Discussion on Teaching Methods and Choice of Programming Language on Software Engineering Major

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ABSTRACT

With the development of computer technology, a variety of programming languages, especially the rapid development of software engineering, the choice of programming language and the reform of teaching methods are also more urgent. In order to meet the need of employment, choose the right programming language, at the same time, the theory teaching and practice teaching should be combined effectively, the teaching should keep pace with the times, so as to cultivate the excellent programming personnel.

AN OVERVIEW OF THE DEMAND ENVIRONMENT FOR SOFTWARE ENGINEERING MAJOR

Software industry is the core of the information industry, it is the basic and strategic emerging industries of the national economy and social development, and it is the key link of the information construction and the commanding heights of the international competition in twenty-first Century. The key to healthy and rapid development of software industry is talent training, but there are still a big gaps in the software engineering and technical personnel in our country and even in the whole world [1]. Therefore, do a good job of the software industry, the formation of a "springhead" with considerable scale and quality in the development and application of software professionals, especially to train a batch of complex software engineering with internationalization, innovation and engineering talents for the software industry continued to escort the healthy development is vital, and programming language is a software engineering professional core courses, so for the selection and teaching methods of programming language study is the priority among priorities.

MAINSTREAM PROGRAMMING LANGUAGE ANALYSIS AND SELECTION

In view of the current software engineering, we need to choose which programming language, want to grow as the top Coder need to choose which

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programming language? TIOBE December 2016 release of the programming language, Java no suspense to become the first. TIOBE programming language community list is an indicator of the popularity of programming languages, this list is ranked based on the number of experienced programmers, courses and third party vendors on the Internet. Ranking is from the famous search engine’s calculation. In the Top10 list (as shown in Fig. 1), Groovy at the end of 2015 there has been an explosive growth, so in January 2017 the growth rate may not be too fast. Google Go increased the fastest was 1.74%, of which Docker the container using Go language written in popularity is likely in the help of a force. The annual growth rate of other programming languages, such as Objective-C, Swift and R, is close to 1%. Another notable programming language is Python, its share in the continuing rise in the current ranking of fourth, Python easy to learn, but also with the use of Python can also be a full stack development. Now analyze the current mainstream of several programming languages.

**Figure 1. Programming language Top10 list.**

### Java

It is a very popular programming language, and easy to learn. Uses: it can be used for Android & IOS application development, video game development, desktop GUIs and software development. Advantage: the market demand for Java developers: Dice.com in May 2016 released the report pointed out that the development of Java software for post skill direction of the greatest demand at present; the development of language: the Java platform continues to usher in a new function, including the introduction of lambda mechanism; the foundation of Android application development: Android mobile platform is Google worldwide the most popular mobile platform at present. Developers can use their Java skills for the development and application of Android system. Disadvantages: the occupation of a large amount of memory: Java use of memory is higher than C++; the learning curve: does not belong to the most easy language, certainly not the most difficult language to learn; the start time is longer than any ever use Java language to develop the Android application friend will speed the simulator code slowly on the desktop to leave a deep impression.
C++

It is an object-oriented programming language, is widely regarded as the most outstanding large-scale application building language. C++ is a superset of the C language. Uses: it can be used for search engine, operating system, video game and software development. Advantages: to help you master the C/C++: talent shows itself to be able to help you in the development of many talent shows itself; master C/C++, you will be able to understand the memory management mechanism of Java or Python programming language, and to understand the problem of how to avoid all kinds of traps and common space; the flexible adjustment: C++ allows you to flexibly adjust my application and give full play to all performance computer. Compared with Java, C++ is not friendly, but we are able to use it to achieve all the operations. Disadvantages: difficult: the learning curve of C++ is very difficult to learn, but in the master after everyone will directly boarded the programmer in Pyramid Tacia. The very large size: C++ and have a large number of extremely complex interaction function. No developer is able to use all of the build components provided, but we can give full play to their talents for the program to select the right subset of features.

Python

It is a server-side interpretation of the open source scripting language. It can be used alone, and also be used as part of the framework of django. Uses: Web development, video game development, desktop GUIs and software development. Advantages: easy to learn: Python as the most easy to master programming language and has a high popularity; the Library: tools and features extensive library that can help you to easily complete the construction work; the Internet of things: Python with the popularization of networking technology and the further development of the Raspberry, Pi and other new platform has to be used as the basis for the development. Disadvantages: speed: as an explanatory language, its speed is often lower than the compiler language; mobile: Python performance in the field of mobile computing is relatively poor. The use of mobile Python application development is very rare; the Python language design: there are some problems in the design, which belongs to the dynamic type of language, it is necessary to perform more tests and bring some errors appeared in specific runtime [2].

