CS 4400 DATABASE PROJECT
Spring Semester 2008

January 31, 2008 (version 1.1)
PURPOSE OF PROJECT

Analyze, specify, design, implement and demonstrate an information system to support the operation of the Career Service System. The database and the application must be implemented using ORACLE available on ACME. Alternative implementations must be approved by the professor.

PROJECT PHASES

The three phases of the project cover the following tasks. Specific deliverables will be defined for each of the three phases.

PHASE	DESCRIPTION	DUE DATE
I	Analysis & Specification	15-Feb (Friday)
II	Design	14-Mar (Friday)
III	Implementation & Testing	21-Apr (Monday)
	Demonstration	April 22-25

Note: Each group can submit the project on the DUE DATE either in Prof. Omiecinski's classes , or to the T.A. at CoC commons during the TA office hour. As a backup, submit to secretary Deborah in 3042 Klaus building (404-385-2892).

GROUPS: Each group must have 3 or 4 members.

As a group, you will decide whether to complete the lightweight or heavyweight project options. The two options are identical for phases I and II, but differ in the deliverable for phase III. Note that the option of whether you wish to do heavy or light weight can wait until you get into phase III and as late as the final submission of Phase III.

Heavyweight Option
Groups choosing this option will demo a working implementation of their project to the TA. The implementation must include a Java or web-based GUI (Graphical User Interface) that uses JDBC (Java Database Connectivity) or ODBC (Open Database Connectivity) for database access. The SQL statements you create in phase II will be embedded inside your GUI.

Lightweight Option

Groups choosing the lightweight option will submit working SQL statements for each of the project tasks and demo the SQL statements to the TA. This option may be appealing to groups with little or no experience programming GUIs.

Oracle

We will provide you with access to the Oracle Database Management System on ACME. See the course webpage for further information on how to access Oracle from the ACME command line or from a Java program.

DELIVERABLES FOR EACH PHASE

Phase I:

- List of group members (mark clearly on the title page in alphabetical order by Last Name, include section and email of each member),
- Information Flow Diagram,
- E-R Diagram,
- Task Decomposition (where appropriate)
- Additional note, if necessary, about any assumptions

Useful Link for Phase I:
http://www.cc.gatech.edu/classes/AY2007/cs4400_spring/methodologyFall2002.ppt

Phase II:

- List of continuing group members (alphabetical order by Last Name, mention section and email of each member),
- Please also write down name of the TA who graded your project in phase I,
- Copy of the E-R Diagram from phase I (with any revisions),
- Copy of the Information Flow Diagram from phase I (with any revisions),
- Relational Schema Diagram (with primary and foreign keys identified, referential integrity is shown by arrows),
- Create Table statements, including domain constraints, integrity constraints, primary keys, and foreign keys,
- SQL statements for each task

Phase III:

- Copy of the Create Table statements from phase II (with any revisions),
- Contents of each Table in your Database,
- Source Code (documented) for your System,
- A set of working SQL statements for all project tasks *(Lightweight Option)*
- A functional GUI with embedded SQL statements that accesses your database *(Heavyweight Option)*
- A system demo to one of the TAs (use SQLPLUS if you choose the light

weight option)

GRADING:

The project will consist of 3 phases (deliverables) as well as a final demonstration to the TA. Phase I and Phase II of the project are each worth 10% credit (of your total grade for this class). Credit for phase III depends on the implementation option you choose.
Heavyweight Option - 20% credit: We will use the embedded SQL feature of ORACLE, called JDBC (A Sun Standard for Java Data Base Connectivity), which allows us to embed SQL statements in a Java program.
Lightweight Option - 5% credit: We will use the SQLPLUS feature of ORACLE, which allows us to execute stand-alone SQL statements.

PROJECT DESCRIPTION

Georgia Tech Career Service System (GTCareer)

Introduction
GTCareer is a system that is used to help employers meet employees. The system has two types of users: Administrator and Customers. The administrator's main task is to take care of the overall usage reports (for example, the number of applications in each month). A new customer has to register with a unique email address (which will be used as his/her username). There are two types of customers: Recruiters and Applicants. A recruiter can post, update, and delete jobs, and search for applicants with specific qualifications. An applicant can update his own profile, search for jobs, and apply for jobs.

The regular job searching process goes as follows. A recruiter (call him Richard) starts the process by posting a new job along with some details. He also has to specify the number of positions needed and what kind of test is required for this job. After it is posted, this job will be seen and can be searched by applicants. Suppose an applicant (call her Alice) decides to apply for this job. This job will be shown on her main page with status "in test process." She can always log into the system and check the status of this job.

When Richard later checks the list of applicants on his main page, he will see Alice's name on the list. After giving Alice a test (which is done outside the system), Richard will put Alice's score into the system and decide to either *advance* her to the interview process or *decline* her. Alice will now see her new application status on her main page ("declined" or "in interview process").

The interview process will be done outside the system. Once done, Richard can come back to the system and either decline or advance Alice. Again, Alice can check her application status on her main page (“declined” or “accepted”).

Once the number of accepted applicants of this job reaches the specified number of positions, the job will be automatically closed by the system and all applicants that are still in process (not yet declined or accepted) will be automatically declined.

Sometimes, the process might be slightly different. For example, a job might not need a test. In this case, an applicant who applies will be automatically in the interview process.

Functionality descriptions

Note that all figures are used for guidance only. Students are encouraged to design their own user interface. However, the information displayed in the GUI you design should be the same.

User main page is shown in figure 1. From here, a user can either access the applicant or recruiter's login page (figure A1 and B1) by clicking two buttons in figure 1.

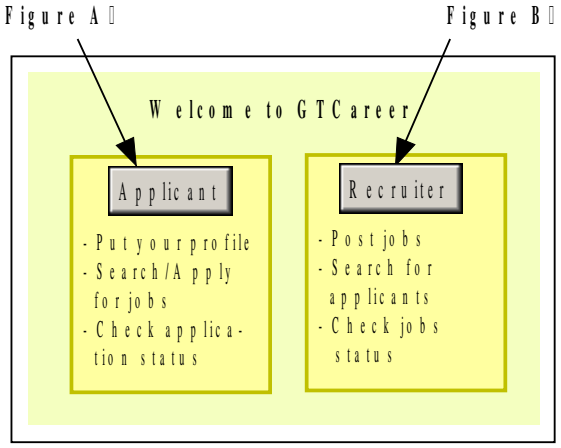

Figure 1

Applicant:

An applicant will be first shown the sign in page. If he/she has not signed up, he/she can do so by clicking on the sign up link at the bottom of the page. (Henceforth, we refer to the applicant as "he" for convenience).

