

SPRING 2024 CS5334

ADVANCED INTERNET
INFORMATION PROCESSING

PROJECT REPORT

SUBMITTED BY:

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1. INTRODUCTION:

This is a standard job search for a fresh job application. By giving the client the chance to choose appropriate alternatives based on the job title, job type, specialization field, geophysical location, expected minimum salary, and preferred company, the system delivers correct matching results. This project was implemented with Python and Oracle.

The report's remaining sections are arranged as follows:

- Description of the project's existing system behavior.
- Description of the project's implemented features.

1. Use job title field as part of the ratings
2. Use company field as part of the ratings
3. Keyword feature

2. EXISTING SYSTEM BEHAVIOUR:

The key features of the demo program's current job search are explained in this section using Python and Oracle.

JOB Table

For this project, a JOB table has been developed to manage and store data related to job searches. When the web server receives a request for a job search, it initiates the creation of a basic SQL query within the JOB table.

The job search's web interface provides search drop down menus are: -

- a. Job Type
- b. Job Title
- c. Specialized field
- d. Keyword Search
- e. Search by region OR
- f. Search by state OR
- g. Search by city

h. Expected minimum salary.

i. Preferred Company

Job Type

Based on the existing behavior when the user searches for jobs with job type as ‘regular’, the search will **only** return jobs with job type ‘*regular*’. As part of the project, those jobs with other types also should be returned with some assigned penalty on ratings. There is a default value of 100 displayed for rating for all the matched rows returned.

Company Field

When the user searches for jobs with company field as ‘Google’, then **only** those jobs with Company’s name as ‘Google’ company are returned. As part of the project, along with Google’s jobs, all other related companies’ jobs are also to be returned with some penalty assigned on the ratings. There is a default value of 100 displayed for rating for all the matched rows returned.

Keyword Feature

Based on the existing behavior the Web UI has *keyword* field to input a value, but it’s not implemented. The keyword feature is basically checking the *description* column field in the JOB table.

3. FEATURES IMPLEMENTED:

1. Use the job type field as part of the ratings

To implement this feature, we made the following changes to the code in the file `ematch.py`

- We introduced a new variable **`self.askedJobType`**. This variable accepts the input from the UI where we select the required job type from the available 4 options under Job Type.

**** Select valid options instead of all in the following fields could give you more accurate matched and reduced amount of results.**

Job Type	<input type="button" value="All"/>	
Job Title:	<input type="text" value="Regular"/>	<input type="button" value="v"/>
Specializ	<input type="text" value="Entry level"/>	<input type="button" value="v"/>
If no fitf	<input type="text" value="Intern"/>	
	<input type="text" value="Co-op"/>	

input your keyword here:

- We updated the code in the function **`build_sql_query_stmt()`**. The existing code would build the SQL query in such a way that it would retrieve only those records

from the JOB table which had the job type name exactly same as the one selected by the user. As part of this project, our aim was to display all other jobs of remaining job types as well but with some penalty. We have given the penalty as 10 for unmatched job type records.

- We introduced a new function called **compute_job_type_penalty**. This function takes in a parameter – “jobType”. If the askedJobType equals with the jobType that is coming from the database, then the penalty is 0 otherwise the penalty is set to 10. This function returns penalty to the **compute_ratings** function where this function is called to update the **jobRating** as per the condition.

2. Use company field as part of the ratings

To implement this feature, we made the following changes to the code in the file `ematch.py`.

- We declared a new class variable **self.askedCompany** in the class `ematch_class`. This variable accepts data from the Web UI where user selects preferred company.
- We updated **ematch_data_struct.py** to include 2 new dictionaries. They are **company_array** and **relatedCompanies**. In the `company_array`, we kept the company names as keys and have given same value for related companies. In `relatedCompanies`, we used the above unique values as keys and the related companies together in an array as value for each key.
- We declared a new function **find_matched_companies** which takes a parameter **searchedcompany**. In this method, the dictionary `company_array` from `ematch_data_struct` is called, so that it gives us the required value. We used this value to find all the related companies from `relatedCompanies` dictionary. This `find_matched_companies` returns the list of all related companies.
- We updated the **sql_stmt** to include only related companies. A penalty has been set for the related companies so the `jobRating` will be reduced. Previously, We have organized related companies details in `company_array`. In this dictionary, we have set a common integer value for related companies. With this common integer, we have assigned penalty as the sum of this value and 10.

3.Keyword feature

To implement this feature, we made the following changes to the code in the file `ematch.py`

- We introduced a new variable **askedKeyword**. This variable takes the input from the keyword field in the UI.

