]: [23]: [24]: [24]:	y.shape (6459,)  dfl.hea  type  0	quality']  fixed acidity  7.0  6.3  8.1  7.2  7.2  7.2  7.2  7.2  7.2  7.2  7	volatile acidity  0.27  0.30  0.28  0.23  0.23  0.23  0.23  0.23  0.26  0.27  0.30  0.28  0.23  0.23  0.23  0.23  0.23  0.23  0.23  0.23  0.23  0.23  0.23  0.23  0.23  0.23  0.23  0.23  0.23  0.23  0.23  0.23  0.23  0.23  0.24  0.32  0.32  0.32  0.32  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42	citric racid  0.36  0.34  0.40  0.32  0.32  cty", "volat  transform(  76547, -0. 931958], 691924, -0. 253343], 976101, -0. 957387], 691924, 1. 486546], 507041, 1. 574728], 803262, -0. 486546]])  con import	residual sugar  20.7  1.6  6.9  8.5  8.5  ile acidit andardScal  x)  .42256361, .24018217, .3617698, .8572045, .17938835,  train_test	0.045 0.049 0.050 0.058 0.058 ty","citr ler, -1, 0, 0, 1, 2, 1	dioxide  45.0  14.0  30.0  47.0  47.0  47.0  .35885052,  .50862326,  .25962675,  .25561277,  .18934965,	dioxide  170.0  132.0  97.0  186.0  186.0  esidual succession	1.0010 3.00 0.9940 3.30 0.9951 3.26 0.9956 3.19 0.9956 3.19 gar", "chlor	0.45 0.49 0.44 0.40 0.40	8.8 9.5 10.1 9.9 9.9	6 6 6 6
[20]: [21]: [21]: [21]: [22]: [23]: [24]: [24]: [27]: [27]: [28]: [29]:	y.shape (6459,)  dfl.hea  type  0	quality']  fixed acidity  7.0  6.3  8.1  7.2  7.2  7.2  7.2  7.2  7.2  7.2  7	volatile acidity  0.27  0.30  0.28  0.23  0.23  0.23  2xed acidity  2, -0.167  2, -1.419  72, -0.706  2, -1.419  72, -0.706  2, -0.832  72, -0.832  72, -0.832  72, -0.938  39, -0.245  39, -0.245  39, -0.938  62, -0.938  62, -0.938  62, -0.938  63, -0.938  62, -0.938  62, -0.938  63, -0.938  64, -0.938  65, -0.938  62, -0.938  62, -0.938  63, -0.938  64, -0.938  65, -0.938  65, -0.938  66, -0.938  67, -0.938  68, -0.938  69, -0.938  69, -0.938  60, -0.938  61_selecting  61_selecting  62, -0.938  63, -0.938  64, -0.938  65, -0.938  66, -0.938  67, -0.938  67, -0.938  67, -0.938  68, -0.938  69, -0.938  69, -0.938  69, -0.938  60, -0.938  60, -0.938  61_selecting  61_selecting  62_selecting  63_selecting  63_selecting  63_selecting  64_selecting  64_selecting  65_selecting  65_s	citric racid  0.36  0.34  0.40  0.32  0.32  cty", "volat  transform(  76547, -0. 931958], 691924, -0. 253343], 976101, -0. 957387], 691924, 1. 486546], 507041, 1. 574728], 803262, -0. 486546]])  con import	residual sugar  20.7  1.6  6.9  8.5  8.5  ile acidit andardScal x)  .42256361, .24018217, .3617698, .8572045, .17938835, train_test a_test_split chape,y_test	0.045 0.049 0.050 0.058 0.058  ty", "citr ler , -1, 0, 1, 2, 1.  t_split it(x,y, t	dioxide  45.0  14.0  30.0  47.0  47.0  ric acid","re  .35885052, .50862326, .25962675, .25561277, .18934965, .06886539,	dioxide  170.0  132.0  97.0  186.0  186.0  esidual succession	1.0010 3.00 0.9940 3.30 0.9951 3.26 0.9956 3.19 0.9956 3.19 gar", "chlor	0.45 0.49 0.44 0.40 0.40	8.8 9.5 10.1 9.9 9.9	6 6 6 6
