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RESEARCH ARTICLE

ANALYSIS REPORT ON TALENT DEMAND IN SMART CITIES

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ABSTRACT

Inviting wits and attracting talents is one of the highlights for many cities over the past couple of years. Beijing, Shanghai, Wuhan, Chengdu, Xi'an, and Shenzhen are actually competing for talents with various attractive policies. Talents represent the motive power for the innovative development of cities because of their ability to learn better skills, make better products, and master better management methods within a shorter time. Talents are the major driver for urban innovation diffusion, since innovation diffusion is achieved by promoting new processes and technologies through high-quality talents are the media. In cities today, talents are recruited via the internet, on-campus job fairs, and open recruitment events in addition to local talent markets. Therefore, the analysis of urban talent demand is particularly important. This paper analyzes the development trend of the city and the demand for talents by modeling and analyzing the data of talent supply and demand in a city in China in the past four years. Finally, combined with China's current employment situation and the form of talent demand, the government and schools have put forward suggestions on attracting talents and cultivating talents.

INTRODUCTION

Currently, we have obtained data on talent demand in various industries in a city(A-city) in China. The first step is to model and analyze the talent needs of the "A City Employment Market" based on the data, job requirements, required occupations and required educational background. The second step. According to the talent demand of "A City Employment Market" and the employment situation of Chinese students, according to the data and other necessary methods, the data of the actual talent demand model of A city can be established, and the potential talent demand of A-City in the next three years will be predicted and analyzed. third step. Try to use the data and conclusions from the second step to infer A-City's administrative categories, possible geographic areas, economic status, and high-tech industry development. The fourth step. In recent years, college students have had some new career preferences, such as taking part in village official examinations, taking civil service exams, starting their own businesses, working in different places, and studying abroad. These preferences help to diversify the employment opportunities of college graduates. Try to model and quantify this phenomenon and provide strategies for A-City's urban development and talent introduction. the fifth step. Suggestions for the training of professional talents in schools, including curriculum construction, application-oriented talent training, individualization of college students, and the corresponding quality according to the current market demand for talents.

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MATERIALS AND METHODS

First, we need to analyze the data given, and do the corresponding screening, statistics and pre-processing. Secondly, quantify the concept of talent demand and establish indicators that can represent the above three aspects. Then, using SPSS software, the relationship between talent demand and three indicators was obtained by multiple linear regression method, and the obtained results were analyzed. Finally, the association analyzes these three aspects. Then, the number of Chinese graduates in 2011 and the employment rate in various industries from 2011 to 2018 was obtained by consulting the data. These data and LSSVM were used to correct the first question model. Finally, the improved model and the combined talent prediction model based on the ARIMA model are used, and then the model is fitted using Matlab to ensure the accuracy of the model. After that, the city's potential talent demand for the next three years will be predicted. The location entropy (LQ) examines the relative concentration of spatial distribution of various industries in the national economy. Its most basic meaning is to reflect the export orientation of a region. Using this meaning, we can speculate that if China is divided into several regions, each region has its specific LQ value, and the LQ value of City A is compared with the LQ

value of each region we have previously delineated. The area closest to City A is the area where A is most likely to be located. According to this principle, we can get the possible administrative divisions, geographical areas, and economic locations of City A. Comparing the talent demand data sheets for the two years from 2011 to 2012, it was found that the demand for talent in the two years of 2011 and 2012 was much higher than in the following years. Therefore, we have reason to speculate that there are some special circumstances in the city of A at the end of 2012, resulting in a huge loss of talent in the city. In order to enable the rapid influx of talents in City A, firstly, classify the employment choices of college students, and use questionnaires and access to data to obtain 500 employment choices, family backgrounds, and academic qualifications of Qingdao university students. As a eigenvalue, the K-means cluster analysis is used to build the model.

RESULTS AND DISCUSSION

Problem hypothesis

- Assume that the data source is reasonable and authentic
- Assume that in the next three years, there will be no major accidents such as the financial crisis in the city.
- Assume that the people participating in the survey are randomly distributed

Data preprocessing: The sectors in the data can be divided into eight categories according to their occupational attributes. The classification results are as follows:

Symbol Description

Table 5.2.1. Occupational attributes

Sales Industry	Sales management
	market/marketing
	Sales
	Procurement
	Trade
	Real property
	Property management
	Restaurants & recreation
	Hotels/tourism
	Beauty and personal care
	General merchandise/chains/retail
	Fashion/textile/furs
technology	Computer software
	Computer hardware
	Internet development and application
	IT-Management
	IT-QM, technical support and more
	Communications technology
	Electronics/appliances/semiconductor/instrumentation
	Science & Technology
	Technical work
Finance	Finance/auditing/tax
	Securities/finance/investment
	Insurance
	Banking
Public Service	Education
	Logistics/warehousing
	Legal profession/law
	Hospital/medical/care
	Counsel/consulting
	Customer service and technical support
	QMS/safety/environmental protection
	Biology/chemicals/pharmaceuticals/medical equipment
	Security/housekeeping/other
	Transportation service
	Translation
Manufacturing	Engineering/machinery/energy
	Construction/infrastructure/gardening
	Production/operation
Administration	HR
	Senior management
	Office administration/logistics
Media design	Art/graphics/Animation design
	Advertising
	PRs and news media
	Movies, TV and recreation
	Literature/screenwriting/writing
Other	Other

Solution of problem one

Data processing

The topic requires modeling the talent needs. First, we consider quantifying the talent needs. According to the information on the Internet, talent needs include talent quality and number of talents, and the quality of talents can be directly reflected through the qualifications. The number of talents can be expressed by the number of jobs provided by employers. So we define the talent needs as. Among them, the number of talents representing, the degree indicates the weight of the i-th degree. According to the actual situation, the quality of talents is usually related to salary, and the wages of high-quality talents are also higher. By consulting the data, we determine the weight of each academic qualification according to the average monthly salary of the 2018 college students in China. Among them, each degree and account as shown in the table below (unlimited average salary here). The weight determined by the above table can be calculated as the monthly talent demand in the data:

Table 5.3.1. Symbol description

Symbol	Description
Q	Talent Demand
T	Career expectation
A	Number of applicants
P	Number of applicants
LQ	Location entropy

Table 5.4.1.1. Average monthly salary of Chinese 2018 college students

Educational Background	Percent	Salary
Junior middle school	5.25%	2969
Senior middle school	6.46%	3654
Technical secondary school	7.08%	4006
Junior college	7.84%	4432
Bachelor's degree	8.58%	4854
Master's degree	12.19%	6891
Doctor's degree	17.84%	10089
MBA	23.64%	13365
Unlimited	11.11%	6282

Model establishment: Using multiple linear regression equations and SPSS software, the following three aspects are analyzed:

Job requirements: The job requirements reflect the degree of need for the job as well as the number of candidates. Here we separately count the number of individual job requirements by job category. The talent demand is recorded as y, and the impact variables of various job requirements are respectively calculated as . The data of 2015.9-2018.8 for 36 months are separately calculated, and the 36 sets of data obtained are subjected to linear regression analysis. The results are as follows: The value of R Square is 0.996, which indicates that the regression line fits the observations very well, so the regression equation can be obtained as: Analysis of the equation shows that the variables, and have the largest coefficients, so the market demand is mainly related to sales, technology and public services, accounting for 31.6%, 15.79% and 27.4% respectively.

