Training for an Interview

Dov Kruger

# Introduction

Many of you have learned C++, Java or Data structures with me, and have asked what else you can do to prepare for a job interview. The following checklist will give you a number of areas in which to train, and specific resources to help you get there.

Here is a link to my resume as an example. This one is a commercial resume, not the CV for academic jobs:

It is by far better to learn one thing well than two things in a mediocre way. So don’t try to learn everything in all languages, pick one and try to master that first. In other words, of all the topics below, pick either C++ or Java and try to work on your skills, don’t try to work on both at the same time. However, for all the libraries and associated technologies, broad is better. In other words, you should try to learn to do as many of these things in each language as possible. It is much better to at least install MySQL, play around with creating tables, and the four operations (insert, delete, update, select) than to never have done it at all. And it is far better to do that and write a program in C++ or Java that interacts with the database. You don’t have to be an expert with databases, the difference between something and nothing in that regard is huge. To summarize, if you have not taken a database course, then quickly load MySQL, learn the basics from an SQL tutorial (create a table, and practice the 4 basic operations: INSERT, UPDATE, DELETE, SELECT). Then if you are a java programmer, get a tutorial on JDBC and write a program to read from the database and display the results on screen.

Java is not as big of a language as C++, but there are libraries to learn. C++ has far more subtlety, and many more language issues, and there are also the STL libraries.

You do not have to know everything to get an interview. But the more you know, the more likely you will succeed in an interview. Try to study these materials well before you look for jobs. Practice with each key technology so you can say you have. Write a few sample programs that interact with the database. As you master each topic, put it on your resume. In a few months of studying, you can make yourself far more marketable.

# Preparing your Resume

A resume for programming must be quite specific. Unfortunately, in the current job environment, there will often be hundreds of resumes vying for jobs, and recruiters might use automated tools to weed through them. At the very least, assume that a recruiter will give your resume only a couple of seconds before tossing it in the garbage. Worse, if they use an automated system, then if your resume does not contain the right keyword, no human will even see your resume. Recruiters are typically fairly ignorant of technology. They are simply told that they need a certain set of skills, and if they don’t see the right keywords your resume is tossed. Therefore, you need to list all your skills prominently toward the top, with all the keywords listed. Do not list anything you have not studied, and if you put it on your resume, study it again before going into the interview. However, you don’t have to limit your resume to subjects you have lots of experience in; that’s why you study the topics below, so you can credibly show some familiarity on the interview, without pretending that you are an expert in all these subjects.

# Tips on listing Special Skills

I recommend that your resume have a set of categories up front, just below your education. The following is a sample. Note the duplication of terms: Linux (and then variants known), and Office (and then Word, Excel, Powerpoint). This is because an employer looking for specific skills might look for a keyword. If you see a job spec that says “required skills” make a version of your resume with all those required skills. Leaving off one might result in your resume being automatically culled.

Programming Languages: C++, Java, Perl, x86 assembler, Octave, Matlab, R, FORTRAN

Tools: eclipse, emacs, sublime text, Qt, vi, notepad++, svn, cvs

Graphical API: Processing, Java swing, OpenGL

Databases: MySQL, Oracle, Sybase, MS-SQL Server, MongoDB

Web: HTML, CSS, Javascript, AJAX, XML, jQuery, Apache, Tomcat7, servlets/JSP, ASP

Middleware: CORBA, SOAP

Operating Systems: Windows XP, Vista, 7, 8, Mac OSX, Linux (Ubuntu, Red Hat, Fedora, Suse)

Version control: git, mercurial, svn, cvs, github, bitbucket

Productivity: Office (Word, Excel, Powerpoint, Access), gimp, google docs, LaTeX

Special Skills: written and spoken Hebrew, French, and rudimentary Japanese. American Sailing Association instructor qualified through bareboat and celestial navigation.

The following resources are good for practicing for jobs.

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| Site | Description |
| <https://leetcode.com/> | A set of problems to work on to hone your programming skills in many areas. Specifically designed for interview skills. |
| <https://projecteuler.net> | A set of math/algorithm problems. This is good preparation for jobs that require mathematics and algorithms, but it is fairly narrow in scope. |
| <http://www.learncpp.com/cpp-tutorial/b-1-introduction-to-c11/> | A C++11 tutorial. It would be good to learn all the new language features. |
| <http://docs.oracle.com/javase/tutorial/essential/concurrency/> | Multithreaded code is important, and this tutorial covers all the major issues, |
| <https://solarianprogrammer.com/2011/12/16/cpp-11-thread-tutorial/> | Similar threading and mutex tutorial for C++11 but this was early so some of the specifics about compilers are out of date. |
| <https://dev.mysql.com/doc/refman/5.0/en/tutorial.html> | MySQL tutorial. |
| <http://docs.oracle.com/javase/tutorial/jdbc/> | Tutorial on how to connect Java to a database. |
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| <http://www.w3schools.com/html/> | HTML tutorial. A large percentage of jobs are web-based so make sure you know html, css, and enough javascript to manipulate the Document Object Model (DOM). |
| <http://www.w3schools.com/css/> | CSS tutorial |
| <http://www.w3schools.com/js/default.asp> | Javascript tutorial |
| <https://docs.mongodb.org/getting-started/shell/> | MongoDB, a non-relational database. NOSQL is very popular right now. |
| <http://www.regular-expressions.info/tutorial.html> | Regular expressions, extremely useful for text processing |