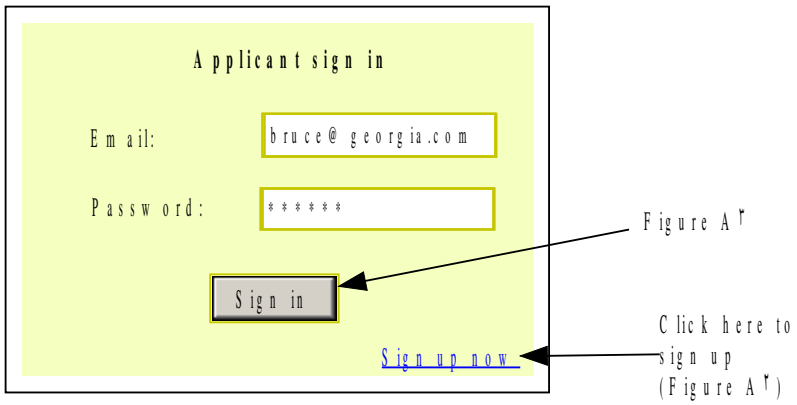

Figure A1

On the sign up page, an applicant can also put his profile, which he can update later (see figure A2). The lists of highest degree and Citizenship are shortened for the sake of simplicity. When an applicant signs up, he will be assigned a unique applicant ID which

will be used to optimize the system (the reason will be seen in phase 2-3 of this project). This number will be kept only in the system (even an applicant does not know his ID).

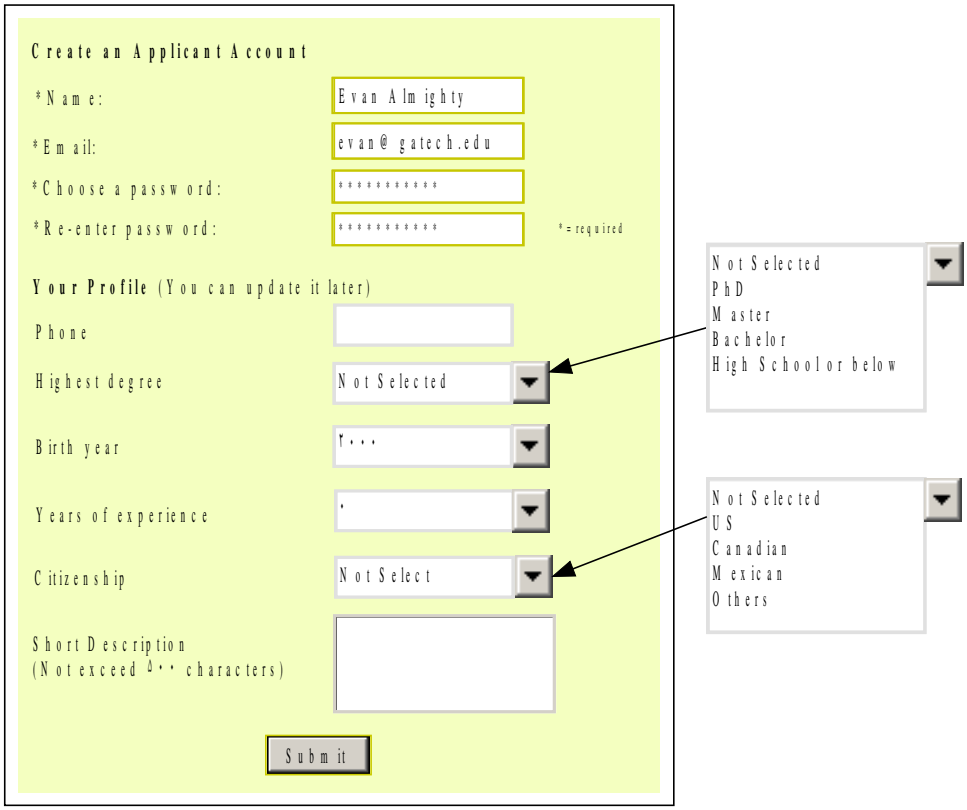

Figure A2

If the applicant has already signed up and enters the correct user name and password, the Applicant Main Page will be displayed. The Applicant main page consists of three tabs. Any of these three tabs can be selected by a user. See figure A3, A7, and A9. The first tab is job search.

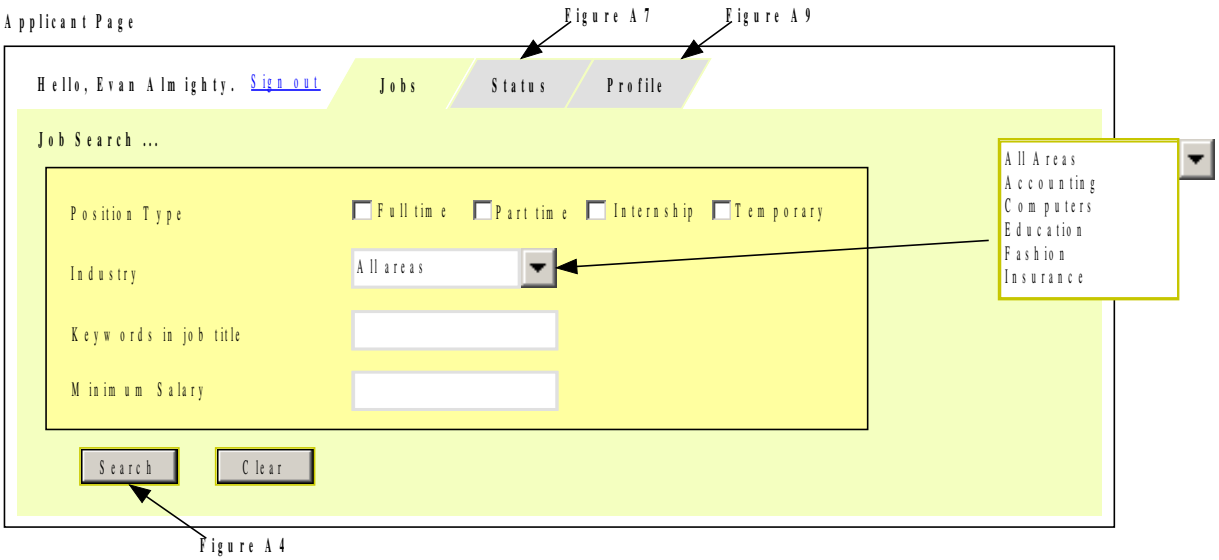

Figure A3

Jobs can be searched by specifying position types, industry, key words, and minimum salary. There are four position types: full time, part time, internship, and temporary. For simplicity, we assume there are only five industries: Accounting, Computers, Education, Fashion, and Insurance. If keywords are inserted, only jobs with such words in their title will be shown.

Note that many words, separated by space, may be entered. To avoid complications, we assume that the system will show only job titles that contain these words *in order* (but not necessary consecutive). For example, if "manager assistant" is entered, jobs with titles "Project Manager Assistant" and "Manager Secondary Assistant" will be shown but "Assistant Manager" will *not* be shown.