Expected occupation: Given the different levels of competition in different occupations, the level of supply and demand in the profession also affects the demand for talent. Here we define occupational expectations.

Table 5.4.2.1.1. Job requirements-Linear regression coefficient

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	17.448	7.160		2.437	.022
	x1	.060	.001	.539	8.585	.000
	x2	.030	.004	.053	1.665	.107
	x3	.007	.007	.033	1.130	.268
	x4	.052	.006	-.107	-1.654	.110
	x5	-.009	.008	.158	3.842	.001
	x6	.006	.013	.228	4.022	.000
	x7	.012	.032	.075	1.883	.070
	x8	.014	.003	.103	4.097	.000

Table 5.4.2.1.2. Job requirements-Summary of linear regression coefficient models

Model Summary							
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	.998[a]	.996	.994	20.97151	.996	760.759	8

Table 5.4.2.2.1. Expected occupation-Linear regression coefficient

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-682.745	590.287		-1.157	.258
	t1	-3.121	44.874	-.013	-.070	.945
	t2	13.760	14.214	.152	.968	.342
	t3	-1.317	30.400	-.008	-.043	.966
	t4	75.019	45.381	.384	1.653	.110
	t5	55.752	37.168	.270	1.500	.145
	t6	235.471	138.421	.297	1.701	.100
	t7	4.700	52.256	.015	.090	.929
	t8	-55.258	33.818	-.347	-1.634	.114

Table 5.4.2.2.2. Expected occupation -Summary of linear regression coefficient models

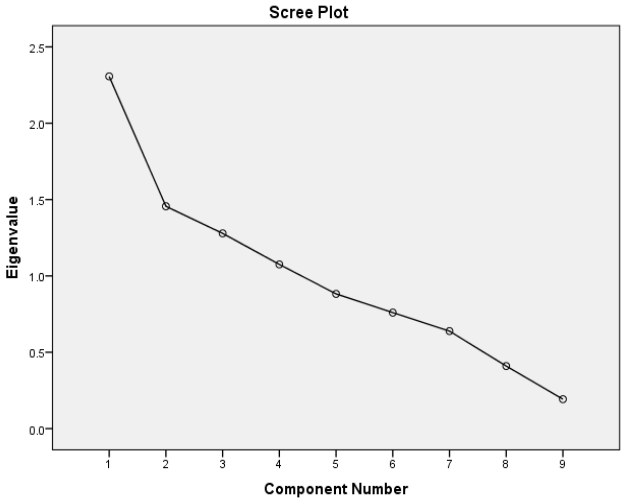
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	.593[a]	.351	.159	254.18628	.351	1.826	8

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.432
Bartlett's Test of Sphericity	Approx. Chi-Square	57.867
	df	36
	Sig.	.012

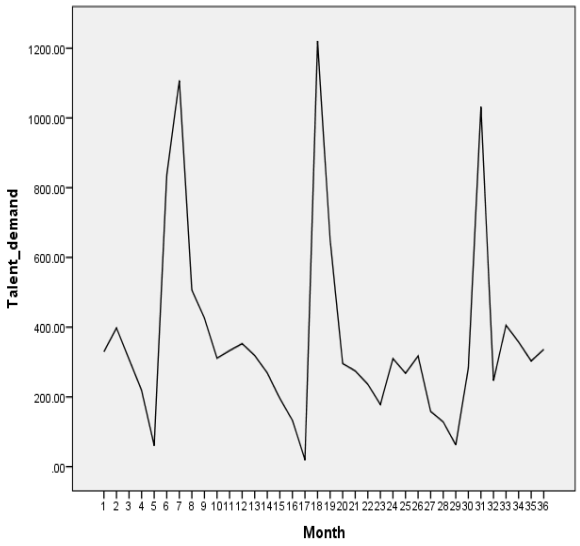
Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.307	25.630	25.630	2.307	25.630	25.630
2	1.456	16.178	41.808	1.456	16.178	41.808
3	1.279	14.207	56.015	1.279	14.207	56.015
4	1.075	11.948	67.963	1.075	11.948	67.963
5	.882	9.805	77.767			
6	.760	8.442	86.209			
7	.639	7.095	93.305			
8	.410	4.553	97.858			
9	.193	2.142	100.000			

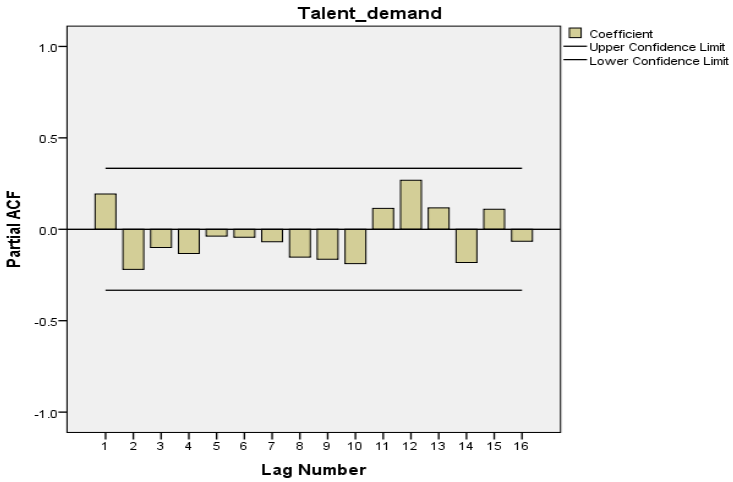
Component Score Coefficient Matrix				
	Component			
	1	2	3	4
x1	.339	-.035	-.130	.043
t1	.238	.244	-.084	-.298
t2	.003	-.054	.113	.801
t3	.296	-.132	-.083	.040
t4	.271	.424	.202	.095
t5	.285	-.129	.212	.125
t6	-.011	.268	-.607	-.001
t7	-.043	.127	.527	-.331
t8	-.135	.567	.084	.248



Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.309	1.254		.247	.807
	Below_bachelor	.490	.001	.962	84.466	.000
	Bachelor	.054	.018	.044	3.089	.004
	Above_bachelor	.224	.061	.033	3.677	.001

Model Summary[b]						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	1.000[a]	1.000	1.000	4.46008	1.000	45041.247





Where represents the number of applicants for the i-type occupation and represents the number of occupations for the i-type occupation. This indicator reflects the popularity of a profession in the market, and the higher the occupational expectation, the more popular the profession. After classifying occupations, the talent needs can be analyzed according to the expected level of each type of occupation. Similarly, the 36-month career expectation and talent demand were analyzed by regression analysis. The results are as follows: The analysis shows that the value of is only 0.351, which indicates that the regression result is not very accurate. Therefore, this function model is very unreasonable.

It is necessary to discard this model and consider the multi-linear interaction model. The method is as follows: First, perform a correlation analysis on all variables. The KMO value is less than 0.5, and the sphericity test p value is 0.012, indicating that there is a certain correlation between the eight variables, and the principal component analysis can be performed, and then the principal component and the common factor are extracted: It can be seen from the table that the first four components can explain the variance of 68%, and the gravel map shows that the steep part of the front has a large eigenvalue and contains a lot of information. The latter is relatively flat and contains less information, so before extraction. Four are the main explanatory variables.

Therefore, the factor score function can be obtained:

Using formula: According to the unit eigenvector of the principal component, the following regression equation x can be obtained: The analysis coefficient shows that sales, electronic technology and public services account for the largest, 21.7%, 17.5% and 15.4% respectively. Therefore, the occupational expectations of the three industries have a greater impact on talent demand.

Educational background required: Using the same method, the educational background can be divided into three categories, namely, lower bachelor, bachelor and above bachelor, and the data of 2015.9-2018.8 for 36 months are respectively counted, and the 36 sets of data obtained are subjected to linear regression analysis. as follows: It can be seen from the results that the value of is 1, indicating that the regression line fits the observations very well, so the regression line equation is:

Analysis of the equation shows that bachelor's following qualifications have the greatest impact on talent demand, with a weight ratio of 70.3%.

Comprehensive analysis: Comprehensive analysis of the talent demand of the city A, whether in the market demand or career expectations, sales technology and public services occupy an absolute dominant position, and in terms of education, the following qualifications of bachelor have the greatest impact on the talent demand structure of the city A, occupying 70%.

Solution of Problem 2

Description of the ARIMA model: The data sequence formed by the prediction index over time is regarded as a random sequence. The dependence of this set of random variables reflects the continuity of the original data in time. On the one hand, the influence of the affected factors, on the other hand, is affected by the law of self-change, assuming that the influencing factors are , , …, and there is regression analysis:

Where Y is the observed value of the predicted object and Z is the error. As the prediction object Yt is affected by its own change, its law can be expressed by the following formula x: The error term has a dependency relationship at different times and is represented by the following formula:

Thus, the ARIMA model expression is obtained:

Establishment of a combined talent demand model: In view of this problem, it is necessary to take into account the deviation of the actual employment situation of Chinese students on the model. Therefore, based on the ARIMA model, a combined talent demand model is established. The steps are as follows:

Data collection and preparation: The employment rate and number of graduates of Chinese students in 2011-2018 were obtained by consulting relevant materials.

The employment rate and number of graduates of Chinese students in 2011-2018. And make a time series diagram of the talent demand in the first step. It can be seen from the above figure that talent demand has a clear cyclical trend, so there is no need to do seasonal decomposition. Then, an autocorrelation analysis of talent needs is performed as follows:

As can be seen from the above figure, the ACF map of talent demand is stable, so it is reasonable to use the first-order differential ARIMA (1, 1, 1).

Model establishment

- Using ARIMA to establish a linear prediction model for, the obtained prediction result is , then at t time, the residual between the ARIMA prediction result and the original prediction result is .
- Since ARIMA predicts the linear change of talent demand, its nonlinear part is implicit in {e}. By using SVM to model and predict {e}, we can mine the nonlinearity in talent demand. Letter interest. Let the residual value at time t be associated with the first m residuals, then the residual is calculated as

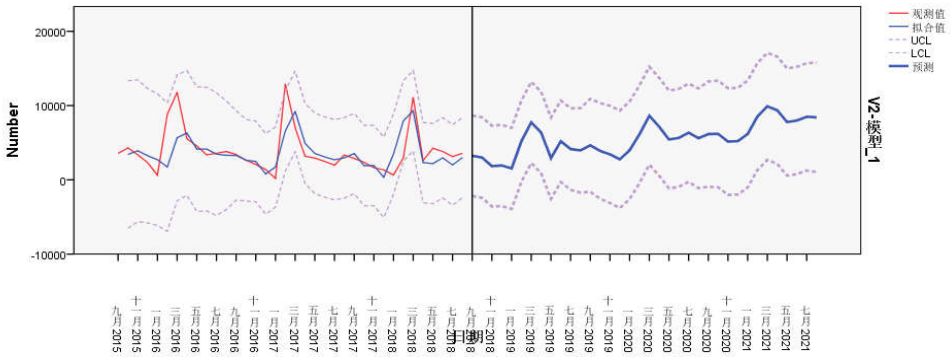
Where is a random error and is a nonlinear function, which is approximated by SVM to obtain a prediction result of .

- Combine ARIMA and SVM prediction results to get the final forecast result of talent demand .

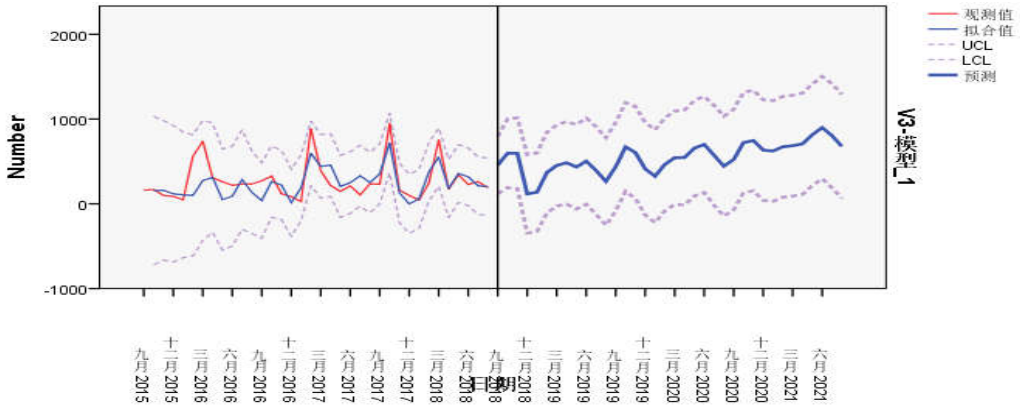
From the perspective of the talent demand combination forecasting modeling process, the linear part is described by ARIMA, and the SVM describes the nonlinear part, which fully exploits the strengths of the two models, makes up for their respective shortcomings, and improves the prediction of talent demand.

