ReadMe file for Final project

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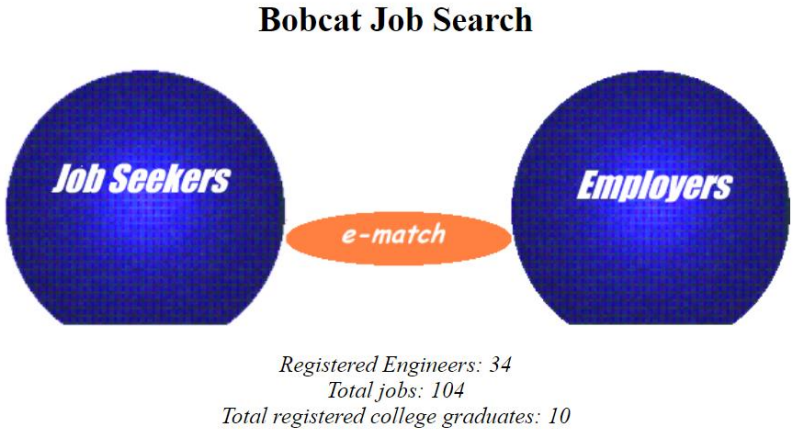
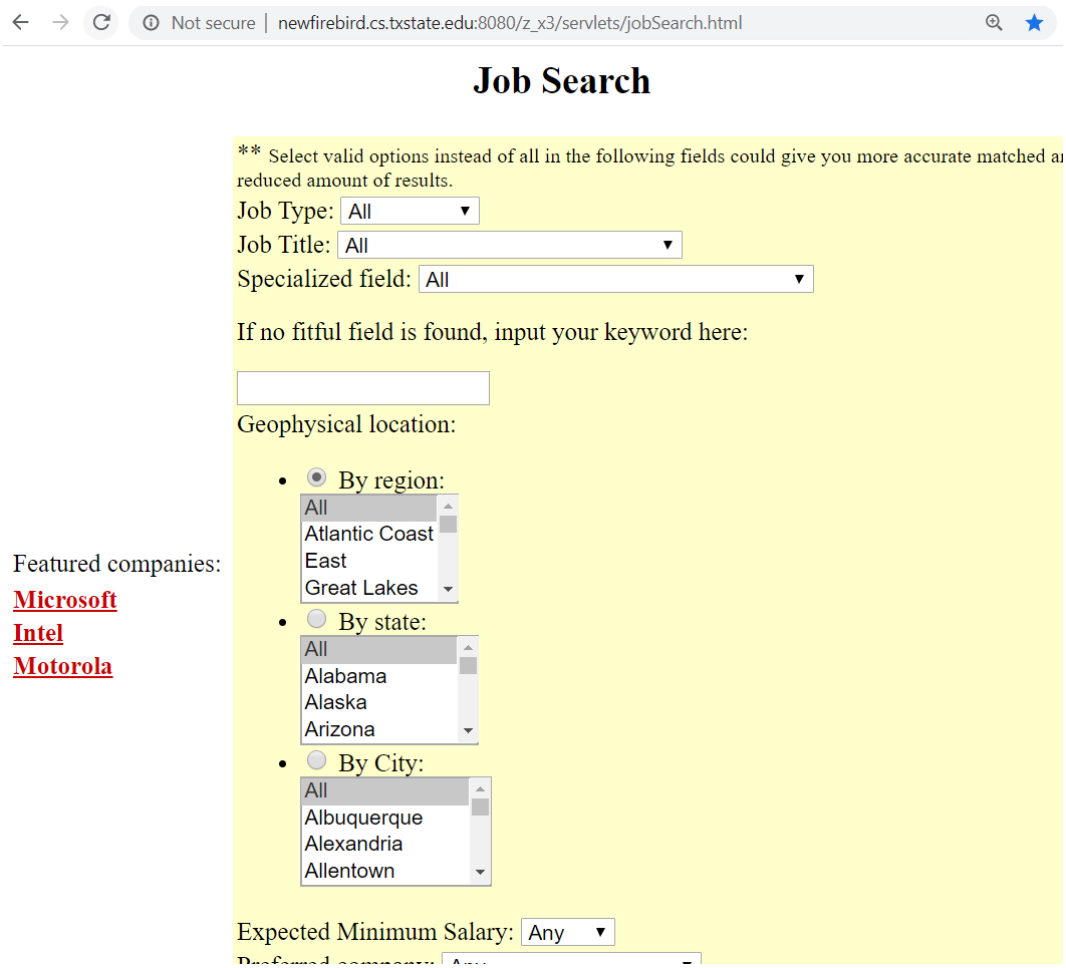
1. I am the only one in this team.