**** Select valid options instead of all in the following fields could give you more accurate matched and reduced amount of results.**

Job Type:

Job Title:

Specialized field:

If no fitful field is found, input your keyword here:

- We created a new dictionary data structure with name `company_dict` where it will store company name as key and its respective description as value from the database.
- We introduced new function **find_keywords**. This function searches the above dictionary's values to find whether the given keyword exists or not. If the given keyword exists as part of description for any company , then those companies were added to a new dictionary named **self.filteredcompanies**.
- In this dictionary, if the keyword matches exactly then a value '1' is assigned, if the keyword matches only partially then the value of '2' is assigned.
- We created a new function called **keyword_penalty** to assign job ratings based on the matched keyword. If the keyword is matched exactly , then the penalty is 0. If it matched partially , then a penalty of 10 is assigned.
- In the **process_results**, we used the above described `keyword_penalty` and computed the `jobRating`. Here, we have the filtered records with updated job ratings.

To implement this feature, we made the following changes to the code in the file `jobsearch.py`

- Here , we updated the code to call the **find_keywords** function before `process_results` and `sort_results` functions.

4. URLs TO ACCESS THE PROJECT

<http://newfirebird.cs.txstate.edu/~ckw91/demo/proc/unix-version/html/index-py.html>

<http://newfirebird.cs.txstate.edu/~wcy14/demo/proc/unix-version/html/index-py.html>

5. SCREENSHOTS:



The screenshot shows a web browser window with the address bar displaying "newfirebird.cs.txstate.edu/~ckw91/". The browser's address bar also shows "Not Secure". Below the address bar, there are several icons for services like Gmail, YouTube, Maps, and a "Login" button. The main content area displays a directory listing with columns for file names, dates, and sizes. The files are listed in a table format with icons representing their types (folders, documents, archives, etc.).

	Parent Directory	-	-
	2023/	2024-04-16 23:20	-
	Program2.html	2024-04-15 18:41	2.4K
	Ques1.php	2024-04-17 18:13	548
	Question1/	2024-04-17 18:27	-
	Question1_part2.pl	2024-04-18 18:49	289
	Question2/	2024-04-17 18:28	-
	assignments.zip	2024-04-09 21:07	1.2M
	assignments/	2024-04-09 21:08	-
	background.gif	2008-03-28 23:08	172K
	cgi-bin.tar	2024-04-09 18:53	20K
	cgi-bin/	2024-04-29 18:20	-
	demo/	2024-04-20 16:34	-
	expdat.dmp	2024-04-09 18:53	80K
	html/	2024-04-15 15:43	-
	img/	2024-04-24 16:57	-
	input.txt	2024-04-17 18:06	40
	output.txt	2024-04-17 18:16	40
	pg2.html	2024-04-16 23:20	2.8K
	pg3.html	2024-04-15 19:34	2.8K
	pg5.html	2024-04-17 20:55	1.8K
	pg7.html	2024-04-17 21:48	2.1K
	proc-demo-html.tar	2024-04-09 20:17	20K
	proc-demo-source-fil.>	2024-04-15 16:51	360K
	proc-demo.tar	2024-04-09 18:53	360K
	proc-source-files-2023/	2024-04-17 19:01	-
	proc-source-files.tar	2024-04-09 20:49	230K

Index-py.html

ckw91-wcy14 Job Search x +

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DrPengsAIIPDemos Welcomes You!



Registered Engineers: 34
Total jobs: 104
Total registered college graduates: 10

DrPengsAIIPDemos.com, Python version, will assist and challenge you to be where you can be in the 21th centry in the high tech, high competitive, high reward world.

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JobType: We updated job type field for some records as “intern”. As we searched for “intern” job type, we get those records with job ratings as 100 and others with penalty of 10.

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** Select valid options instead of all in the following fields could give you more accurate matched and reduced amount of results.