Figure 2. Programming language Top10 trend chart.
C#

It is a powerful and flexible programming language. As with other programming languages, it can also be used to create a variety of applications. In fact, the function of C# is limited by our imagination. The language does not have any restrictions on the operation of the developer, which can be used to deliver dynamic web sites, development tools, and even the compiler, etc. Applications: Windows applications, enterprise class business applications and software development. Advantage: the.Net Library: a fully integrated .Net library, provide excellent function and support library access. The transformation: based on the C language, so the structure of C# can be transferred to Java, Objective-C, PHP, C++ and other forms of language. The demand: C# plus Java for the enterprises to demand the most strong software development skills combination. The disadvantage is not suitable for a novice: C# is not the most suitable for beginners of learning programming language, the learning curve is very steep. The cross platform ability: due to the integration of .Net, and therefore do not have the ability of cross platform [3].

THINKING ON TEACHING METHODS OF PROGRAMMING LANGUAGE

For computer software major, I have some experience in the teaching of programming language.

Theoretical Teaching and Practical teaching Should Be Combined Effectively

According to the characteristics and basis of students, to cultivate the thinking ability and application ability, increase the acceptability of the target, break through the tradition, innovation, popularization, using case teaching method diversification of popularization, and formed a "case" driven by the knowledge point and go through the whole teaching process. Specifically, in the process of teaching programming language, first by the teacher will be a class or several class related content together to write one or several vivid examples of procedures. Before teaching the corresponding content, give the students a demonstration example, cause their learning interest, and then teach the corresponding knowledge point. Combined with the teaching of computer language can introduce some typical problems. In the teaching of the corresponding solutions, can be combined with before students learned the related knowledge of the course, such as the linked list data structure, a special matrix, sorting, so that students in learning a programming language at the same time, the former course one, so as to stimulate students' interest in learning, exercise ability, use proficient in the language, improve programming skills.

Adopt a Variety of Test Methods

The examination content should reflect the basic theory and the basic skills of students, as well as the analysis and solution of the problem of the comprehensive ability to use, rather than a simple repetition of the content of the classroom teaching. To consciously cultivate students' sense of innovation and innovation ability, so that students can really test the students' knowledge, ability and quality.
of a comprehensive test and evaluation, so as to promote the students' learning. Final exam results from the theory of 30 points, 30 points on the computer test, the experiment 30 points, usually four points 10 parts. Theoretical examination at the end of the period, the volume out of 100 points, the calculation of the total score by 30%. Taking into account the examination coverage is limited, and in order to highlight the importance of practical ability in learning, assessment for the experiment results, we can continue to keep 10 programming problems to the students in the classroom, students can choose 5 questions, namely: do leave, finish the teacher check. The students through the presentation and to the question of the teacher's answer to judge whether the student can independently complete, quality, understanding of corresponding knowledge points, to 6 points for each question by the teacher scores given, finally calculated the 5 questions as the experimental results of the students' scores. For the usual results, considering the normal situation of the students are given[4]. This test method can not only comprehensively investigate the students to grasp the knowledge, but also highlights the focus, but also can effectively improve the students' ability to work.

Teaching Should Advance with the Times

In the latest teachers should understand the development of software industry and some emerging occupation, the introduction of relevant content to the students. For example, China's software outsourcing service market after several years of development, the scale of rapid growth, the strength significantly enhanced, in the international market is also more and more high visibility. China Software Industry Association believes that on the one hand, Europe and other countries to avoid risks and reduce the cost, begin to take some projects to Chinese transfer; on the other hand, the domestic software outsourcing service providers in recent years began to expand to foreign countries, and through acquisitions, set up branches and other strategies of "going out", in this the industry is especially active venture capitalists will develop service outsourcing and increase the driving force, has become an important goal of the recent listing of many main software and service outsourcing service providers.

CONCLUSION

In the teaching process, in order to effectively join the employment related to the forefront of information, improve the initiative and purpose to study students, enhance their confidence in future employment, so that they recognize in the computer industry is a promising development.

In addition, the country is now vigorously promote labor access system and occupation qualification certificate system, which means our students to quickly after graduation employment, must before graduation after the occupation training, and get the occupation qualification certificate. As teachers, we should take corresponding examination certificate, in the meanwhile, in-depth and detailed understanding of related qualification examination of the contents, so as to reform the classroom teaching, targeted to strengthen practice and training, strengthen the occupation skill certification training, closely linked with the people first line.
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