After the search button is pressed, search results will appear:

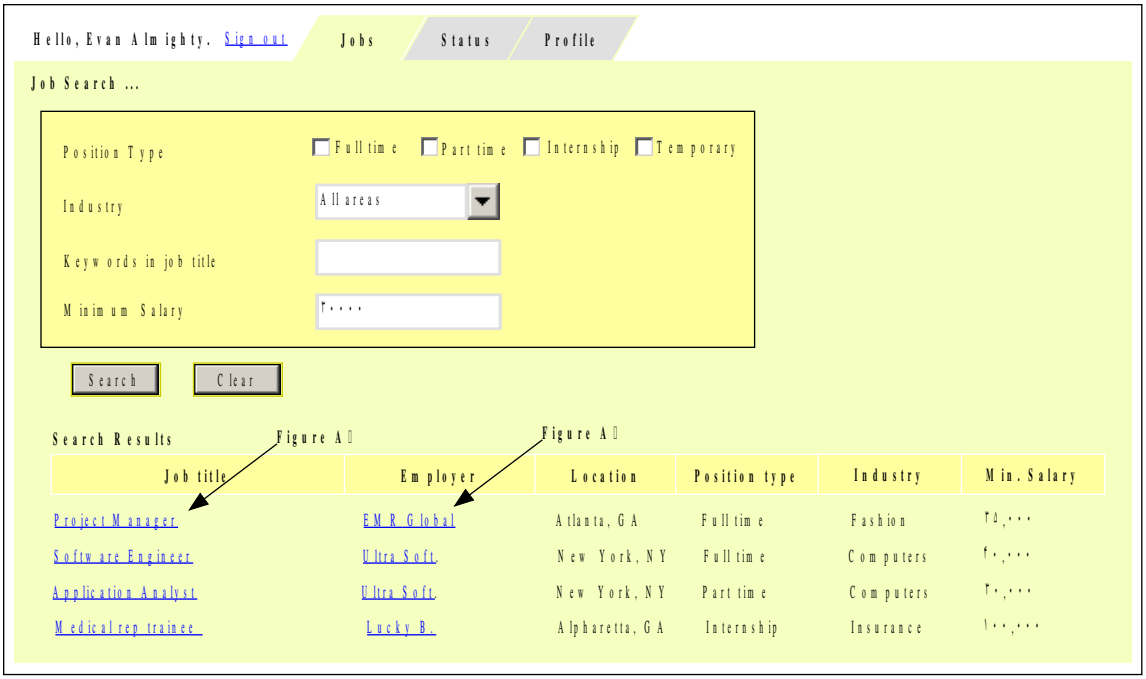

Figure A4

From this page, a user can click on a job title to check its detail (figure A5) and on a company name to check company's detail (figure A6).

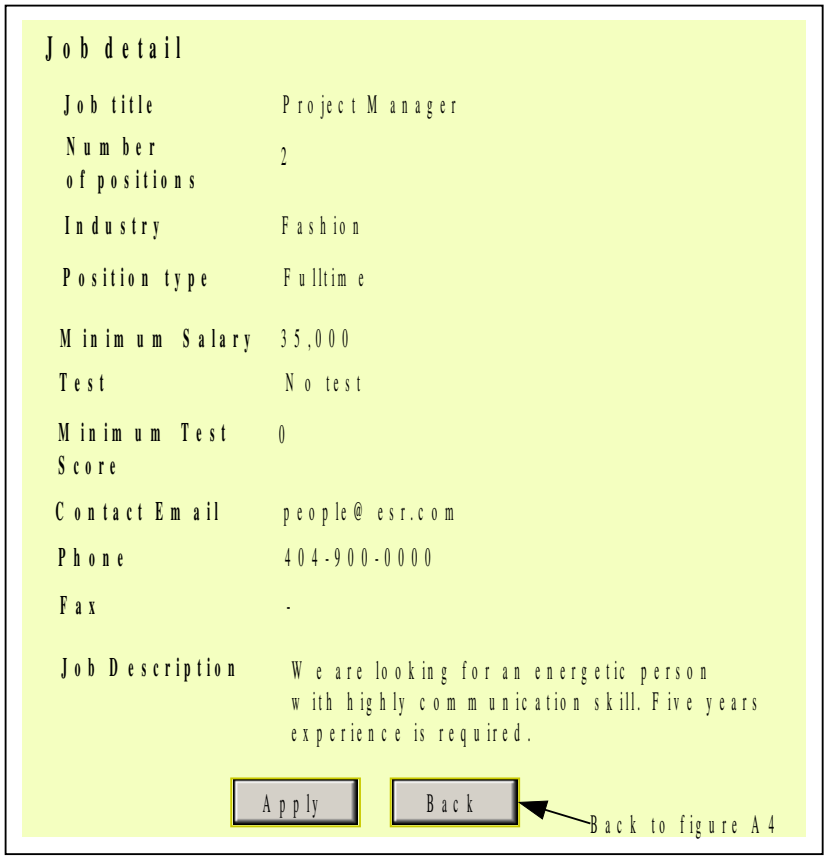

Figure A5

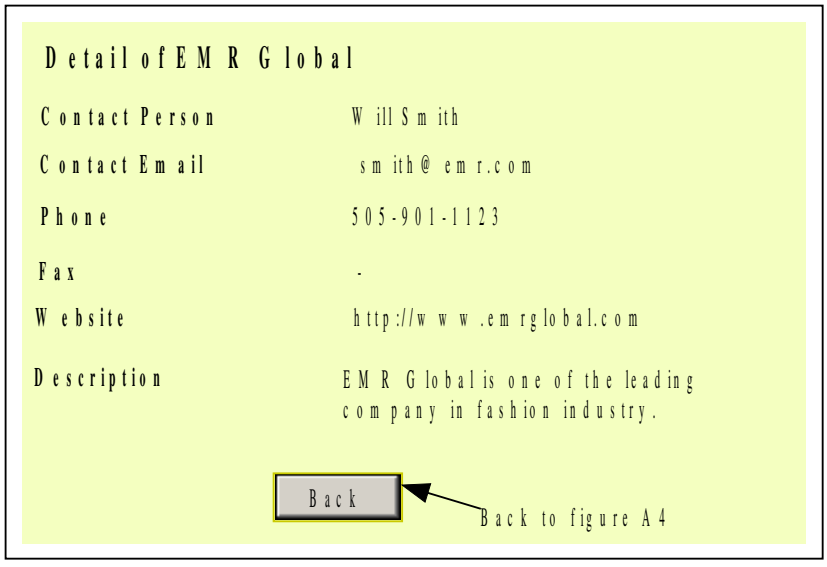

Figure A6

The second tab is the status tab where an applicant can check statuses of jobs he has applied. There are 5 statuses: In test process (an applicant has not taken the required test or the test result has not been announced), in interview process, in decision process,

declined, and accepted. The user can choose to show all jobs or only jobs that are in process (not accepted or declined). See figure A7 and A8.