Solution of the combined talent demand model: The following results can be obtained by ARIMA analysis using SPSS software.

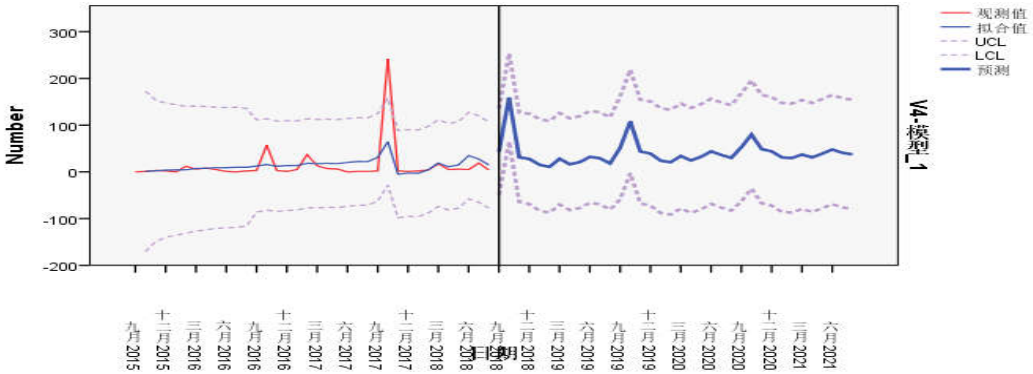
5.2.3.1 Results by academic qualifications



