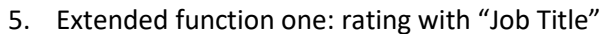


Zebo Xiong - A04907051

- /home/Students/z_x3/public_html/cs5334-java/



- ```
ematch.java ematchConstStruct.java jobSearch.html Oracle_Login.txt CS5334-Programming-Project-Readme (1).txt
```
- ```
1454  
1455 /** Here is the compatibility matrix **/  
1456 final int[][] jobTitleRatingList = {  
1457  
1458     /*AST*/      { 0,    20, 90, 90, 90, 90, 28, 58,   90,   90,   90, 90, 90,   90, 90, 90, 90,   90, 90, 90},  
1459     /*Sr_AST*/   { 20,   0, 90, 90, 90, 90, 90, 90,   90,   90,   90, 90, 90,   90, 90, 90, 90,   90, 90, 90},  
1460     /*EL_ENG*/   { 90,   90, 0, 28, 58, 90, 90, 90,   90,   90,   90, 90, 90,   90, 90, 90, 90,   90, 90, 90},  
1461     /*ENG*/      { 90,   90, 28, 0, 28, 90, 90, 90,   90,   90,   90, 90, 90,   90, 90, 90, 90,   90, 90, 90},  
1462     /*Sr_ENG*/   { 90,   90, 58, 28, 0, 90, 90, 90,   90,   90,   90, 90, 90,   90, 90, 90, 90,   90, 90, 90},  
1463     /*PA*/       { 28,   58, 90, 90, 90, 90, 0, 28,   90,   90,   90, 90, 90,   90, 90, 90, 90,   90, 90, 90},  
1464     /*Sr_PA*/    { 58,   28, 90, 90, 90, 90, 28, 0,   90,   90,   90, 90, 90,   90, 90, 90, 90,   90, 90, 90},  
1465     /*ST_ENg*/   { 90,   90, 90, 90, 90, 90, 90, 90,   0,   28,   90,   90, 90, 90,   90, 90, 90, 90,   90, 90, 90},  
1466     /*Sr_ST_ENG*/{ 90,   90, 90, 90, 90, 90, 90, 90,   28, 0,   90,   90, 90, 90,   90, 90, 90, 90,   90, 90, 90},  
1467     /*Tech ST*/  { 90,   90, 90, 90, 90, 90, 90, 90,   90, 28, 90,   90, 90, 90,   90, 90, 90, 90,   90, 90, 90},  
1468     /*Sr TechST*/{ 90,   90, 90, 90, 90, 90, 90, 90,   90, 90, 28, 0, 90,   90, 90, 90,   90, 90, 90},  
1469     /*PO*/       { 90,   90, 90, 90, 90, 90, 90, 90,   90, 90, 90, 0, 80,   90, 90, 90, 90,   90, 90, 90},  
1470     /*PT*/       { 90,   90, 90, 90, 90, 90, 90, 90,   90, 90, 90, 80, 0,   90, 90, 90, 90,   90, 90, 90},  
1471     /*SV*/       { 90,   90, 90, 90, 90, 90, 90, 90,   90, 90, 90, 90, 0,   0, 90, 90, 90, 90,   90, 90, 90},  
1472     /*MGR*/      { 90,   90, 90, 90, 90, 90, 90, 90,   90, 90, 90, 90, 90,   50, 0, 50, 90, 90, 90,   90, 90, 90},  
1473     /*PM*/       { 90,   90, 90, 90, 90, 90, 90, 90,   90, 90, 90, 90, 90,   90, 50, 0, 50, 90, 90, 90,   90, 90, 90},  
1474     /*SM*/       { 90,   90, 90, 90, 90, 90, 90, 90,   90, 90, 90, 90, 90,   90, 90, 50, 0, 90, 90, 90, 90,   90, 90, 90},  
1475     /*DR*/       { 90,   90, 90, 90, 90, 90, 90, 90,   90, 90, 90, 90, 90,   90, 90, 90, 50, 0, 58, 90, 90, 90,   90, 90, 90},  
1476     /*VP*/       { 90,   90, 90, 90, 90, 90, 90, 90,   90, 90, 90, 90, 90,   90, 90, 90, 90, 58, 0, 28, 90, 90, 90,   90, 90, 90},  
1477     /*EVP*/      { 90,   90, 90, 90, 90, 90, 90, 90,   90, 90, 90, 90, 90,   90, 90, 90, 90, 58, 28, 0, 20, 90, 90, 90,   90, 90, 90},  
1478     /*COO*/      { 90,   90, 90, 90, 90, 90, 90, 90,   90, 90, 90, 90, 90,   90, 90, 90, 90, 90, 70, 58, 0, 90, 90, 90,   90, 90, 90},  
1479     /*CFO*/      { 90,   90, 90, 90, 90, 90, 90, 90,   90, 90, 90, 90, 90,   90, 90, 90, 90, 90, 70, 58, 50, 0, 90, 90, 90,   90, 90, 90},  
1480     /*CTO*/      { 90,   90, 90, 90, 90, 90, 90, 90,   90, 90, 90, 90, 90,   90, 90, 90, 90, 90, 70, 58, 50, 90, 0, 90, 90,   90, 90, 90},  
1481     /*CEO*/      { 90,   90, 90, 90, 90, 90, 90, 90,   90, 90, 90, 90, 90,   90, 90, 90, 90, 90, 70, 58, 50, 90, 70, 58, 50,   90, 90, 90},  
1482 };
```

- ```

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 jobQuerySqlStmnt += " OR job_title LIKE '%" + pin + "%'";
162 else
163 jobQuerySqlStmnt += " 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 come 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 specialityAreaNeighbor[] = {

 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 Development,
 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 Development,
 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,
 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

## 3) Added the rating logic as below:

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

```
