

# **Use multilayer perceptron to find how gender and guardian's gender influence a student's grade**

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**Abstract:** This article is about using multilayer perceptron to analyze the influence of gender and guardian's gender on a student's grade. The data set is from the UCI Machine learning Repository. The result is there are no significant difference on grade between male and female.

**Keywords:** student, grade, UCI, multilayer perceptron

## **1 Introduction**

First of all, to save your time, I need to explain that limited by my poor programming skills, this research haven't get fully applied. So, I will further research base on other researches.

The reason I is because as a student I always try to get a better grade. So, after I learned neuron network, I start think if there are a way to find the factors that influence students' grade. And that's how I start.

As I said my coding skill is poor so my research method is mostly based on the practice of lab 1.

## **2 Method**

This tasks can be divided into 4 steps.

First, data load and preprocess. Load the dataset in to task.py for further research. Then, reset the value of sex from male and female to 01 and 0, and reset guardian from mother, father and other to 0, 1, 2. the reason for doing this is turn string value in to numeric value which help to classification.

Second, construct a multilayer neuron network that include 1 input layer, 1 output layer and a hidden layer. Since the I/O layer is main base on the dataset, the only thing I can modify is the hidden layer. After set the number of neurons and learning rate, training process start. Generally, the more neurons in hidden layer, the more accurate that whole network is.

Third, train the system. As we know, the more train it takes, the more accuracy it is.

Forth, test the system. Collect all the data include error, accuracy, etc.

## **3 Results and Discussion**

Generally, there are no significant difference between female and males (table 1). As well as there guardian's gender. But through the research, I find that female students usually do better in study process and male students good at get a high marks in final exam.

So, if I am a teacher, I well keep an eye on the attendance and assignment completion of male students and encourage female students to do more preparation on final exam. There are also no significant difference between student who have different type of guardian. However, I think that the family situation still have a major impact on students' grades.

## 4 Conclusion and future work

Above all, as far as I found, there are no difference for student in different gender or with guardian in different gender. But there could be more deep impact of gender and guardian to a student.

For future research, with the goal of finding the factors that influence student's grade, here are somethings I would do.

First, load more data. Not only the gender or guardian but also other statics like the grade of other semesters, other subjects.

Then, construct a more complex network. Using LSTM may help, because there could be related of the grades from a same person.

## 5 References

1. Gedeon, T. D. and Turner H. S.: Explaining student grades predicted by a neural network. International Joint Conference on Neural Networks (1993)
2. Ludmila D., Andrea J., Jiri F., : Influence of Gender and Other Factors to Final Grade .International Education Studies; Vol. 8, No. 4; 2015

## 6 Appendix

Table 1 [Ludmila D., Andrea J., Jiri F.]

	<i>Gender</i>		<i>Branch of study</i>	
	Statistic	p-value	Statistic	p-value
Points from semester	6661.5	0.136	6911	0.275
Points from the theoretical part of the examination test	7661.5	0.127	8291	0.577
Points from the practical part of the examination test	6727	0.058	7097	0.164
Bonus points	6948.5	0.009	7496.5	0.083
Points from the oral part of the exam	6661.5	0.136	8100.5	0.380
Final grade	7273	0.290	6911	0.275