Xi'an Jiaotong-Liverpool University
西交利物浦大學

XJTLU Entrepreneur College (Taicang) Cover Sheet

Module code and Title	**DTS201TC Pattern Recognition**
School Title	**School of AI and Advanced Computing**
Assignment Title	**Coursework (Groupwork)**
Submission Deadline	**23:59 10th Dec.**
Final Word Count	
If you agree to let the university use your work anonymously for teaching and learning purposes, please type **"yes"** here.	

I certify that I have read and understood the University's Policy for dealing with Plagiarism, Collusion and the Fabrication of Data (available on Learning Mall Online). With reference to this policy I certify that:

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Scoring – For Tutor Use	
Student ID	

Stage of Marking	**Marker Code**	**Learning Outcomes Achieved (F/P/M/D) (please modify as appropriate)**			**Final Score**
		A	**B**	**C**	
1st Marker – red pen					
Moderation – green pen	**IM Initials**	The original mark has been accepted by the moderator (please circle as appropriate):			Y / N
		Data entry and score calculation have been checked by another tutor (please circle):			Y
2nd Marker if needed – green pen					

For Academic Office Use			**Possible Academic Infringement (please tick as appropriate)**	
Date Received	**Days late**	**Late Penalty**	☐ **Category A**	Total Academic Infringement Penalty (A,B, C, D, E, Please modify where necessary) _____
			☐ **Category B**	
			☐ **Category C**	
			☐ **Category D**	
			☐ **Category E**	

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DTS201TC Classification Demonstration

Coursework (Groupwork)

Assessment tasks:

Classify objects in the image, which is an open dataset called Salinas dataset, which will be provided on LMO DTS201TC module course work material section. The area covered comprises 512×217 samples, and 204 bands. (A tutorial for the understanding of the remote sensing dataset has been undertaken in programming exercise). It includes vegetables, bare soils, and vineyard fields, etc. Salinas ground truth dataset contains 16 labeled classes, which are represented with different colors in Figure 1, (The students are free to use any colors to distinguish these classes).

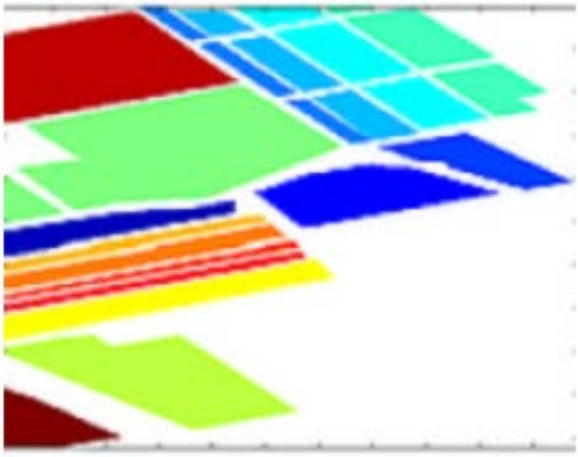

Figure 1. Ground truth of Salinas dataset

Requirements:

1. You are expected to implement classification over the provided dataset with pattern recognition models, to which end, you need to understand and explain your models, manage and analyze the features, implement the models, evaluate each model and make a thorough comparison and analysis. The programming language should be Python.

2. You are free to use supervised, unsupervised classification, clustering methods or others.

3. The number of the models chosen should be the NO LESS THAN the number of group members N. Each one in the group is expected to implement one model.

- If the number of models that one group implements is no less than N, the second part of the group work marks(marking criteria 2) would be total marks of all models divided by the number of models.
- If one group implements less than N models, the second part of the group work marks (marking criteria 2) would be the total marks of all models divided by (N+x), x is the number of models that are missing.

- If 0 models are submitted, the total marks would be 0.
- Quality is more important than quantity.
    - Quality refers to whether the models are implemented well with good understanding.
    - Quantity refers to number of the model, length of report.

4. The mark of the coursework consists of four components, which are illustrated in detailed marking criteria.

5. The assessment includes both report and the codes.

6. Code submitted should be able to run properly and output the results illustrated in the report.

7. If a model's implementation is referred to online resources, e.g., github, to a great extent, it should be clearly and formally noted in reference. Otherwise, it would be considered as plagiarism, and therefore the marks for this model are 0.

8. If a model's implementation is referred to online resources, e.g., github, but you have contributions to it to improve the model, it should also be clearly and formally noted in reference. And you contributions should also be noted.

9. The baseline classification accuracy is 50%, the performance (efficiency/accuracy) of a model will not be additionally evaluated as long as it is above the baseline. The choice of library is not within the evaluation.

