

Student Project Ideas

1. **Merging XML databases.** The aim is to merge XML databases that may have duplicate records that match in some non-exact way. For example, one database might contain the email address david@cs.cardiff.ac.uk and another the address david@cs.cf.ac.uk. These two records should be seen as the same and merged.

You will need to be good at Java programming, and it would be an advantage if you know something about XML.

2. **Parallel applications using MPI.** The aim is to develop working versions in Java of some, or all, of the parallel programming examples used in the [Parallel Processing](#) module (CM0323). The mpiJava version of MPI will be used.

You should be a third-year BSc student taking the Parallel Processing module, although in exceptional circumstances MSc students may be allowed to select this project. You should be good at Java programming. Since some of these applications are available in C it might also be useful if you are familiar with C.

3. **Logic circuit builder.** The aim is to develop a software environment for building computer logic circuits from simpler circuits. At the lowest level the simplest circuits are NAND, NOR, NOT, AND, OR, and XOR gates. The environment must include a graphical user interface allowing circuits to be dragged, dropped, and connected to build more complex circuits. These circuits can then be stored and subsequently used to build yet more complex circuits. The environment should also be able to generate truth tables for circuits that are constructed.

You will need to understand Boolean logic, truth tables, and have a good grasp of Java programming.

4. **Email harvester.** The aim of this project is to develop a web crawler program that will examine web pages at a list of websites to extract email addresses that satisfy certain pattern matching conditions, and to store these email addresses in a database (such as an XML file).

You will need to have a good understanding of Perl.

5. **JACAW test suite.** The [Java-C automatic wrapper](#) (JACAW) software creates all the files necessary to allow a C routine to be called from a Java application through the Java Native Interface (JNI). The aim of this project is to develop a test suite based on the LAPACK package that automatically installs the JACAW software and tests that it is working correctly.

You will need to have experience with Java, and some knowledge of C programming.

6. **Java MPI binding using JACAW.** The [Java-C automatic wrapper](#) (JACAW) software creates all the files necessary to allow a C routine to be called from a Java application through the Java Native Interface (JNI). [MPI](#) is a message passing system using in parallel computing. The aim of this project is to develop a Java version of MPI using the JACAW software.

You will need to have experience with Java, and some knowledge of C programming.

7. **Web interface for JACAW.** The [Java-C automatic wrapper](#) (JACAW) software creates all the files necessary to allow a C routine to be called from a Java application through the Java Native Interface (JNI). The aim of this project is to develop a web browser interface to allow people to upload their C header files, to process them using JACAW, and to return the resulting files to the user.

You will need to have experience with Java, and some knowledge of C programming.