ematch.java ematchConstStruct.java jobSearch.html Oracle_Login.txt CS5334-Programming-Project-Readme (1).txt
2308 // keyword rating
2309 else if ((i== constStruct.JOB_TABLE_DESCRIPTION) && paraValues[constStruct.JOB_TABLE_DESCRIPTION].length() > 0) {
2310 tmpRating += computeKeywordRating(paraValues[constStruct.JOB_TABLE_DESCRIPTION], curRow, out);
2311 }
2312 if (tmpRating <= 0) break;
2313 }
2314 }
2315 }
2316 }
2317 }
2318 }
```

- 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, ServletException {
2377 boolean foundInDescription = false;
2378 boolean foundInSpec = false;
2379 // if description is not empty
2380 if ((oneRow[constStruct.JOB_TABLE_DESCRIPTION + 1] != null) &&
2381 oneRow[constStruct.JOB_TABLE_DESCRIPTION + 1].toLowerCase().contains(keyword.toLowerCase())) {
2382 // highlight each keyword
2383 oneRow[constStruct.JOB_TABLE_DESCRIPTION + 1] = oneRow[constStruct.JOB_TABLE_DESCRIPTION + 1].replaceAll("(?i)" + keyword, "" + keyword + "");
2384 foundInDescription = true;
2385 }
2386 // if specification is not empty
2387 if ((oneRow[constStruct.JOB_TABLE_SPECIALIZATION + 1] != null) && oneRow[constStruct.JOB_TABLE_SPECIALIZATION + 1].toLowerCase().contains(keyword.toLowerCase())) {
2388 // highlight each keyword
2389 oneRow[constStruct.JOB_TABLE_SPECIALIZATION + 1] = oneRow[constStruct.JOB_TABLE_SPECIALIZATION + 1].replaceAll("(?i)" + keyword, "" + keyword + "");
2390 foundInSpec = true;
2391 }
2392 // if job title is not empty
2393 if ((oneRow[constStruct.JOB_TABLE_JOB_TITLE + 1] != null) && oneRow[constStruct.JOB_TABLE_JOB_TITLE + 1].toLowerCase().contains(keyword.toLowerCase())) {
2394 // highlight each keyword
2395 oneRow[constStruct.JOB_TABLE_JOB_TITLE + 1] = oneRow[constStruct.JOB_TABLE_JOB_TITLE + 1].replaceAll("(?i)" + keyword, "" + keyword + "");
2396 foundInSpec = true;
2397 }
2398 // if job title is not empty
2399 if ((oneRow[constStruct.JOB_TABLE_JOB_TITLE + 1] != null) && oneRow[constStruct.JOB_TABLE_JOB_TITLE + 1].toLowerCase().contains(keyword.toLowerCase())) {
2400 // highlight each keyword
2401 oneRow[constStruct.JOB_TABLE_JOB_TITLE + 1] = oneRow[constStruct.JOB_TABLE_JOB_TITLE + 1].replaceAll("(?i)" + keyword, "" + keyword + "");
2402 foundInSpec = true;
2403 }
2404 }
```

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)

```

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    | <a href="#">Programmer Analyst</a> | Mac Development         | Pittsburgh                               | Apple Computers | 56000-71000  |
| 100    | <a href="#">Programmer Analyst</a> | Java Development        | Southwest                                | Wal-Mart        | 50000-60000  |
| 100    | <a href="#">Programmer Analyst</a> | Marketing               | Atlanta (Atlantic Coast)                 | Ford            | 59000-79000  |
| 72     | <a href="#">Analyst</a>            | Accounting              | Raleigh (North Carolina, Atlantic Coast) | IBC             | 55000-70000  |
| 72     | <a href="#">Analyst</a>            | Database Development    | San Francisco                            | Microsoft       | 50000-70000  |
| 72     | <a href="#">Analyst</a>            | Digital Design          | Seattle (Washington, Northwest)          | Microsoft       | 60000-75000  |
| 72     | <a href="#">Analyst</a>            | Database Development    | San Francisco                            | GE              | 55000-70000  |
| 42     | <a href="#">Senior Analyst</a>     | Web Development         | Austin                                   | Microsoft       | 60000-90000  |
| 42     | <a href="#">Senior Analyst</a>     | E-Commerce Development  | Portland                                 | Intel           | 65000-98000  |
| 42     | <a href="#">Senior Analyst</a>     | Database Development    | Buffalo                                  | IDS             | 40000-55000  |
| 42     | <a href="#">Senior Analyst</a>     | Database Administration | Austin                                   | IBM             | 40000-67000  |
| 42     | <a href="#">Senior Analyst</a>     | Database Administration | San Jose                                 | Oracle          | 65000-95000  |