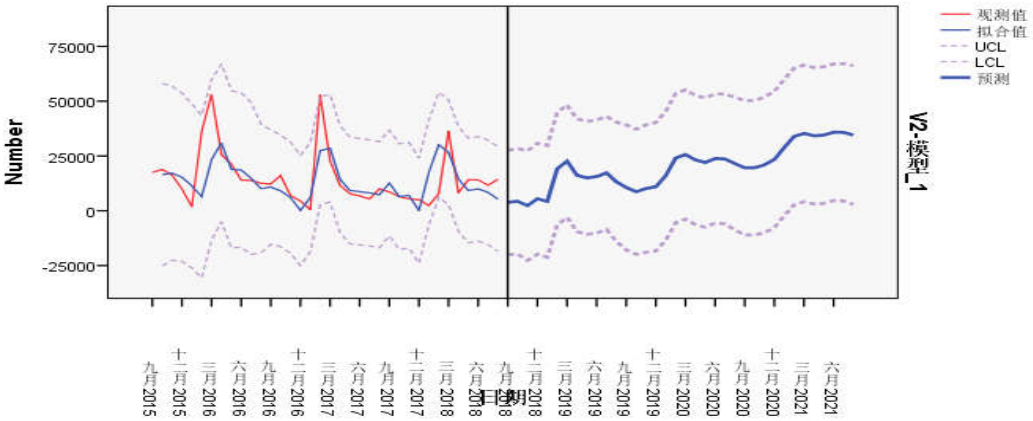
5.2.3 the prediction of below bachelor



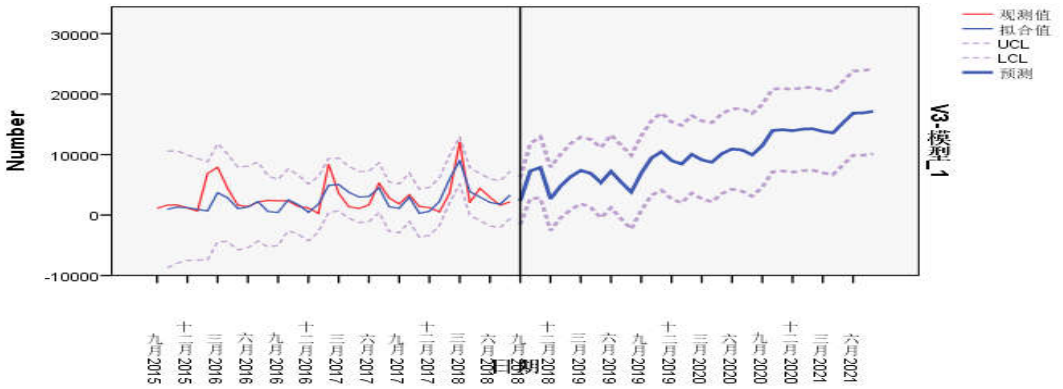
5.2.4 the prediction of bachelor



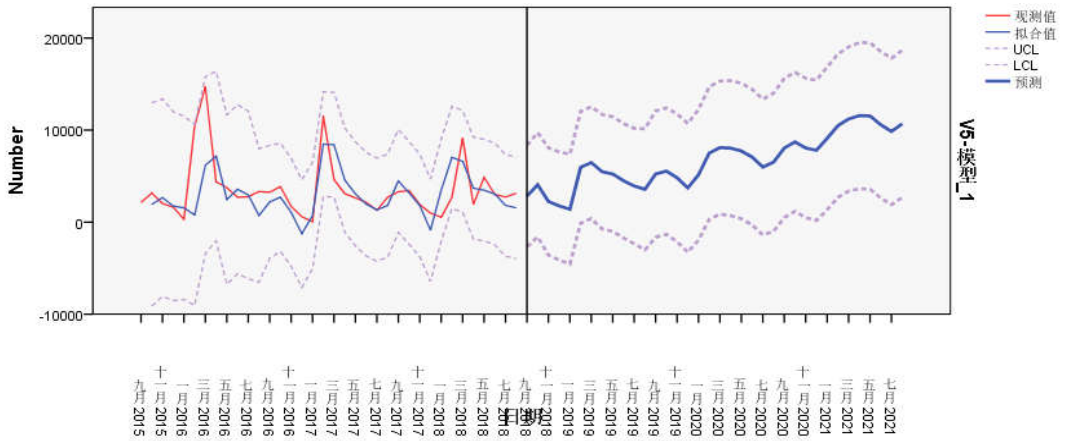
5.2.5 the prediction of above bachelor



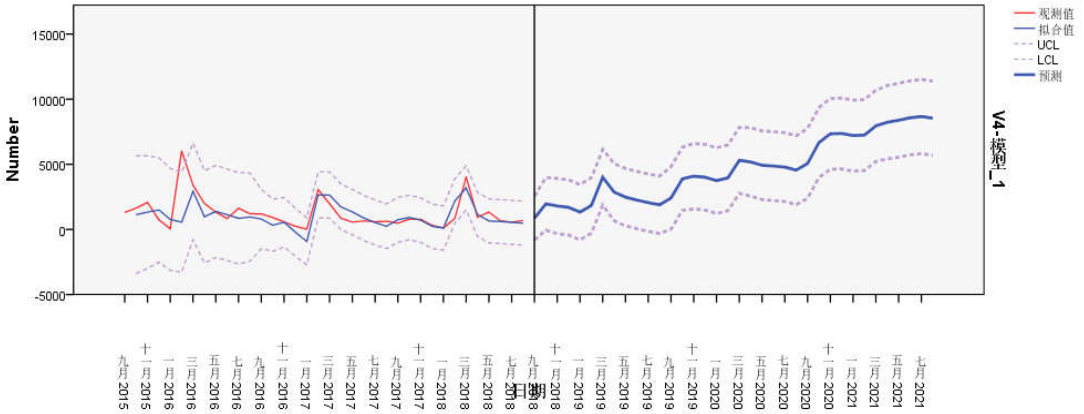
5.2.6 The prediction of Sales Industry



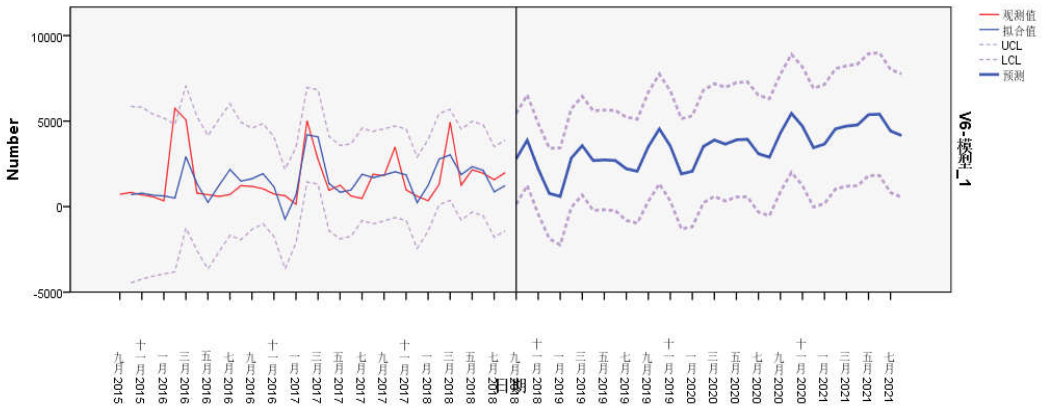
5.2.7 The prediction of Technology



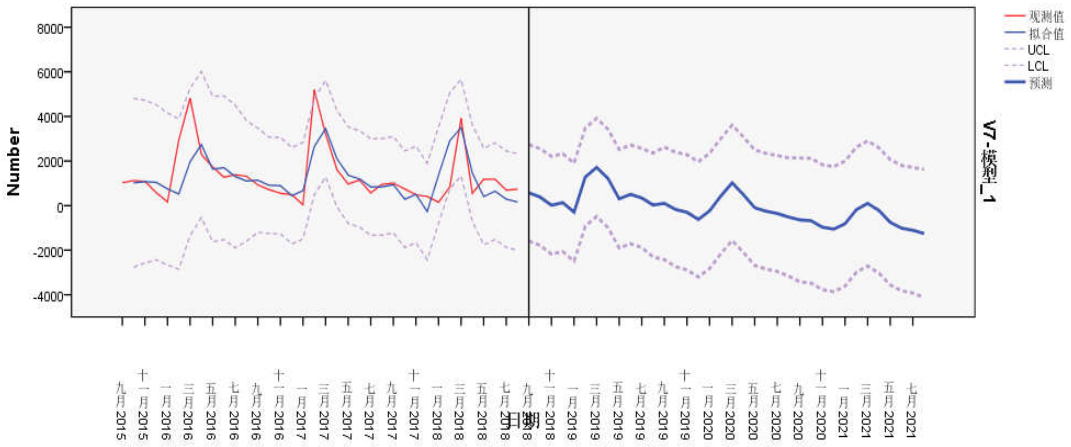
5.2.8 The prediction of Finance



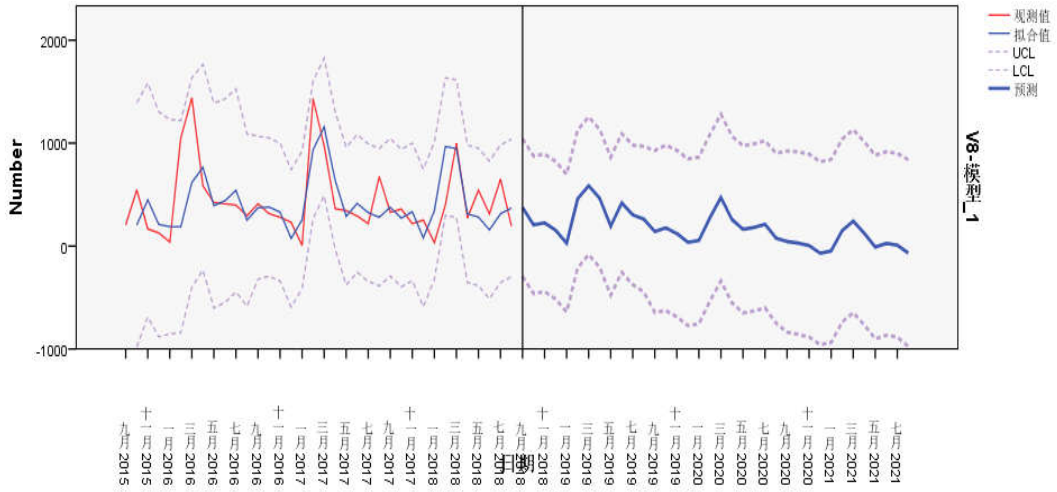
5.2.9 The prediction of Public Service



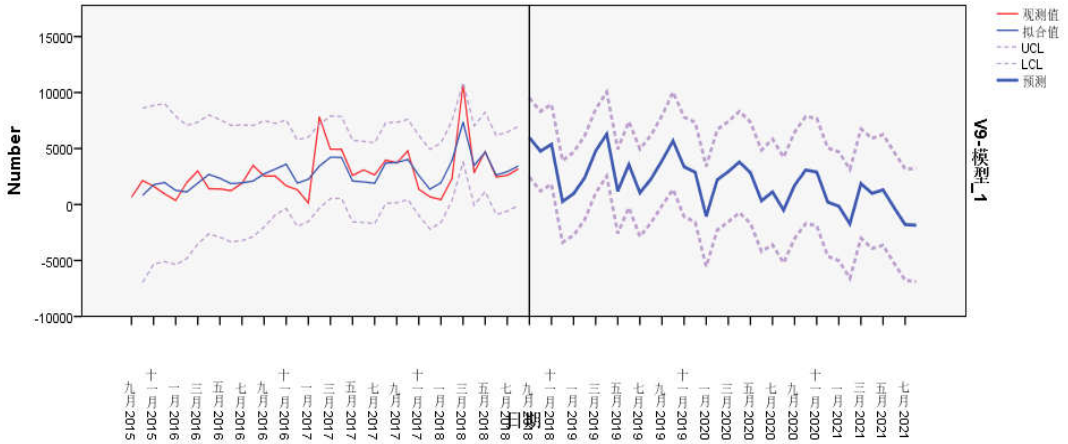
5.2.10 The prediction of Manufacturing



5.2.11 The prediction of administration



5.2.12 The prediction of Media Design



5.2.13 The prediction of Other

Table 1 Urban centrality evaluation index system of A economic zone

index	Portion
Business	0.36
Electronic technology	0.1
Financial	0.06
Public service	0.13
Manufacturing	0.08
Administration	0.11
Culture	0.03
Others	0.1

单位：万人

年份 地区	合计	农、林、牧、渔业	采矿业	制造业	电力、热力、燃气及水生产和供应业	建筑业	批发和零售业	交通运输、仓储和邮政业	住宿和餐饮业	信息传输、软件和信息技术服务业
2014	18277.8	284.6	596.5	5243.1	403.7	2921.2	888.6	861.4	289.3	336.3
2015	18062.5	270.0	545.8	5068.7	396.0	2796.0	883.3	854.4	276.1	349.9
2016	17888.1	263.2	490.9	4893.8	387.6	2724.7	875.0	849.5	269.7	364.1

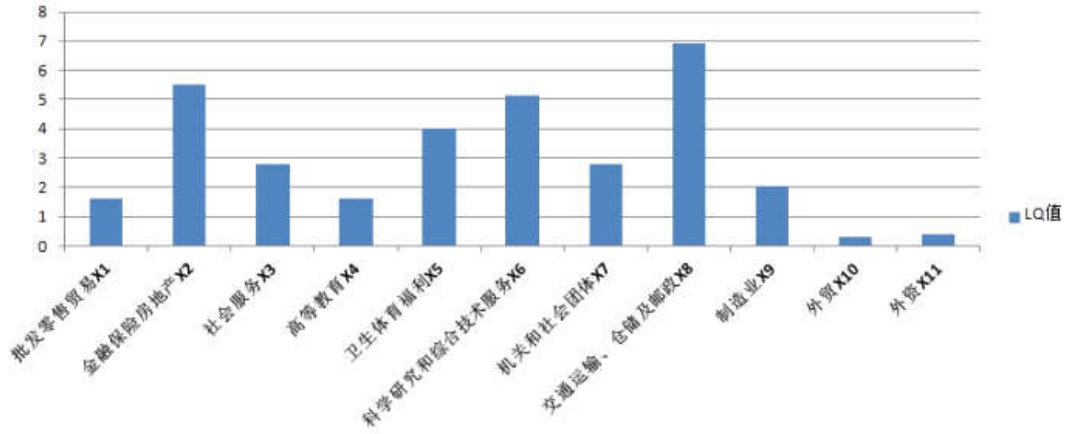
年份 地区	金融业	房地产业	租赁和商务服务业	科学研究和技术服务业	水利、环境和公共设施管理业	居民服务、修理和其他服务业	教育	卫生和社会工作	文化、体育和娱乐业	公共管理、社会保障和社会组织
2014	566.3	402.2	449.4	408.0	269.1	75.4	1727.3	810.4	145.5	1599.3
2015	606.8	417.3	474.0	410.6	273.3	75.2	1736.5	841.6	149.1	1637.8
2016	665.2	431.7	488.4	419.6	269.6	75.4	1729.2	867.0	150.8	1672.6

Graph 3.3.2

	Business	Electronic technology	Financial	Public service	Manufacturing	Administration	Culture	Others
A city	0.36	0.10	0.06	0.13	0.08	0.11	0.03	0.11
country	0.09	0.42	0.034	0.28	0.51	0.015	0.008	0.015

Table 2.2 8 industry location entropy in A city

X1	X2	X3	X4	X5	X6	X7	X8