[20]: t[20]: t[21]: t[21]: t[21]: t[21]: t[22]: [23]: t[24]: t[24]: t[24]: t[24]: t[27]: t[27]: t[28]: t[30]: t[30]: t[30]: t[30]:	y.shape (6459,)  dfl.hea  type  0	quality']  fixed acidity  7.0 6.3 8.1 7.2 7.2 7.2 7.2 7.2 8"type","fix clearn.prepadardScaler( 10.5721657 -0.5450119 10.5721657 -0.2763842 10.5721657 -0.6121688 1.469696 1.7477453 1.469696 1.7477453 1.469696 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.7477453 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682 1.2010682	volatile acidity  0.27  0.30  0.28  0.23  0.23  0.23  0.23  0.23  0.26  0.27  0.30  0.28  0.29  0.29  0.29  0.20  0.30  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.42  0.43  0.42  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43  0.43	citric racid  0.36  0.34  0.40  0.32  0.32  0.32  cty", "volat  fransform(  76547, -0. 231958], 691924, -0. 25343], 976101, -0. 257387], 691924, 1. 486546], 607041, 1. 774728], 803262, -0. 486546]])  con import  cest =train  cest, y_train.s  4521,), (19  import Log  cest, y_pred	residual sugar  20.7  1.6  6.9  8.5  8.5  6.11e acidit  andardscal  x)  42256361,  24018217,  3617698,  8572045,  17938835,  train_test  a_test_split  chape,y_test  38,))  risticRegre	0.045 0.049 0.050 0.058 0.058  ty", "citr ler , -1, 0, 1, 2, 1.  t_split it(x,y, t st.shape  ession	dioxide  45.0  14.0  30.0  47.0  47.0  ric acid","re  .35885052, .50862326, .25962675, .25561277, .18934965, .06886539,	dioxide  170.0  132.0  97.0  186.0  186.0  28.idual successidual succession successidual succession successidual succession successidual succession successidual successidual successidual successidual succession successidual successidual successidual successidual successidual successidual successidual successidual successidual successi	1.0010 3.00 0.9940 3.30 0.9951 3.26 0.9956 3.19 0.9956 3.19 gar", "chlor	0.45 0.49 0.44 0.40 0.40	8.8 9.5 10.1 9.9 9.9	6 6 6 6
[20]: [21]: [21]: [21]: [22]: [23]: [24]: [24]: [27]: [28]: [29]: [30]: [30]: [31]: [32]: [33]:	y.shape (6459,)  dfl.hea  type  0	quality']  fixed acidity  7.0 6.3 8.1 7.2 7.2 7.2 7.2 7.2 8 "type", "fixed acidscaler (acidscaler (aci	volatile acidity  0.27  0.30  0.28  0.23  0.23  0.23  0.23  2.40  2.7  0.167  2.7  0.167  2.7  0.167  2.7  0.167  2.7  0.167  2.7  0.167  2.7  0.167  2.7  0.167  2.7  0.167  2.7  0.167  2.7  0.167  2.7  0.167  2.7  0.167  2.7  0.167  2.7  0.167  2.7  0.167  2.7  0.17  0.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.10  1	citric racid  0.36  0.34  0.40  0.32  0.32  cty", "volat  fimport St  transform(  76547, -0. 931958], 691924, -0. 253343], 976101, -0. 257387], 691924, 1. 486546], 507041, 1. 574728], 603262, -0. 486546]])  con import  cest =train c, y_train.s  4521,), (19  import Log  city (y_test, y)  recall f1  0.00 0.06 0.58 0.68 0.22 0.00 0.00 0.22	residual sugar  20.7  1.6  6.9  8.5  8.5  ile acidit  andardScal  (x)  .42256361, .24018217, .3617698, .8572045, .17938835,  train_test  a_test_split chape, y_test (338,))  risticRegree  (338,))  risticRegree  (10) (10) (10) (10) (10) (10) (10) (10	orides  0.045  0.049  0.050  0.058  ty","citr ler , -1, 0, 1, 2, 1. t_split it(x,y, t st.shape  ession  support  11 67 643 827 334 555 1 1938 1938	dioxide  