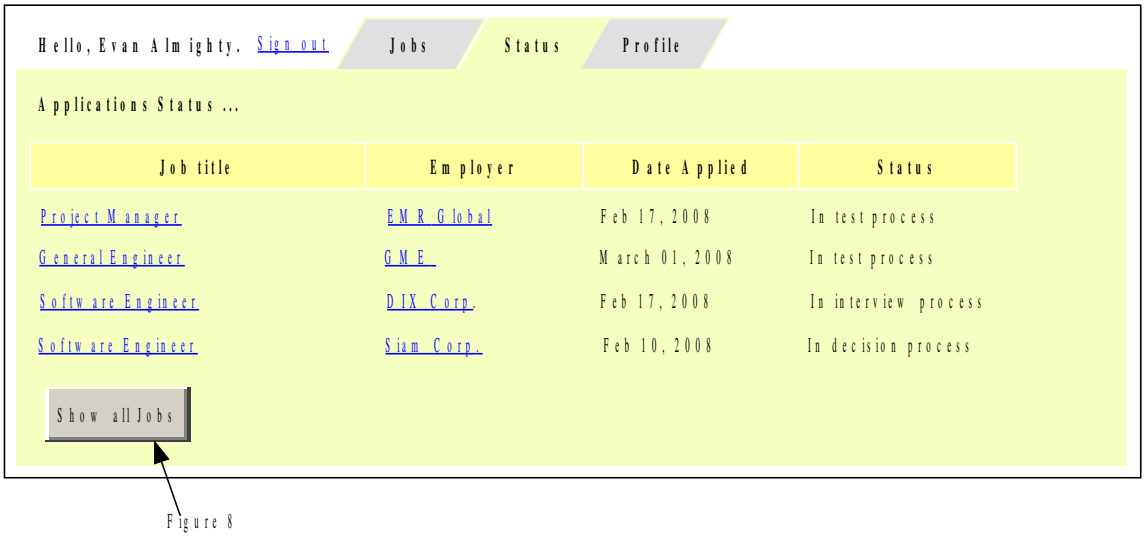

Figure A7

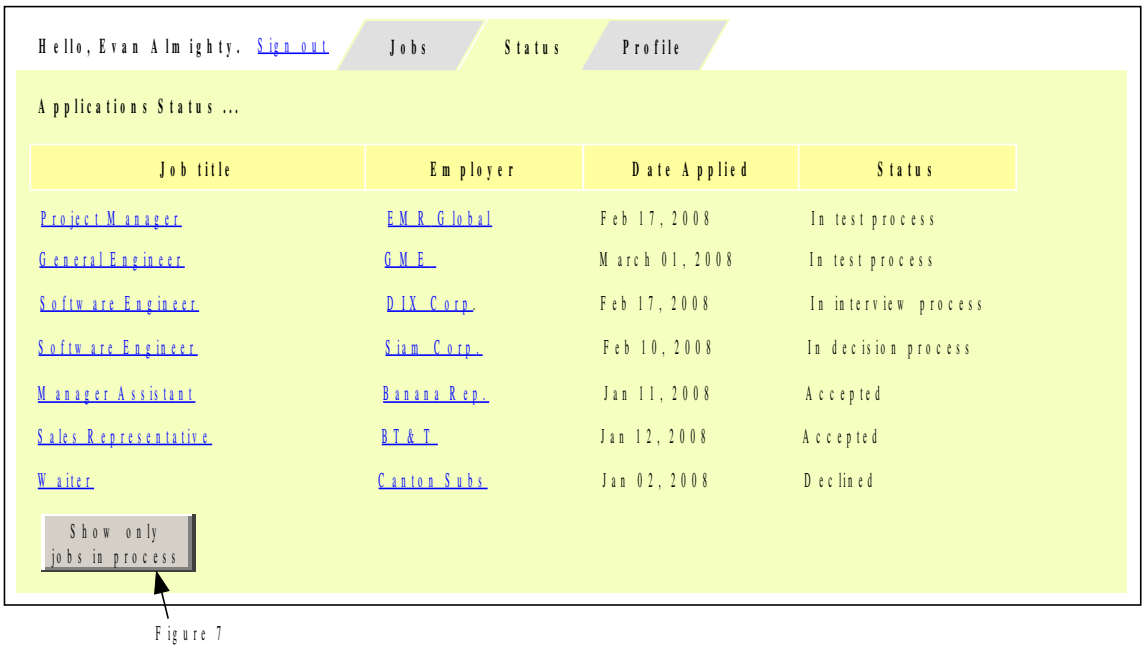

Figure A8

The last tab is the profile tab where the applicant can update his profile. When he clicks this tab he will see his old information and he can make any change. The data will be updated when he clicks the “submit” button.

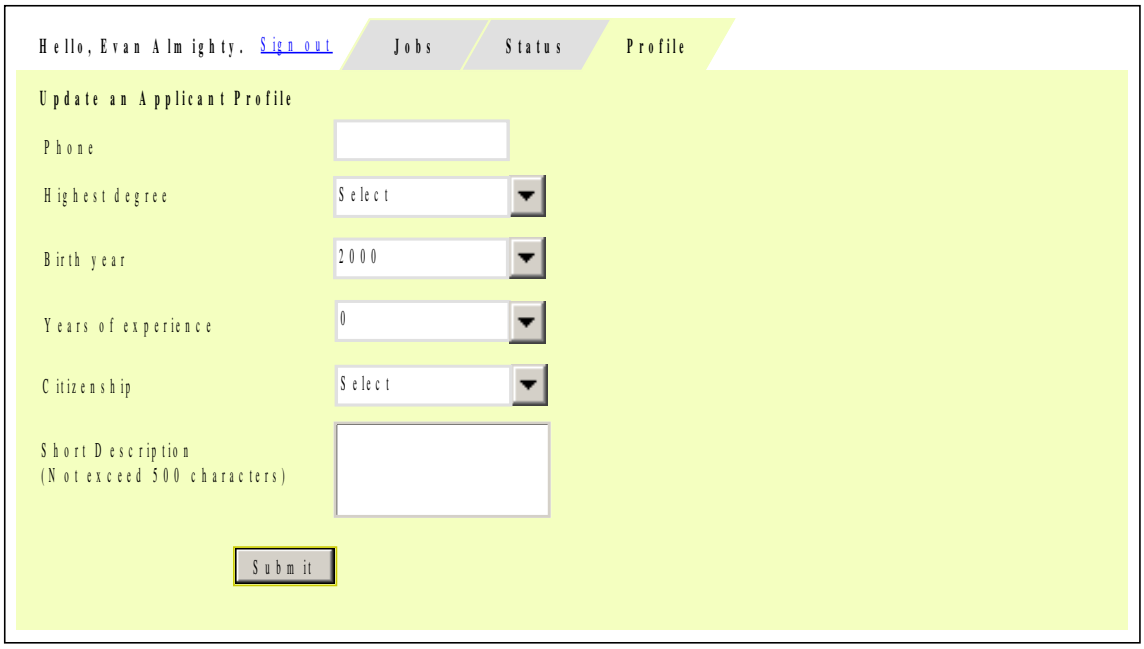

Figure A9

Recruiter

A recruiter will be first shown the sign in page (figure B1). If he has not signed up, he can do so by clicking on the sign up link at the bottom of the page (figure B2).