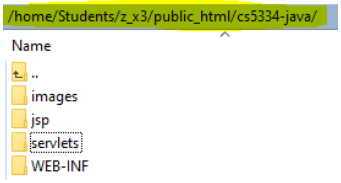
2. Portal: http://newfirebird.cs.txstate.edu:8080/z_x3/servlets/ematch.jsp



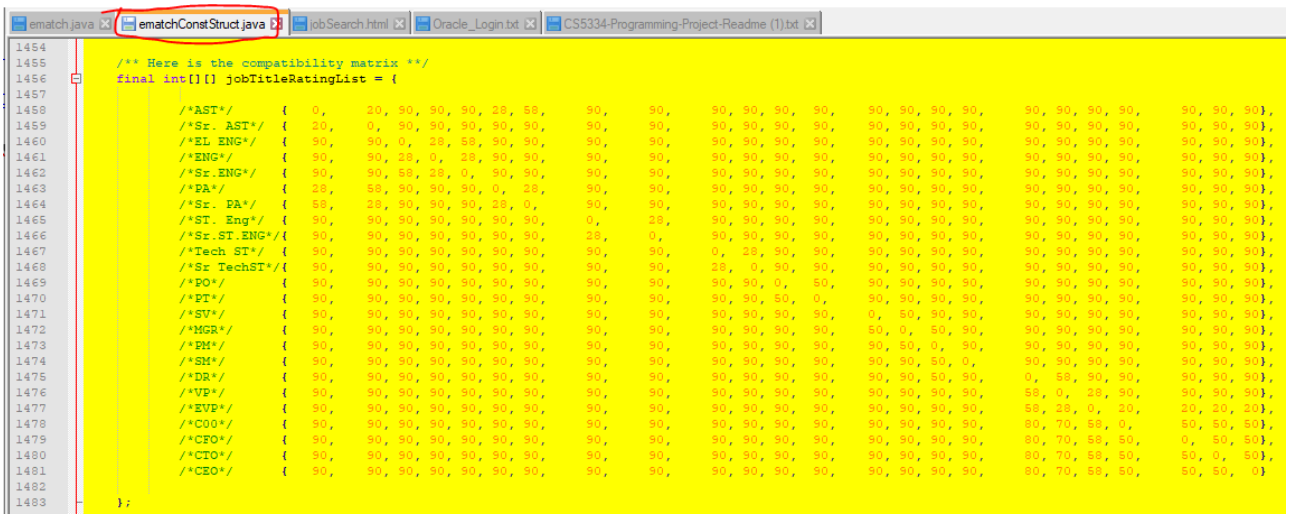
3. Testing URL: http://newfirebird.cs.txstate.edu:8080/z_x3/servlets/jobSearch.html



4. Source code location: **/home/Students/z_x3/public_html/cs5334-java**



5. Extended function one: rating with "Job Title"
   1) In ematchConstStruct.java → Setup the job title compatibility matrix