4	0.24	1.76	0.46	0.16	0.73	3.75	7.3



1	Village official	4	Study abroad
2	Civil servant	5	Local employment
3	Self-employment	6	Employment in different places

Family background can be divided into four levels: A, B, C, and D according totheir annual income

A	Above 800,000
B	Above 150,000
C	Above 80,000
D	Above 30,000
E	Above 30,000

Final Cluster Centers

	Cluster 1	Cluster 2
VAR00001	3.55	3.67
VAR00002	2.27	2.33
VAR00003	1.72	5.15

a certain position in the province or the whole country, and measure the strength of the industrial advantage according to the size of the location entropy. Generally speaking, if the location entropy of the industry is greater than 1, the industry has a clear comparative advantage in the local area; otherwise, the industry has a weaker comparative advantage in the local area.

Location Entropy and Analysis: According to the relevant indicators in the central city index system of Table 2.1, the data of the relevant statistical yearbooks from 2014 to 2016 are found. The data is shown in Figure 3.3.2, and 19 of them are divided into 8 categories, and the average of these three years is taken. Value, get the table. The total range of location entropy calculated at this time is the whole country, that is, the central position of city A in the country. According to this method, the location entropy data of each city in the area is calculated, and the location entropy values of six cities in the A economic zone are obtained (see Table 2.2) Graph 3.3.2

Graph 2.1 8 industry location entropy in A city: As can be seen from Figure 2.1, the average number of location entropy values in the city of A is close to 4, indicating that NN's commercial and public service industries are relatively developed, and it means that the centrality of the country is also in a higher position. The country is divided into East China, South China, North China, Southwest China, Northeast China and Northwest China.