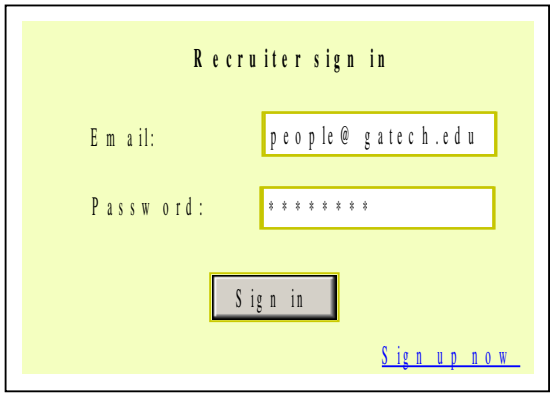

Figure B1

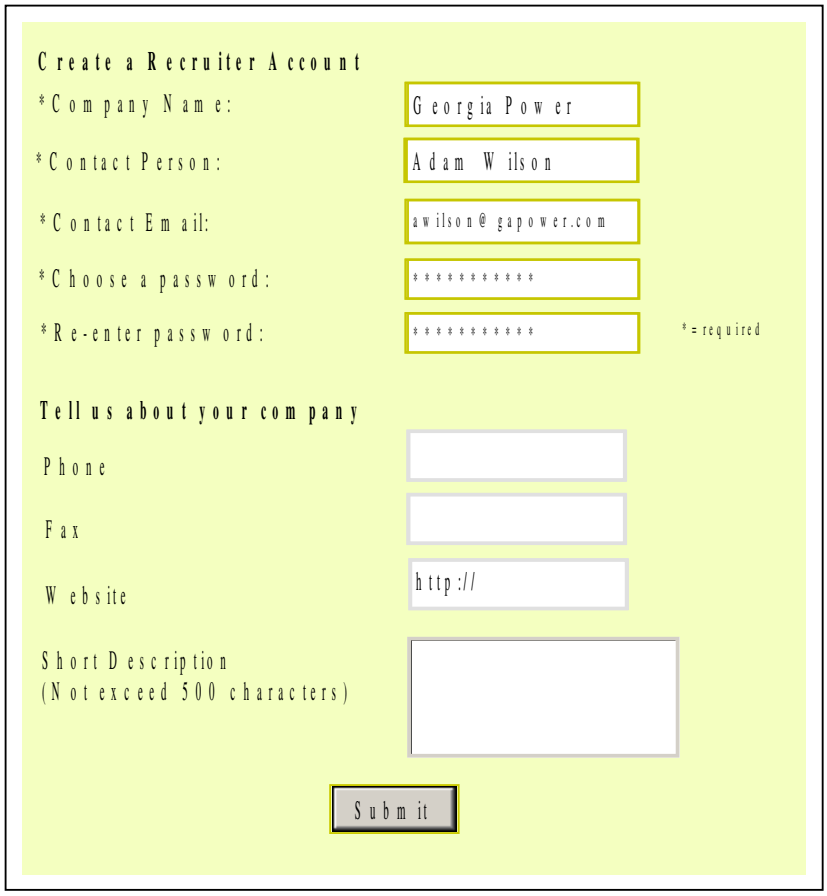

Figure B2

After signing in, the recruiter main page will be shown as in figure B3. If the "Close jobs" button is clicked, the selected jobs will be closed. That is, all applicants in the process of these jobs will be automatically declined and these jobs will not be shown in any list. Note that for research purposes (statistical analysis), we will *not* actually delete these jobs from the database.

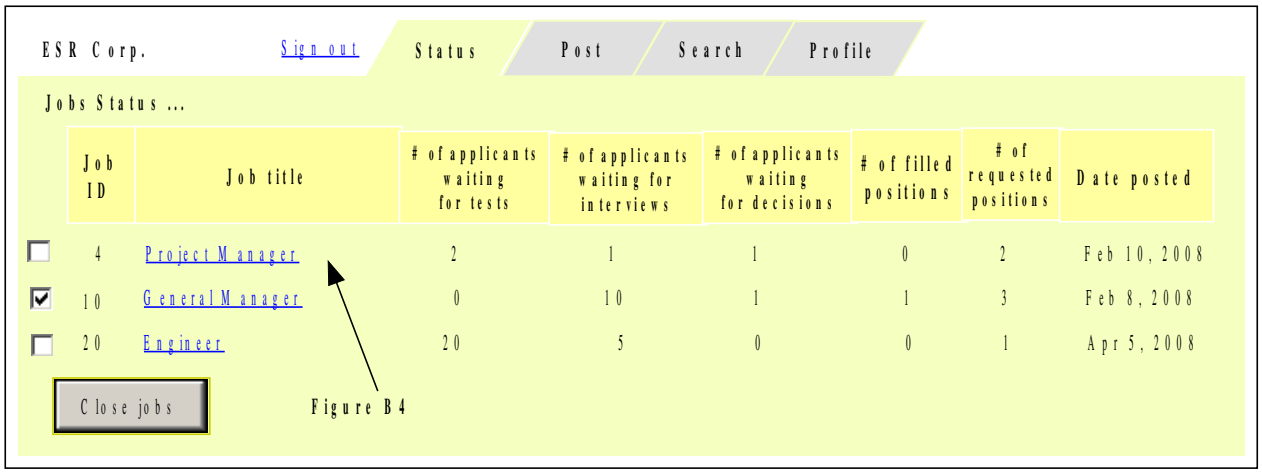

Figure B3

If the job title is selected, job update page will be shown (see figure B4). Applicant IDs (which is generated by the system when applicants signed up) are shown to avoid confusion.

If an applicant's name is clicked, his profile will be shown (figure B8).