2) In ematch.java → buildJobQuery method → Updated the SQL (Select the records related to “Job Title”)

ematch.java | ematchConstStruct.java | jobSearch.html | Oracle_Login.txt | CS5334-Programming-Project-Readme

```
137     /********************* jobTitle *********************/
138
139     paraValues[constStruct.JOB_TABLE_JOB_TITLE] = request.getParameter("jobTitle");
140
141     String a = paraValues[constStruct.JOB_TABLE_JOB_TITLE];
142
143     String[] aSplit = a.split("\\s+");
144     String lastOne = null; String lastSec = null;
145     String[] aValid = new String[]{};
146
147     if(aSplit.length >=3){
148         lastOne = aSplit[aSplit.length-1];
149         lastSec = aSplit[aSplit.length-2];
150
151         aValid = new String[]{lastOne,lastSec};
152     } else {
153         lastOne = aSplit[aSplit.length-1];
154
155         aValid = new String[]{lastOne};
156     }
157
158     if (!a.equalsIgnoreCase("all")) {
159         for(String pin : aValid) {
160             if (addAND == 1)
161                 jobQuerySqlStmt += " OR job_title LIKE '%" + pin + "%'";
162             else
163                 jobQuerySqlStmt += " where job_title LIKE '%" + pin + "%'";
164             addAND = 1;
165         }
166     }
```

3) In ematch.java → computeAJobRating method → incorporate the “Job Title” rating

- Further calculate the rate by calling another function “computeJobTitleRating”

ematch.java | ematchConstStruct.java | jobSearch.html | Oracle_Login.txt | CS5334-Programming-

```
2291                // Check for job title and job specification
2292                else if ((i == constStruct.JOB_TABLE_JOB_TITLE)) {
2293
2294                    String jobTitle_check = curRow[i + 1];
2295
2296                    tmpRating -= computeJobTitleRating(jobTitle_check, out);
2297
2298                }
2299
```

- This will calculate the rate according to the job title relationship matrix. For example, if 100% match, then the rate will comes to 0 or negative. If they are related, the rate will become smaller which means better match.

```
2327    /********* Job Title Rating *********/
2328    public int computeJobTitleRating(String jobTitle_check, PrintWriter out) throws
2329
2330        String targetJobTitle = paraValues[constStruct.JOB_TABLE_JOB_TITLE];
2331
2332        int a = findJobTitleIndex(targetJobTitle);
2333
2334        int b = findJobTitleIndex(jobTitle_check);
2335
2336        int[][] jobTitleMatrix = constStruct.jobTitleRatingList;
2337
2338        int rating = jobTitleMatrix[a][b];
2339
2340        return rating;
2341    }
```

6. Extended function two: rating with “Job specification”

1) In ematchConstStruct.java I Originally I plan to implement the specialityAreaNeighbor matrix but it is too big