45.0  14.0  30.0  47.0  47.0  47.0  ric acid","re  .35885052, .50862326, .25962675, .25561277, .18934965, .06886539,  test_size=0.3	dioxide  170.0  132.0  97.0  186.0  186.0  28.idual successidual succession successidual succession successidual succession successidual succession successidual successidual successidual successidual succession successidual successidual successidual successidual successidual successidual successidual successidual successidual successi	1.0010 3.00 0.9940 3.30 0.9951 3.26 0.9956 3.19 0.9956 3.19 gar", "chlor	0.45 0.49 0.44 0.40 0.40	8.8 9.5 10.1 9.9 9.9	6 6 6 6
[20]: [21]: [21]: [21]: [22]: [23]: [24]: [24]: [27]: [28]: [27]: [28]: [30]: [31]: [32]: [33]:	y.shape (6459,)  dfl.hea  type  0	quality']  fixed acidity  7.0 6.3 8.1 7.2 7.2 7.2 7.2 7.2 8"type","fixed acidity  7.0 6.3 8.1 7.2 7.2 7.2 8"type","fixed acidity  1.0.5721657 -0.5450119 1.0.5721657 -0.6121688 1.469696 1.7477453 1.469696 1.7477453 0.8652836 81 81 81 81 81 81 81 81 81 81 81 81 81	volatile acidity  0.27 0.30 0.28 0.23 0.23 0.23 0.23 0.23 0.26 0.27 0.167 0.27 0.167 0.27 0.167 0.27 0.167 0.27 0.167 0.27 0.167 0.27 0.167 0.27 0.167 0.27 0.167 0.27 0.167 0.27 0.167 0.27 0.167 0.27 0.167 0.27 0.167 0.27 0.167 0.27 0.30 0.424 0.27 0.424 0.30 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.424 0.42	citric racid  0.36  0.34  0.40  0.32  0.32  cty", "volat  fimport St  transform(  76547, -0. 931958], 91924, -0. 253343], 976101, -0. 957387], 691924, 1. 486546], 607041, 1. 574728], 603262, -0. 486546]])  con import  cest = train e, y_train.s  4521,), (19  import Log  city_test, y  recall f1  0.00 0.06 0.58 0.68 0.22 0.00 0.00 0.02 0.52	residual sugar  20.7  1.6  6.9  8.5  8.5  3.11e acidit  andardscal  x)  .42256361, .24018217, .3617698, .8572045, .17938835, .train_test  a_test_split  chape, y_test  338,))  risticRegree  0.00  0.11  0.58  0.58  0.31  0.00  0.00  0.52  0.49	orides  0.045  0.049  0.050  0.058  ty", "citr  ler , -1, 0, 1, 2, 1  t_split  it(x,y, t)  st.shape  ession  y, classifi  1938 1938 1938 1938	dioxide  45.0  14.0  30.0  47.0  47.0  47.0  ric acid","re  .35885052, .50862326, .25962675, .25561277, .18934965, .06886539,  test_size=0.3	dioxide  170.0  132.0  97.0  186.0  186.0  28.idual successidual succession successidual succession successidual succession successidual succession successidual successidual successidual successidual succession successidual successidual successidual successidual successidual successidual successidual successidual successidual successi	1.0010 3.00 0.9940 3.30 0.9951 3.26 0.9956 3.19 0.9956 3.19 gar", "chlor	0.45 0.49 0.44 0.40 0.40	8.8 9.5 10.1 9.9 9.9	6 6 6 6