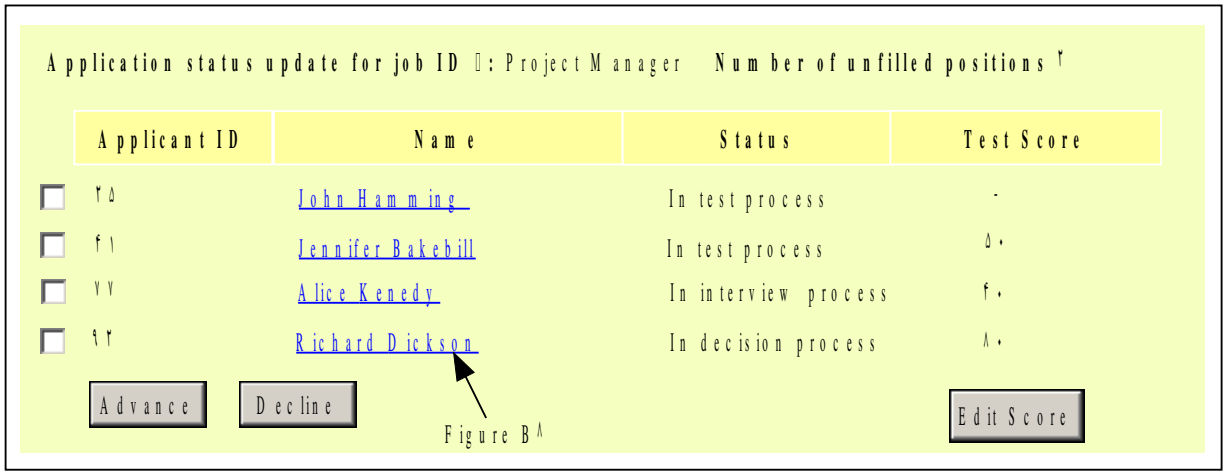

Figure B4

Advancing selected applicants to the next process (i.e., advance an applicant from the "test process" to the "interview process" and from the "interview process" to the "accepted" state) can be done by clicking "advance" button. On the other hand, the selected applicants will be declined if "decline" button is clicked.

The system must warn the user if he accepts too many people (so that there are more accepted applicants than the number of positions). Moreover, when the number of accepted applicants is exactly the number of positions, the system will automatically decline the remaining applicants and close the job.

Applicants' test scores can be added or updated by clicking "Edit Score" button. Note that the recruiter can advance any applicant, *even if his score is not entered*. (We use minimum score only as a guideline.)

Figure B5

The second tab is the "post" tab where the recruiter can post new jobs. Note that when the user clicks the "submit" button, job ID and post date (which is used in figure B3) will be obtained by the system automatically.

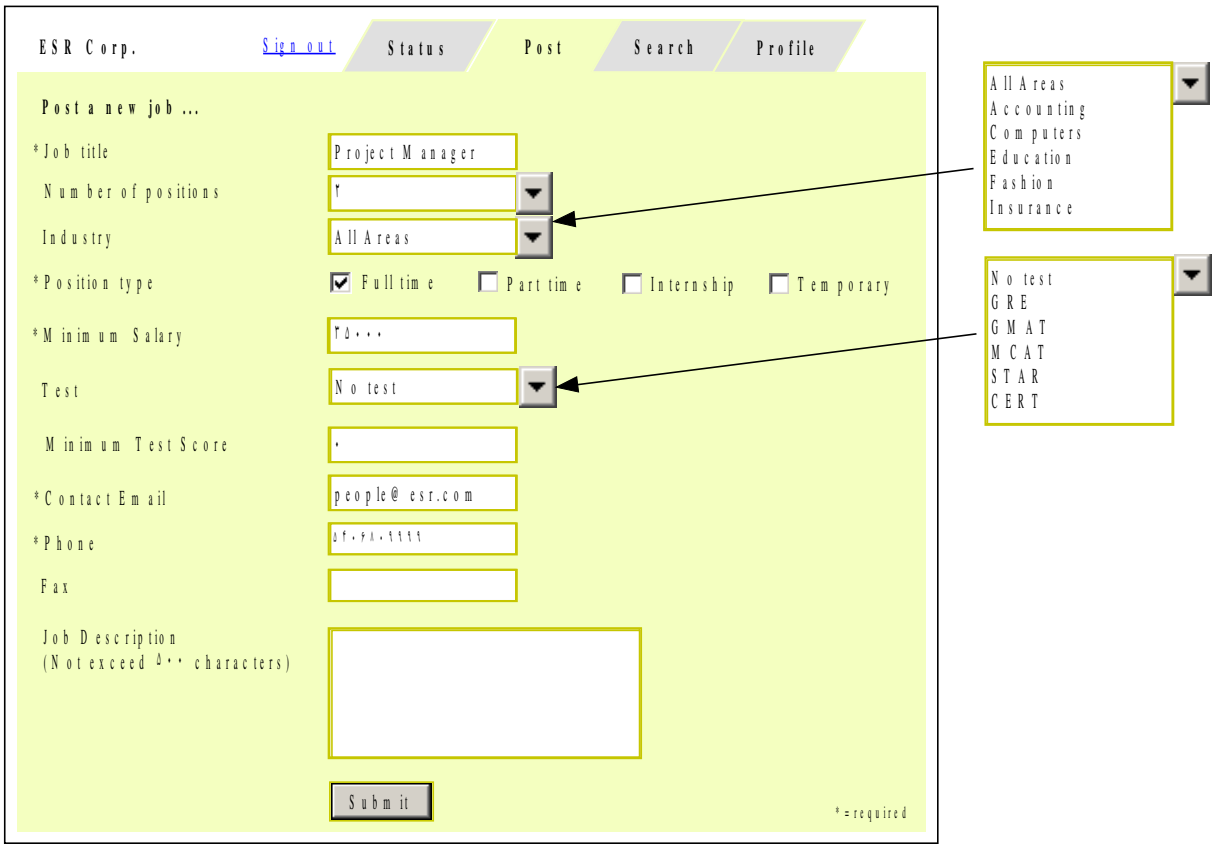

Figure B6

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The third tab is the "search" tab where the user can search for applicants with specified qualities. Any combination of parameters shown in Figure B7 (e.g. Degree = "B.S." and Experience > 5) may be provided for search. All parameters may not necessarily be provided; e.g., just giving Experience >10 will retrieve all applicants with over 10 years of experience.