ematchConstStruct.java | jobSearch.html | Oracle_Login.txt | CS5334-Programming-Project-Readme (1).txt

```
final int specialtyAreaNeighbor[] = {

        Accounting, 0,  E-Commerce Development, 30, Sales, 40,
        Analog Design, 0, Logic Design, 20, VLSI Design, 40,
        Client Server Application Development, 0, Multimedia Application Development, 30, Embedded Software Develo
        Database Administration, 0,  System Administration, 30,  UNIX Administration, 20,
        Database Development, 0, Database Administration, 80,
        Device Driver Development, 0, Embedded Software Development, 70,
        Digital Design, 0, Analog Design, 70, Logic Design,60, VLSI Design, 90,
        District Sales, 0, Sales, 90, Accounting, 50,  E-Commerce Development, 30,
        E-Commerce Development, 0, Accounting, 50, Sales, 40,
        Embedded Software Development, 0, Embedded System, 90,
        Embedded System, 0, Embedded Software Development, 90,
        Engineering, 0, Java Development, 95, Oracle Development, 95, Process Integration, 95, Visual Basic Develo
        95, Embedded System, 95, Embedded Software Development, 95,
        Equipment, 0,
        Field Application, 0, Field Service, 70, Manufacturing, 70,
        Field Service, 0, Java Development, 95, Oracle Development, 95
        Java Development, 0, Oracle Development, 90, Visual Basic Development, 60,
        Logic Design, 0, Digital Design, 0, Analog Design, 70,
        Mac Development, 0,
        Manufacturing, 0, Field Application, 0, Field Service, 70,
        Marketing, 0, Strategic Marketing, 0,
        MS Access Development, 0, Java Development, 0, Oracle Development, 90, Visual Basic Development, 60,
        Multimedia Application Development, 0, MS Access Development, 0,
        Network Security, 0, UNIX Administration, 70, UNIX System Programming, 50,
        Network Programming, 0, UNIX Administration, 70, UNIX System Programming, 50,
        Operation, 0,
        Oracle DBA, 0, Oracle Development, 70,
        Oracle Development, 0, Oracle DBA, 70,
        Process, 0, Process Integration, 90,
        Process Integration, 90,
        Product, 0, Product Development, 50, Production, 50,
        Product Development, 0, Production, 50,
        Production, 0, Product, 0, Product Development, 50,
        Project Management, 0, Process, 50,
        Quality Control, 0, Reliability, 60,
        R&D, 0,
        Reliability, 0,
        Sales, 0, Accounting, 50,  E-Commerce Development, 30,
        Signal Integrity, 0, Embedded Software Development, 70, Embedded System, 90,
        Strategic Marketing, 0, Marketing, 80,
        System, 0, System Administration, 90, System Design, 90, System Quality Control, 90, System Testing, 90, T
        System Administration, 0, System, 0, System Administration, 90, System Design, 90, System Quality Control,
        System Design, 0, System, 0, System Administration, 90, System Design, 90,
```

2) Later I directly updated the ematch.java

ematch.java | ematchConstStruct.java | jobSearch.html | Oracle_Login.txt | CS5334-Programming-Project-Readme (1).txt

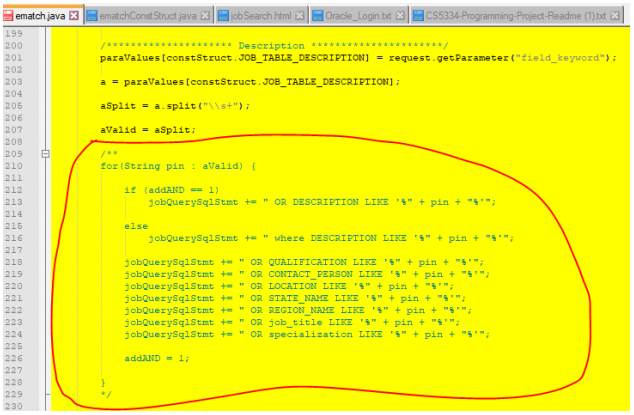
```
168
169         /********************* specialty **********************/
170         paraValues[constStruct.JOB_TABLE_SPECIALIZATION] = request.getParameter("specialty");
171
172         a = paraValues[constStruct.JOB_TABLE_SPECIALIZATION];
173
174         aSplit = a.split("\\s+");
175
176         if(aSplit.length >=3){
177              lastOne = aSplit[aSplit.length-1];
178              lastSec = aSplit[aSplit.length-2];
179
180              aValid = new String[]{lastOne,lastSec};
181         } else {
182
183              aValid = aSplit;
184         }
185
186         if (!a.equalsIgnoreCase("all")) {
187
188             for(String pin : aValid) {
189
190                 if (addAND == 1)
191                     jobQuerySqlStmt += " OR specialization LIKE '%" + pin + "%'";
192                 else
193                     jobQuerySqlStmt += " where specialization LIKE '%" + pin + "%'";
194                 addAND = 1;
195
196             }
197         }
198
199
```

3) Added the rating logic as below:

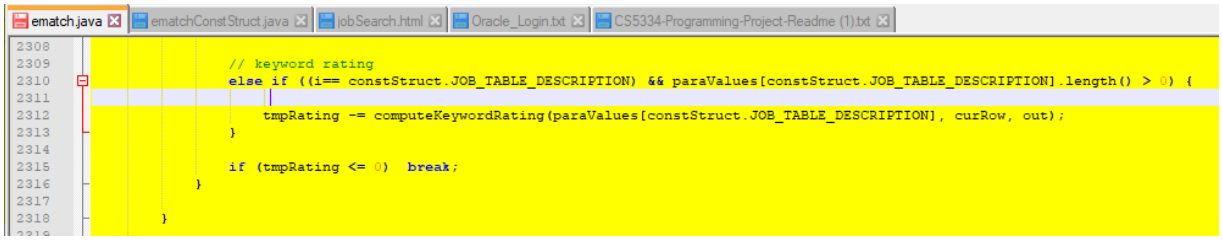
```
343     /********* Job Spec Rating *********/
344     public int computeJobSpecRating(String jobSpec_check, PrintWriter out) throws IOException, ServletException {
345
346         String targetJobSpec = paraValues[constStruct.JOB_TABLE_SPECIALIZATION];
347
348         int rating = 0;
349
350         if( targetJobSpec.trim() == jobSpec_check.trim() ) {
351           rating = 100;
352         } else {
353
354             boolean overLap = false;
355
356             String[] targetSplit = targetJobSpec.split("\\s+");
357
358             String[] currentSplit = jobSpec_check.split("\\s+");
359
360
361             for(String a: targetSplit){
362
363                 for(String b:currentSplit){
364
365                     if(a == b) overLap = true;
366                 }
367             }
368
369             if(overLap) rating = 30;
370             else rating = 0;
371         }
372
373         return rating;
374     }
375
```

If the areas are the same, 100 score earned. If there are words overlapping, 30 score earned. Otherwise 0 score earned.

7. Extended function three: search by “Key Word”
   1) This one bear more logics. I originally decided to filter on SQL level but I found the result is not good.



   1) Then I released the SQL conditions and attempt to work on ematch.java



   2) Added the calculation function:

ematch.java | ematchConstStruct.java | jobSearch.html | Oracle_Login.txt | CS5334-Programming-Project-Readme (1).txt

```
2376    public int computeKeywordRating(String keyword, String oneRow[], PrintWriter out) throws IOException, ServletExceptio
2377
2378        boolean foundInDescription = false;
2379        boolean foundInSpec = false;
2380
2381        // if description is not empty
2382        if ((oneRow[constStruct.JOB_TABLE_DESCRIPTION + 1] != null) &&
2383            oneRow[constStruct.JOB_TABLE_DESCRIPTION + 1].toLowerCase().contains(keyword.toLowerCase())) {
2384
2385            // highlight each keyword
2386            oneRow[constStruct.JOB_TABLE_DESCRIPTION + 1] = oneRow[constStruct.JOB_TABLE_DESCRIPTION + 1].replaceAll("(?
2387                                                                + keyword, "<font color=\"red\"><b>"
2388                                                                + keyword + "</b></font>");
2389            foundInDescription = true;
2390        }
2391
2392        // if specification is not empty
2393        if ((oneRow[constStruct.JOB_TABLE_SPECIALIZATION + 1] != null) && oneRow[constStruct.JOB_TABLE_SPECIALIZATION +
        keyword.toLowerCase())) {
2394
2395            // highlight each  keyword
2396            oneRow[constStruct.JOB_TABLE_SPECIALIZATION + 1] =
2397                oneRow[constStruct.JOB_TABLE_SPECIALIZATION + 1].replaceAll("(?i)" + keyword, "<font color=\"#01DF01\"><
                );
2398            foundInSpec = true;
2399        }
2400
2401
2402        // if job title is not empty
2403        if ((oneRow[constStruct.JOB_TABLE_JOB_TITLE + 1] != null) && oneRow[constStruct.JOB_TABLE_JOB_TITLE + 1].toLower
        toLowerCase())) {
2404
2405            // highlight each  keyword
2406            oneRow[constStruct.JOB_TABLE_JOB_TITLE + 1] =
2407                oneRow[constStruct.JOB_TABLE_JOB_TITLE + 1].replaceAll("(?i)" + keyword, "<font color=\"#210B61\"><b>" +
2408            foundInSpec = true;
2409        }
2410
2411
2412        // if job title is not empty
2413        if ((oneRow[constStruct.JOB_TABLE_JOB_TITLE + 1] != null) && oneRow[constStruct.JOB_TABLE_JOB_TITLE + 1].toLower
        toLowerCase())) {
2414
2415            // highlight each  keyword
2416            oneRow[constStruct.JOB_TABLE_JOB_TITLE + 1] =
2417                oneRow[constStruct.JOB_TABLE_JOB_TITLE + 1].replaceAll("(?i)" + keyword, "<font color=\"red\"><b>" + key
2418            foundInSpec = true;
```