Comparing the location entropy values of various cities in A city, it is speculated that A city should belong to East China. High-tech industry development. It can be seen from the industry location entropy of the 8 major categories of A city that the high-tech industry represented by electronic technology has a low location entropy of only 0.24, indicating that the development level of high-tech industry in A city is relatively backward in the country. position. As for the administrative region, since the economy of A city is not developed, it is speculated that it is not a provincial capital or a municipality directly under the central government, and it may be larger in a prefecture-level city.

Question 4

Data acquisition and preprocessing: Through the form of questionnaires, 500 relevant college students from Qingdao were obtained, including employment choices, family background and academic qualifications. Among them, employment choices are divided into village officials, civil servants, self-employment, study abroad, local employment, and employment in different places according to the employment categories of contemporary college students. The academic qualifications are represented by the three forms given in the data by 1, 2, and 3 respectively. Below bachelor, bachelor, above bachelor.

K-means cluster analysis: Cluster analysis of the questionnaire using spss, the answer is below.

Advice: According to the conclusion that A derived from question 3 belongs to small and medium-sized cities, we directly analyze the talent introduction strategy of this large-scale city in small and medium-sized cities.

Analysis of talent dilemma and its causes in small and medium-sized cities

Objective reasons

- The level of urbanization is low, the overall strength is not strong, and it is inherently insufficient. Small and medium-sized cities have a small amount of industrial development, small scale enterprises, lack of key technologies, weak economic strength, limited market development space, and cannot provide enough jobs and development space for talents to play a role.
- The infrastructure is weak, the traffic is underdeveloped, and the information is not working. Small and medium-sized cities have poor gathering capacity and poor radiation capacity, and urban infrastructure and public service levels are far less than those of big cities. The three-dimensional transportation network and superior educational resources, superior medical and medical conditions, and household dividends in large cities are all in quality and quantity. Incomparable in small and medium-sized cities, the market rule determines the imbalance of talent flow. In the fierce competition in the talent market, the elements of high-quality talent resources will be more and more rapidly transferred and flowed to large cities. effect.
- Human geography and working environment are not satisfactory. In small and medium-sized cities, due to the small flow of people and relatively occluded information, there are fewer channels for new information and new things to acquire. The information is slightly lagging behind the big cities, resulting in a narrow vision and narrow vision. It is conservative in terms of cultural concepts. Closed.

Subjective reasons

- The ideological concept is backward and the strategic position of talent is neglected. Small and medium-sized cities promote the development of urban economy and society. They still stay on the model of relying on investment promotion. They are not liberated and their talents are old. They still put the explicit factors such as funds and projects in the first place. They are obsessed with only focusing on projects and catching funds. The status and role of the era of innovation-driven development lacks a deep understanding, and lacks the sense of crisis and urgency of talent introduction.
- Lack of characteristics, and systemic operability of policy making is not strong. First of all, the level of urban development is different, the direction of industrial development is different, and the talents needed are different. The introduction of talents is not a “face project”, but it is not fashionable, but it is a long-term accumulation; second, small and medium-sized cities are in big cities. The conditions for talent competition and the possession of chips are completely different, but most small and medium-sized cities adopt adopting policies when formulating policies for introducing talents, copying the policies of big cities, and emulating the benefits of high-paying, housing, and hukou in big cities. The treatment attracts talents, and the big cities are hard-hitting, with the “bunker vs. bunker”. Such a policy not only reflects the inaccurate positioning of small and medium-sized cities, but also results in eggs hitting stones,

with little effect, even causing stable talents and attracting talents. The new contradiction has a phenomenon of "leading the female swearing away."

Analysis of talent development advantages in small and medium cities. Due to the geographical environment, large cities rely on superior economic conditions, location advantages and preferential policies, and the industrial transfer and urbanization and industrialization process continue to be faster than that of small and medium-sized cities, making a typical annas shape between big cities and small and medium-sized cities. Industry gradient. It is the difference in economic development and industrial structure between big cities and small and medium-sized cities, which provides conditions for small and medium-sized cities, highlighting the potential advantages of small and medium-sized cities in the competition for introducing talents with big cities.

Resources: With the rapid economic growth of large cities, the consumption of land and natural resources is increasing, and the resource constraints they face are increasing. Small and medium-sized cities have sufficient resources and low production cost advantages, allowing talents to make full use of abundant natural resources, product development, innovation and conversion of research and development results.

Economic growth potential: Since the new century, China's small and medium-sized cities have experienced rapid economic growth.

In particular, in recent years, small and medium-sized urban areas have given full play to the advantages of abundant resources and great market potential, vigorously promoted the process of urbanization, actively carried out industrial transfer at home and abroad, and paid more attention to economic restructuring and independent innovation. Regional development potential has been continuously released, and regional development has been Coordination has increased and new impetus for economic growth has continued to grow. From the perspective of development trends, China's economic growth will continue in the west and east. With the adjustment of the eastern economic structure, the economic growth rate will gradually slow down due to the deepening of the transition. The growth rate of the central and western regions will be significantly faster than that of the east. The inland provinces will usher in more development opportunities, and the development potential and space will be further released. Expansion, this will help small and medium-sized cities in the central and western regions to attract talents and retain talents.

5.5 Solving Problem 5.

Disciplinary construction and professional construction are the main contents of university construction. Discipline construction focuses on academic development and scientific knowledge innovation. Professional construction focuses on the cultivation of talents. It is closely related to the needs of social talents. Talent demand is the fundamental driving force and source of professional construction in colleges and universities. Although the development and reform of college professional construction should be based on talent demand, colleges and universities should not blindly and utilitarianly flatter social needs, and adjust their professional construction with professionalism, because colleges and universities also carry scientific knowledge and scientific research. responsibility. Therefore, when conducting professional construction, colleges and universities should scientifically take the needs of social talents as the guide, handle the relationship between discipline construction and professional construction, make professional adjustments in time, strive to adapt to social needs, and implement the personnel training and social service functions of colleges and universities.