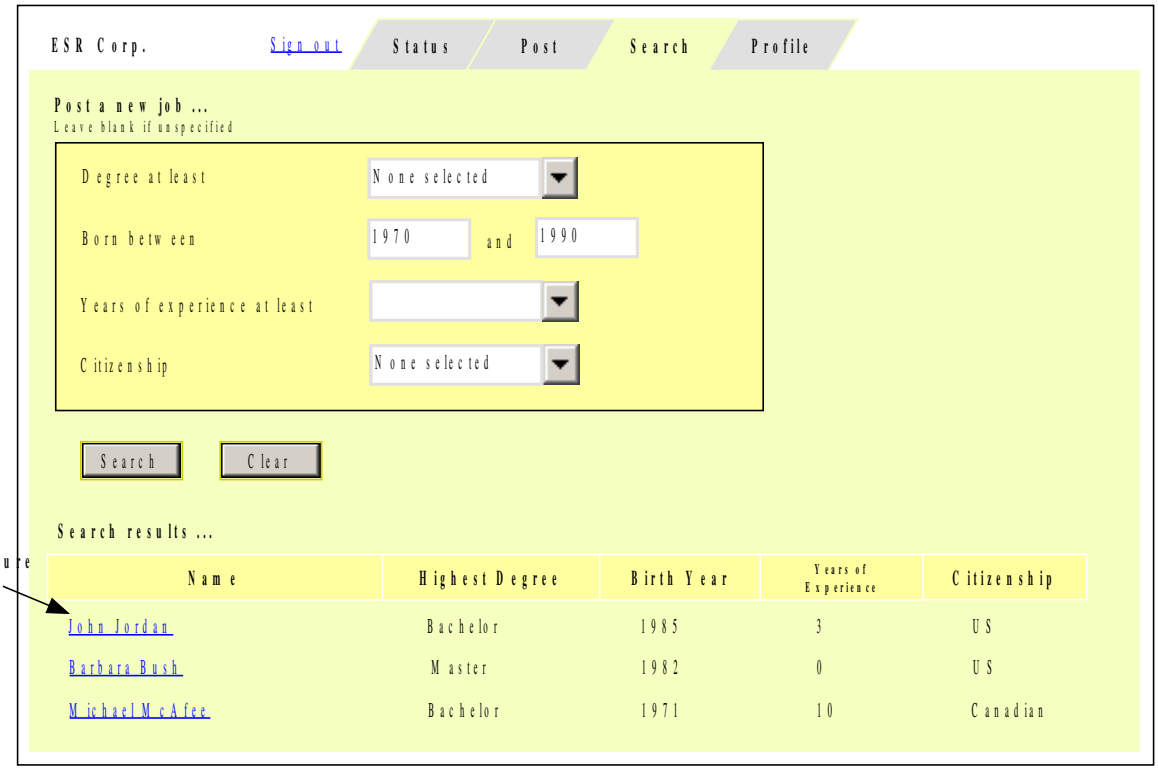


Figure B8

Figure B7

If an applicant's name is clicked, his detail page will be shown:

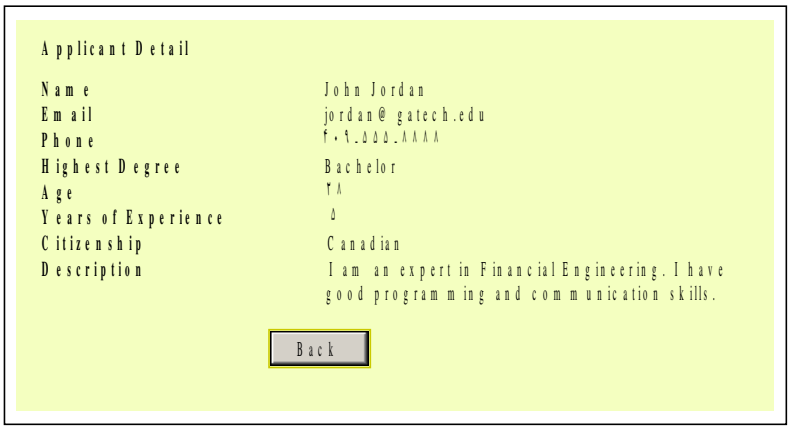


Figure B8

The last tab is the profile tab where he can update the company's profile. The Company's old profile will be shown and the recruiter can make any changes. The data will be updated when it is submitted.

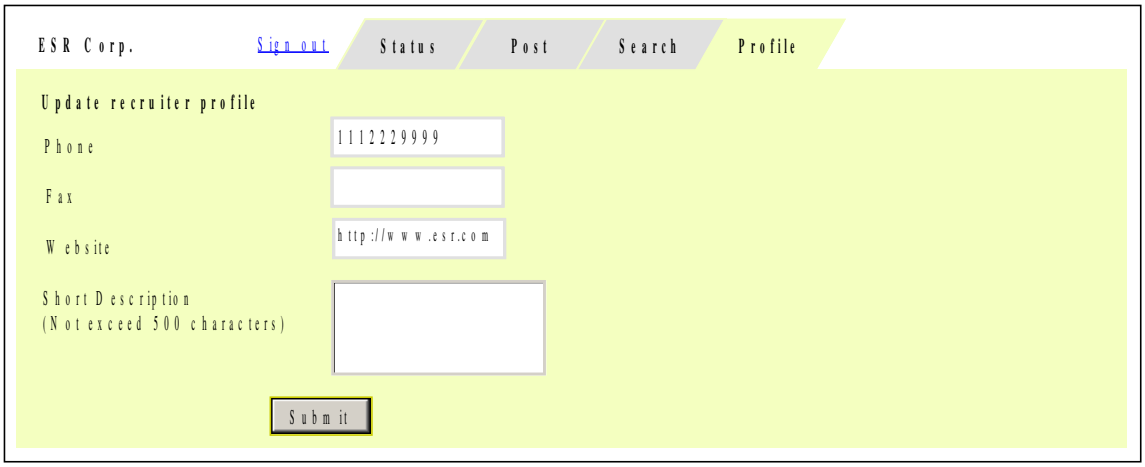


Figure B9

Administrator

An administrator will sign in using a separate page.