Firstly I check the description. Earn 20 score if found a good match.

Secondly, I will check specification. Earn 55 score if found a good match.

Thirdly, I will scan most of the other fields in the job table. Earn 40 score if found a good match.

8. To compile and test:

```
rm -f *.class
javac *.java
chmod 744 *.class
touch   web.xml
```

9. The job table:

```
SQL> desc job;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 JOB_ID                                    NOT NULL VARCHAR2(10)
 JOB_TYPE                                           VARCHAR2(40)
 JOB_TITLE                                          VARCHAR2(50)
 SPECIALIZATION                                     VARCHAR2(50)
 COUNTRY_CODE                                       NUMBER(3)
 REGION_NAME                                        VARCHAR2(30)
 STATE_NAME                                         VARCHAR2(20)
 LOCATION                                           VARCHAR2(30)
 MIN_SALARY                                         NUMBER(9)
 MAX_SALARY                                         NUMBER(9)
 COMPANY_NAME                                       VARCHAR2(50)
 START_DATE                                         VARCHAR2(20)
 REFERENCE_NUM                                      VARCHAR2(10)
 CONTACT_PERSON                                     VARCHAR2(50)
 DESCRIPTION                                        VARCHAR2(4000)
 QUALIFICATION                                      VARCHAR2(2000)

SQL>
```

10. Same test case:
    1) Search “Programmer Analyst” on Job Title field

Job Search Results

(total 12 matches)

Rating	Job Title	Specialty	Location	Company	Salary Range
100	Programmer Analyst	Mac Development	Pittsburgh	Apple Computers	56000-71000
100	Programmer Analyst	Java Development	Southwest	Wal-Mart	50000-60000
100	Programmer Analyst	Marketing	Atlanta (Atlantic Coast)	Ford	59000-79000
72	Analyst	Accounting	Raleigh (North Carolina, Atlantic Coast)	IBC	55000-70000
72	Analyst	Database Development	San Francisco	Microsoft	50000-70000
72	Analyst	Digital Design	Seattle (Washington, Northwest)	Microsoft	60000-75000
72	Analyst	Database Development	San Francisco	GE	55000-70000
42	Senior Analyst	Web Development	Austin	Microsoft	60000-90000
42	Senior Analyst	E-Commerce Development	Portland	Intel	65000-98000
42	Senior Analyst	Database Development	Buffalo	IDS	40000-55000
42	Senior Analyst	Database Administration	Austin	IBM	40000-67000
42	Senior Analyst	Database Administration	San Jose	Oracle	65000-95000

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    2) Search “Analog Design” on Job Specification filed

Job Search Results

(total 10 matches)