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2) Search "Analog Design" on Job Specification field

#### Job Search Results

(total 10 matches)

| Rating | Job Title                       | Specialty      | Location                        | Company      | Salary Range  |
|--------|---------------------------------|----------------|---------------------------------|--------------|---------------|
| 100    | <a href="#">Engineer</a>        | Analog Design  | Austin (Texas)                  | Cirrus Logic | 50000-58000   |
| 100    | <a href="#">Engineer</a>        | Digital Design | Austin (Texas)                  | Cirrus Logic | 30000-38000   |
| 100    | <a href="#">Engineer</a>        | Digital Design | Austin (Texas)                  | Dell         | 30000-55000   |
| 100    | <a href="#">Director</a>        | Analog Design  | Austin (Texas)                  | Cirrus Logic | 70000-78000   |
| 100    | <a href="#">Project Manager</a> | Digital Design | Austin (Texas)                  | Cirrus Logic | 75000-83000   |
| 100    | <a href="#">Senior Engineer</a> | Design         | Santa Clara                     | Oracle       | 50000-60000   |
| 100    | <a href="#">Senior Engineer</a> | System Design  | San Jose                        | Oracle       | 65000-75000   |
| 100    | <a href="#">Senior Engineer</a> | Design         | San Jose                        | Oracle       | 70000-80000   |
| 100    | <a href="#">Director</a>        | Design         | Santa Clara                     | Oracle       | 120000-130000 |
| 100    | <a href="#">Analyst</a>         | 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     | <a href="#">Senior Engineer</a>      | Mac <b>Development</b>       | Austin (Texas)    | Apple Computers     | 35000-50000   |
| 45     | <a href="#">Manager</a>              | Java <b>Development</b>      | El Paso (Texas)   | Compaq              | 65000-73000   |
| 45     | <a href="#">Engineer</a>             | Mac <b>Development</b>       | Fremont           | Computer Associates | 110000-118000 |
| 45     | <a href="#">Engineer</a>             | Oracle <b>Development</b>    | Houston (Texas)   | Motorola            | 55000-63000   |
| 45     | <a href="#">Engineer</a>             | Java <b>Development</b>      | Oakland (Pacific) | Apple Computers     | 56000-64000   |
| 45     | <a href="#">Engineer</a>             | Windows <b>Development</b>   | Portland          | Intel               | 32000-40000   |
| 45     | <a href="#">Engineer</a>             | Windows <b>Development</b>   | Santa Clara       | Microsoft           | 40000-48000   |
| 45     | <a href="#">Engineer</a>             | Java <b>Development</b>      | San Jose          | Broadcom            | 95000-103000  |
| 45     | <a href="#">Engineer</a>             | Java <b>Development</b>      | San Diego         | SUN Microsystems    | 75000-87000   |
| 45     | <a href="#">Senior Engineer</a>      | MS Access <b>Development</b> | Philadelphia      | Bank One Corp       | 85000-95000   |
| 45     | <a href="#">Supervisor</a>           | Java <b>Development</b>      | New York          | Merril Lynch        | 90000-100000  |
| 45     | <a href="#">Engineer</a>             | Java <b>Development</b>      | Hartford          | Oracle              | 95000-105000  |
| 45     | <a href="#">Entry level Engineer</a> | Java <b>Development</b>      | Buffalo           | IBM                 | 35000-48000   |
| 45     | <a href="#">Analyst</a>              | Database <b>Development</b>  | San Francisco     | Microsoft           | 50000-70000   |
| 45     | <a href="#">Analyst</a>              | Database <b>Development</b>  | San Francisco     | GE                  | 55000-70000   |
| 45     | <a href="#">Senior Analyst</a>       | Web <b>Development</b>       | Austin            | Microsoft           | 60000-80000   |

4) Search "Austin" on Key Words field:

**Job Search Results**

(total 17 matches)

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