- The training objectives are not clear enough. In general, the outline document can be a global requirement for all aspects from a relatively high latitude, but at the same time the corresponding rules need to be given. As can be seen from the above nine items, the school's training program is generally too simple. For example, in the ninth article, students are required to master basic algorithm design capabilities, but what is the basic algorithm design ability? What specific aspects does it need to include? Not given in it. The lack of clear training objectives will result in students' lack of clear learning goals and will greatly affect the final level of students' learning.
- The theory of the course is too strong and the ability to practice is not reflected. According to many students, many courses are talking about theory. It is difficult to start with the practical application of extracurricular activities. Although theory is the cornerstone of practice, at the same time, too much lack of practice will not only make students' understanding of the theory not deep enough, but also make the students' hands-on ability grow. The strength of students' practical ability in school largely determines the ability of students to adapt to work after graduation. Failure to pay attention to the cultivation of practical ability will lead to the separation of students from the society, so that the employment direction of students after entering the society is not clear enough, resulting in sorrow, anxiety and other defects.
- Lack of interaction. Teaching methods are not flexible enough. For a long time, the course teaching has mainly adopted an indoctrinating teaching method. This method does not have the advantages of the open teaching methods such as heuristic and discussion, which fully mobilize the students' subjective initiative. Ignore the student's subject status. The traditional teaching mode of the course is based on theoretical courses, supplemented by a small number of experiments. The interaction with students can only be through homework and experiments. Therefore, many students can't solve problems in time when they finish their homework. They can only stay in class to listen to teachers. explain. It is impossible to solve problems in a timely manner and solve them in time, which has greatly hampered the students' enthusiasm for studying the course.
- There are too few hardware courses offered. The difference between computer science and technology and software engineering is that the former focuses on hardware, while the latter only focuses on software. The hardware courses designed in this professional training program are only three principles of microcomputer principle, electronic circuit technology and digital logic, and they have very few class hours. So, what is the difference between computer science and technology engineering and software engineering? This will inevitably lead to the students' hardware and software will not be solid enough. In addition, some students who have a strong interest in computer hardware will be disappointed. In fact, there are generally many shortcomings in the majors and fewer classes.

The existence of the above drawbacks is actually related to the lack of understanding of the relationship between talent demand and professional construction. In view of the above two shortcomings, the following will analyze the talent training plan of the computer science and technology major from the three aspects of the unified relationship, the opposite relationship and the interactive relationship between talent demand and professional construction.

- Unified relationship. From the perspective of professionalism, professionalism is the academic category set by the higher education sector according to the needs of scientific division of labor and industrial structure. It is an important symbol for the professional cultivation of talents. One of the days of professional construction in colleges and universities is to cultivate professional talents of different levels according to the requirements of social occupations and relying on the advantages of disciplines. This means that the professional curriculum construction must take into account the future social requirements for the profession and the demand for talent. Paying attention to the cultivation of practical ability is a good embodiment of the above principles. It is worth mentioning that while paying attention to the cultivation of practical ability, we must not neglect the study of basic theory. It is important to note that theory and practice are mutually reinforcing and must be balanced.
- The opposite relationship. Professional construction not only meets the requirements of professional positions for professional knowledge and skills, but also meets the requirements of knowledge system transfer and scientific research to develop in depth. There is tension between the two. Professional construction must balance the relationship between the two and constantly adjust. In fact, there is a contradiction between the current professional construction mode, the adjustment mechanism and the marketization requirements for college students. There is no synchronicity between professional setting and employment of college students, but it is a contradiction between the hysteresis of professional setting and the immediacy of employment. To reflect this principle, the school's computer science and technology professional talent training program should pay attention to scientific research, and must also clarify the relationship between scientific research and traditional knowledge transfer.
- Interactive relationship. On the one hand, the employment situation directly affects the professional construction. The main purpose of modern people to receive higher education is to seek a better career and a higher social status. However, in the era of higher education popularization, the employment problem has increasingly become a bottleneck restricting the healthy development of higher education, and has become a negative factor affecting social harmony and stability. On the other hand, scientific professional construction can win the initiative for the employment of college students. The cultivation of applied talents is the embodiment of this principle. Contact the actual situation of computer science and technology in our school. The school will organize students to visit the company and conduct so-called training. However, merely visiting companies actually has little effect on the understanding of students' actual work in the future. What is more worth doing is that the world allows students to truly participate in the actual work, so that they will have a deep understanding.

For the above analysis, we give the following specific recommendations for school reference:

- Appropriately increase the hours of each course. The actual situation of this major is that there are many courses and too few classes. Too much free time is bound to lead to students' lazy thinking. This will have a very negative impact on the development of the entire profession. It is worth mentioning that in June this year, the party secretary and minister of the Ministry of Education, Chen Baosheng, mentioned for the first time that students should be reasonably “increased” , enhance the academic challenges of college students, and stimulate students' motivation and professional interest. Subsequent measures for the “increased burden” of colleges and universities have also been introduced.
- Re-implement the 72-hour schedule of the Computer Composition Principles course. The current composition of computer composition is 54 hours. From the perspective of postgraduate research or its importance to computers, the current hours are too few. This will directly lead to a lot of content being shallow or not. Such important content will not be a huge loss for students, and will inevitably affect students' understanding of computer composition, and the understanding of computers will accompany the student's entire career in the future. Therefore, it is necessary to add classes to the course.
- Put an end to "pseudo" practice. The practical content of this major should not only be a visual visit to the enterprise, the school should provide opportunities for students to experience the practical work in the learning stage, which can enhance the students' hands-on practical ability, and secondly, make the students work on the actual work. Have some understanding so that the direction of employment in the future will be more clear.
- Revise the training plan for this major. As mentioned above, the training program of this major is too simple and not specific enough. Consideration should be given to elaboration of the provisions. For example, the basic algorithms that students should master are listed in detail. In addition, the original training program lacks the rules for students to master professional norms and professional ethics. Professional norms and professional ethics are the occupations that everyone is engaged in.

Model Disadvantages

Requires time series data to be stable or stable after differentiation; essentially only capture linear relationships and not capture nonlinear relationships. Stationarity can be divided into two types: strict stability and weak stability. Strictness means that the distribution of data does not change with time; while weakly stationary means that the expectation and the number of relationships (ie, dependencies) of the data do not change. In the process of practical application, strict and stable is too idealized and theorized, and most cases should be weak and stable. For unstable data, we should smooth the data. The most common method is the difference method, which calculates the difference between time t and time t-1 in the time series, thus obtaining a new, more stable time series. Model improvement: For the parameters (p, d, q) in the ARIMA model (where p represents the autocorrelation censor, d represents the differential median, and q represents the partial autocorrelation censor), the error is large according to PACF and ACF. Python can be used to calculate the value of

AIC, so that each parameter can be accurately obtained, and the stationarity judgment is also a rough observation of the stationarity.

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