Rating	Job Title	Specialty	Location	Company	Salary Range
100	Engineer	Analog Design	Austin (Texas)	Cirrus Logic	50000-58000
100	Engineer	Digital Design	Austin (Texas)	Cirrus Logic	30000-38000
100	Engineer	Digital Design	Austin (Texas)	Dell	30000-55000
100	Director	Analog Design	Austin (Texas)	Cirrus Logic	70000-78000
100	Project Manager	Digital Design	Austin (Texas)	Cirrus Logic	75000-83000
100	Senior Engineer	Design	Santa Clara	Oracle	50000-60000
100	Senior Engineer	System Design	San Jose	Oracle	65000-75000
100	Senior Engineer	Design	San Jose	Oracle	70000-80000
100	Director	Design	Santa Clara	Oracle	120000-130000
100	Analyst	Digital Design	Seattle (Washington, Northwest)	Microsoft	60000-75000

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3) Search “Development” on Key Word fields:

Job Search Results

(total 24 matches)

Rating	Job Title	Specialty	Location	Company	Salary Range
45	Senior Engineer	Mac **Development**	Austin (Texas)	Apple Computers	35000-50000
45	Manager	Java **Development**	El Paso (Texas)	Compaq	65000-73000
45	Engineer	Mac **Development**	Fremont	Computer Associates	110000-118000
45	Engineer	Oracle **Development**	Houston (Texas)	Motorola	55000-63000
45	Engineer	Java **Development**	Oakland (Pacific)	Apple Computers	56000-64000
45	Engineer	Windows **Development**	Portland	Intel	32000-40000
45	Engineer	Windows **Development**	Santa Clara	Microsoft	40000-48000
45	Engineer	Java **Development**	San Jose	Broadcom	95000-103000
45	Engineer	Java **Development**	San Diego	SUN Microsystems	75000-87000
45	Senior Engineer	MS Access **Development**	Philadelphia	Bank One Corp	85000-95000
45	Supervisor	Java **Development**	New York	Merril Lynch	90000-100000
45	Engineer	Java **Development**	Hartford	Oracle	95000-105000
45	Entry level Engineer	Java **Development**	Buffalo	IBM	35000-48000
45	Analyst	Database **Development**	San Francisco	Microsoft	50000-70000
45	Analyst	Database **Development**	San Francisco	GE	55000-70000
45	Senior Analyst	Web **Development**	Austin	Microsoft	60000-90000

4) Search “Austin” on Key Words field:

Job Search Results

(total 17 matches)

Rating	Job Title	Specialty	Location	Company	Salary Range
45	Entry level Engineer	UNIX System Programming	**Austin** (Texas)	SUN Microsystems	56000-68000
45	Senior Engineer	Process	**Austin** (Texas)	AMD	55000-63000
45	Engineer	Accounting	**Austin** (Texas)	Motorola	32000-40000
45	Engineer	Device	**Austin** (Texas)	Motorola	32000-40000
45	Engineer	Analog Design	**Austin** (Texas)	Cirrus Logic	50000-58000
45	Engineer	System	**Austin** (Texas)	Cirrus Logic	55000-63000
45	Senior Engineer	UNIX System Programming	**Austin** (Texas, Southwest)	BMC	45000-53000
45	Engineer	Digital Design	**Austin** (Texas)	Cirrus Logic	30000-38000
45	Senior Engineer	Mac Development	**Austin** (Texas)	Apple Computers	35000-50000
45	Engineer	Digital Design	**Austin** (Texas)	Dell	30000-55000
45	Director	Analog Design	**Austin** (Texas)	Cirrus Logic	70000-78000
45	Project Manager	Digital Design	**Austin** (Texas)	Cirrus Logic	75000-83000
45	Senior Engineer	System Integration	**Austin** (Texas)	Sam Sung	51000-76000
45	Engineer	Product	**Austin** (Texas)	Cirrus Logic	100000-108000
45	Engineer	Software	**Austin** (Texas)	Cirrus Logic	125000-133000