[20]: [21]: [21]: [21]: [22]: [23]: [24]: [24]: [27]: [27]: [28]: [29]: [30]: [30]: [31]: [32]:	y.shape (6459,)  dfl.hea  type  0	quality']  fixed acidity  7.0  6.3  8.1  7.2  7.2  7.2  7.2  7.2  7.2  7.2  7	volatile acidity  0.27 0.30 0.28 0.23 0.23 0.23 0.23 0.23 0.24 0.25 0.30 0.26 0.27 0.30 0.28 0.23 0.23 0.23 0.23 0.23 0.23 0.23 0.24 0.27 0.30 0.31 0.31 0.31 0.31 0.31 0.31 0.31	citric racid  0.36  0.34  0.40  0.32  0.32  cty", "volat  fimport St  transform(  76547, -0.  931958],  91924, -0.  253343],  976101, -0.  957387],  691924, 1.  486546],  674728],  803262, -0.  486546]])  con import  cest = train  c, y_train.s  4521,), (19  import Log  cest, y_pred  0] 0] 0] 0] 0] 0] 0] 0] 0] 0] 0] 0; ct(y_test, y  recall f1  0.00 0.06 0.58 0.68 0.22 0.00 0.00 0.22 0.52	residual sugar  20.7  1.6  6.9  8.5  8.5  1.1e acidit  andardScal  x)  .42256361, .24018217, .3617698, .8572045, .17938835, .train_test a_test_split chape,y_test 038,)) risticRegree  0.00 0.11 0.58 0.58 0.31 0.00 0.00 0.00 0.52 0.49  PorestClass  red))  red))  red))  red))  red)  red))	orides  0.045  0.049  0.050  0.058  ty", "citr  ler , -1, 0, 1, 2, 1  t_split  it(x,y, t)  st.shape  ession  y, classifi  1938 1938 1938 1938	dioxide  45.0  14.0  30.0  47.0  47.0  47.0  ric acid","re  .35885052, .50862326, .25962675, .25561277, .18934965, .06886539,  test_size=0.3	dioxide  170.0  132.0  97.0  186.0  186.0  28.idual successidual succession successidual succession successidual succession successidual succession successidual successidual successidual successidual succession successidual successidual successidual successidual successidual successidual successidual successidual successidual successi	1.0010 3.00 0.9940 3.30 0.9951 3.26 0.9956 3.19 0.9956 3.19 gar", "chlor	0.45 0.49 0.44 0.40 0.40	8.8 9.5 10.1 9.9 9.9	6 6 6 6
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[20]: [20]: [21]: [21]: [21]: [21]: [22]: [22]: [23]: [24]: [24]: [27]: [28]: [27]: [28]: [30]: [31]: [31]: [32]: [33]: [34]:	y.shape (6459,)  dfl.hea  type  0	quality']  fixed acidity  7.0 6.3 8.1 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2	volatile acidity  0.27 0.30 0.28 0.23 0.23 0.23 0.23 0.23 0.23 0.23 0.23	citric racid  0.36 0.34 0.40 0.32 0.32 0.32 0.32  cty", "volat  fimport St  transform(  76547, -0. 2631958], 261924, -0. 263343], 276101, -0. 2653343], 276101, -0. 2653343], 276101, -0. 265346], 276101, -0. 276346546], 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276101, -0. 276	residual sugar chloses sugar 20.7  1.6 6.9 8.5 8.5 8.5 8.5 8.5 ile acidit andardscal and	O.045  O.049  O.058  O.058  ty", "citr ler , -1, 0, 1, 2, 1. t_split it(x,y, t st.shape  ession  support  11 67 643 827 334 55 1 1938 1938 1938 sifier  support  11 17 643 827 334 55 1 1938 1938 1938 sifier	dioxide  45.0  14.0  30.0  47.0  47.0  47.0  ric acid","re  .35885052, .50862326, .25962675, .25561277, .18934965, .06886539,  test_size=0.3	dioxide  170.0  132.0  97.0  186.0  186.0  28.idual successidual succession successidual succession successidual succession successidual succession successidual successidual successidual successidual succession successidual successidual successidual successidual successidual successidual successidual successidual successidual successi	1.0010 3.00 0.9940 3.30 0.9951 3.26 0.9956 3.19 0.9956 3.19 gar", "chlor	0.45 0.49 0.44 0.40 0.40	8.8 9.5 10.1 9.9 9.9	6 6 6 6
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