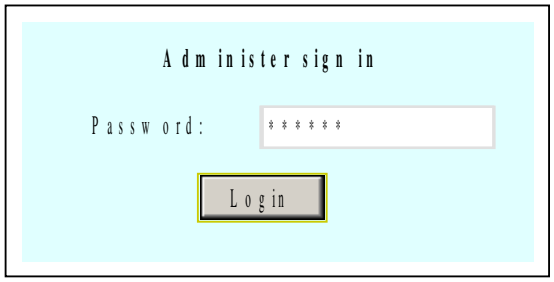
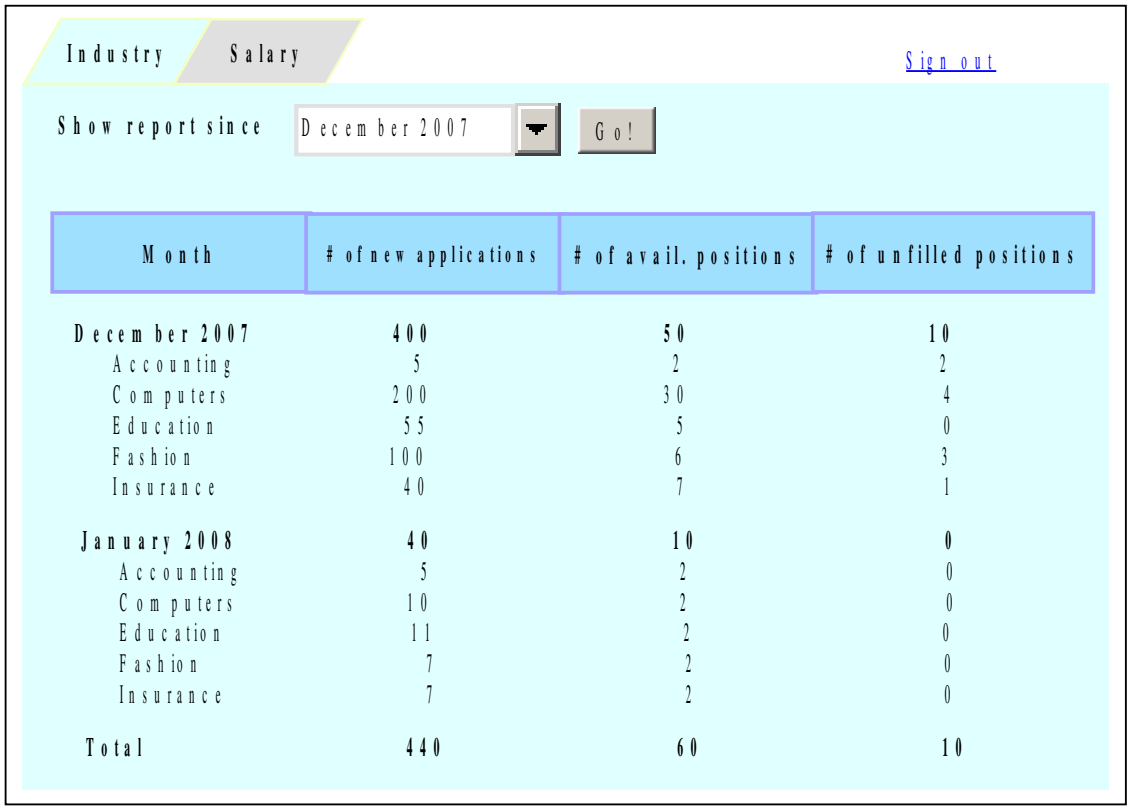


Figure C1

After signing in, the administrator can view two reports about the numbers of applications and positions, broken down by industry and salary, as shown in figure C2 and C3. The lines on these reports show the following numbers.

- **Number of new applications**: the number of times all applicants have applied for a job in each month. To be precise, the number of new applications of each applicant in each month is the number of times this applicant *clicked* the "apply" button in figure A5. The number of new applications shown in this report is the summation of these numbers over all applicants.
- **Number of available positions**: the summation of the number of positions left unfilled from the previous month and the number of new positions posted. Note that there might be many positions wanted for a single job.
- **Number of unfilled positions**: the number of positions that are unfilled in the end of each month. Note that we count only the number of *open* unfilled positions. That is, some jobs may be closed before all their positions are filled (see figure B2). We do *not* count these positions as unfilled.

The administrator can choose to show the report starting from any month. Figure C2 shows the report of the above numbers *in each industry*.



Month	# of new applications	# of avail. positions	# of unfilled positions
December 2007	**400**	**50**	**10**
Accounting	5	2	2
Computers	200	30	4
Education	55	5	0
Fashion	100	6	3
Insurance	40	7	1
January 2008	**40**	**10**	**0**
Accounting	5	2	0
Computers	10	2	0
Education	11	2	0
Fashion	7	2	0
Insurance	7	2	0
Total	440	60	10

Figure C2 (Assumes that this report was printed in January 2008)

Figure C3 shows the report of the above numbers *in each minimum salary range*. (Recall that the minimum salary has to be entered when a job is posted. See figure B5.)

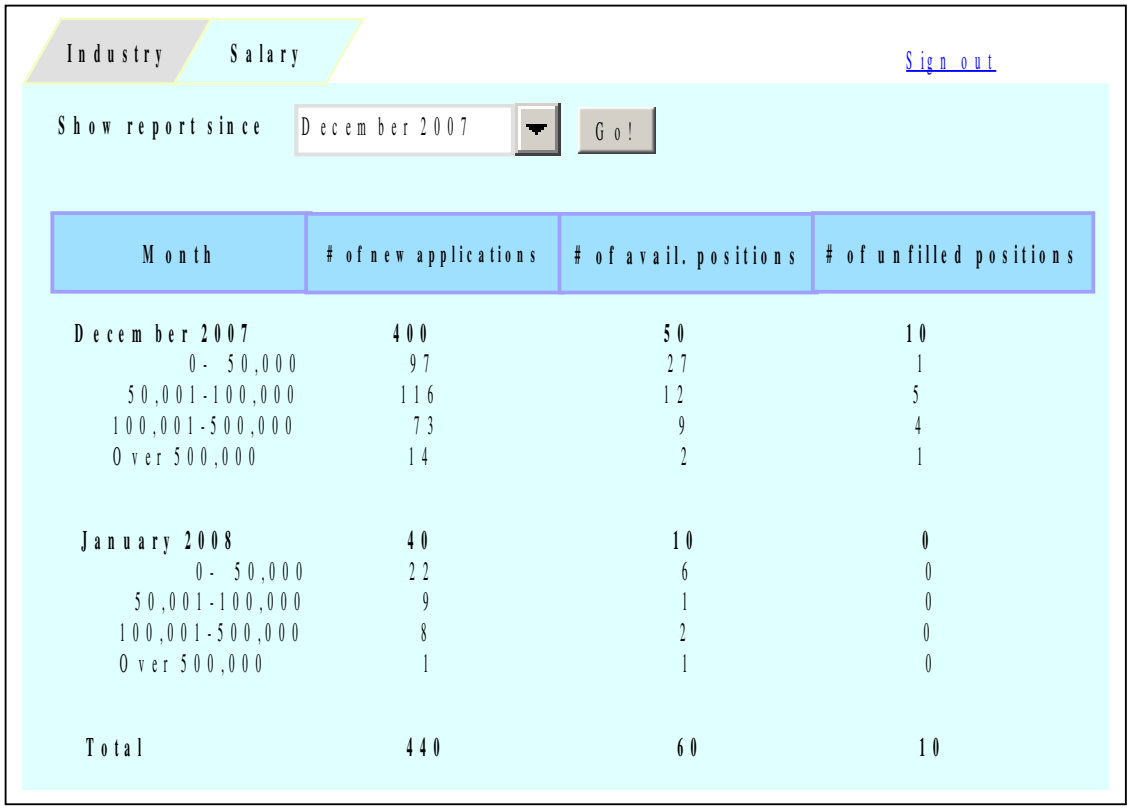


Figure C3 (Assumes that this report was printed in January 2008)

End of Project Description