Marking Criteria

1. [10 marks] Investigating the dataset. (group work assessment part)

Rubrics	**Marks**	**Marking scheme**	
Brief description of the dataset (officially published information) (no more than 120 words)	3	Not done	0
		Words copy from official website without re-edit and reference	1
		Clear and brief words to describe basic information	2
		Clear and brief words to describe basic information, and mention the percentage of data samples in each class	3
Feature visualization	3	Not done	0
		Simple plot the curve of one sample	1.5
		Show features in more details	3
Comparison of the features space in different classes	4	Not done	0
		Show feature spaces of different classes	2
		Analyse the difference	4

2. [40 marks] Description of the models, parameters, and evaluation on the performance over the model. (This is the total marks of N models, N is the number of models used. Marks in each item listed in the table below would be averaged over all models). (group work assessment part)

Rubrics		**Marks**	**Marking Scheme**
Model brief description (no more than 200 words)		3	These items are given 0 or full mark
Model principle explanation (no more than 200 words)	Principle with equations (only important ones, the derivation process should not be listed if it is not contributing to the explanation).	3	
	Explained with good logic.	3	
	Can relate the principle/theory with the problem you solve.	3	
Model implementation	Clean code without bugs, commented.	3	
	Honest reference if the model's main codes are borrowed. Those who write the main code by themselves would get 2 marks by default.	2	
	Include feature selection or dimension reduction methods.	3	
	Explain how the parameters are estimated or why they are chosen.	3	
	The core code of the model is written by yourself	3	
	Provide the platform information you run your model	2	
	Model implementation include the density/parameter estimation.	3	
Evaluation	Output the accuracy	3	
	Classification result visualization	3	
	Thorough model validation	3	

3. [25 marks] Comparison of the different models and analysis. (group work assessment part)

Rubrics		**Marks**	**Marking Scheme**	
Models comparison	Models chosen are different	2	All models are same	0
			Several of the models are same	1
			All models are different	2
	Description of the performance of each model	4	No description	0
			Described with single point of view.	1.5
			Described with varies perspectives and presented in tables or figures.	4
	Sound reason for choosing these distinguished models	2	No explanation.	0
			Briefly written.	1
			Reasons are illustrated in terms of either practical use or theory.	2
Analysis		5	No analysis	0
			Factually incorrect positions	1

	Your opinion or assumption on why one model is better than the other, or the rest		The analysis and opinions are basically correct	3
			Thorough and correct analysis	5
	Proof of your assumption	3	Not done.	0
			Refer to materials	2
			Self derivation	3
	Limitations	2	No description	0
			Limitation of the overall work is illustrated	2
Conclusion	Summary (no more than 200 words)	4	No summary	0
			Brief summary	2
			Summary/Conclusion with good structure.	4
Others	Novel ideas	3	None.	0
			Novel ideas/algorithms that can contribute to the research field.	3

4. [25 marks] Peer Review (individual assessment part)

Refer to table 1 for peer review.

Table 1. Peer Review Rubrics

marks	5	4	3	2
Contributions	Rountinely provides useful ideas when participating in the group discussion. A leader who contributes a lot of effort.	Usually provides useful ideas when participating in the group discussion. A strong group member who tries hard.	Sometimes provides useful ideas when participating in the group discussion. A satisfactory group member who does what is required.	Rarely provides useful ideas when participating in the group discussion. May refuse to participate.
Problem solving	Actively looks for and suggests solutions to problems.	Refines solutions suggested by others.	Does not suggest or refine solutions, but is willing try out solutions suggested by others.	Does not try to solve problems or help others solve problems. Lets others do the work.
Attitude	Is never publicly critical of the project or the work of others.	Is rarely publicly critical of the project or the work of others.	Is occasionally publicly critical of the project or the work of other	Is often publicly critical of the project or the work of other

	Always has positive attitude about the task(s).	Often has a positive allude about the task(s).	members of the group. Usually has a positive attitude about the task(s).	members of the group. Is often negative about the task(s).
Focus on the task	Consistently stays focused on the task and what needs to be one. Very self-directed.	Focuses on the task and that needs to be done most of the time. Other group members can count on this person.	Focuses on the task and what needs to be done some of the time. Other group members must sometimes nag, prod, and remind to keep this person on task.	Rarely focuses on the task and what needs to be done Lets others do the work.
Working with others	Almost always listens to, shares with, and supports the efforts of others. Tries to keep people working well together.	Usually listens to, shares with, and supports the efforts of others. Does not cause "waves" in the group.	Often listens to, shares with, and supports the efforts of others, but sometimes is not a good team member.	Rarely listens to, shares with, and supports the efforts of others. Often is not a good team player.