Job Type:

Job Title:

Specialized field:

If no fitful field is found, input your keyword here:

Geophysical location:

- ☒ By region:
 - All
 - Atlantic Coast
 - East
 - Great Lakes
- ☐ By state:
 - All
 - Alabama
 - Alaska
 - Arizona
- ☐ By City:
 - All
 - Albuquerque
 - Alexandria
 - Allentown

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Job Search Results

(Total 104 matches)

Job Number	Rating	Job Type	Job Title	Special field	Company	City	State	Region	Salary Range
1	100	intern	Engineer	Accounting	Motorola	Austin	Texas	N/A	32000 - 40000
2	100	intern	Engineer	Device	Motorola	Austin	Texas	N/A	32000 - 40000
3	100	intern	Senior Engineer	Mac Development	Apple Computers	Austin	Texas	N/A	35000 - 50000
4	100	intern	Engineer	Java Development	Apple Computers	Oakland	N/A	Pacific	56000 - 64000
5	100	intern	Engineer	System Testing	Micron	Boise	N/A	Northwest	49000 - 65000
6	100	intern	Engineer	Windows Development	Intel	Portland	N/A	N/A	32000 - 40000
7	100	intern	Engineer	Process	Intel	Santa Fe	N/A	N/A	32000 - 40000
8	90	regular	Engineer	Analog Design	Cirrus Logic	Austin	Texas	N/A	50000 - 58000
9	90	regular	Engineer	System	Cirrus Logic	Austin	Texas	N/A	55000 - 63000
10	90	regular	Engineer	System	Lockheed	Albuquerque	N/A	Southwest	60000 - 68000
11	90	regular	Senior Engineer	UNIX System Programming	BMC	Austin	Texas	Southwest	45000 - 53000
12	90	regular	Engineer	Digital Design	Cirrus Logic	Austin	Texas	N/A	30000 - 38000
13	90	regular	Manager	Manufacturing	Intel	San Jose	California	West	80000 - 88000
14	90	regular	Engineer	Digital Design	Dell	Austin	Texas	N/A	30000 - 55000
15	90	regular	Senior Engineer	UNIX Administration	GE	Green Bay	Wisconsin	N/A	35000 - 45000
16	90	regular	Engineer	UNIX System Programming	Chase	Columbia	South Carolina	N/A	40000 - 60000

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```
qstr=job_type=intern&job_title=all&specialty=all&field_keyword=&location_type=region&min_salary=10000&company_name=all====
Database version: 11.2.0.1.0 Beginning of building sql_query_stmt job_type=intern&job_title=all&specialty=all&field_keyword=&location_type=region&min_salary=10000&company_name=all ['job_type=intern', 'job_title=
'specialty=all', 'field_keyword=', 'location_type=region', 'min_salary=10000', 'company_name=all']
self.stmt = SELECT * FROM job
Built statment = SELECT * FROM job
SELECT * FROM job
```

Job Search Results

(Total 104 matches)

Job Number	Rating	Job Type	Job Title	Special field	Company	City	State	Region	Salary Range
97	90	regular	Staff Engineer	R&D	Apple Computers	N/A	N/A	Middle-west	56000 - 80000
98	90	regular	Engineer	Device Driver Development	GE	Allentown	N/A	N/A	50000 - 60000
99	90	regular	Senior Engineer	Device Driver Development	EDS	Little Rock	Arkansas	Middle	60000 - 70000
100	90	entry level	Analyst	Digital Design	Microsoft	Seattle	Washington	Northwest	60000 - 75000
101	90	regular	Staff Engineer	Embedded System	Apple Computers	N/A	N/A	Mountain	61000 - 61000
102	90	regular	Programmer Analyst	Marketing	Ford	Atlanta	N/A	Atlantic Coast	59000 - 79000
103	90	regular	Staff Engineer	Multimedia Application Development	Micron	N/A	N/A	Mountain	55000 - 61000
104	90	regular	Manager	Database Development	Micron	Des Moines Iowa	Middle	45000 - 51000	

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This is the end of the result.

Company Field: Here, we search for all the related companies of preferred company.

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• By region:

- All
- Atlantic Coast
- East
- Great Lakes

• By state:

- All
- Alabama
- Alaska
- Arizona

• By City:

- All
- Albuquerque
- Alexandria
- Allentown

Expected Salary: Any

Preferred company: Intel Motorola

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Job Search Results

(Total 51 matches)

Job Number	Rating	Job Type	Job Title	Special field	Company	City	State	Region	Salary Range
1	100	regular	Manager	Quality Control	Intel	San Jose	California	West	80000 - 88000
2	100	regular	Manager	Manufacturing	Intel	San Jose	California	West	80000 - 88000
3	100	regular	Engineer	Device	Intel	Reno	N/A	N/A	45000 - 53000
4	100	regular	Engineer	System Integration	Intel	Santa Fe	N/A	N/A	45000 - 55000
5	100	intern	Engineer	Windows Development	Intel	Portland	N/A	N/A	32000 - 40000
6	100	intern	Engineer	Process	Intel	Santa Fe	N/A	N/A	32000 - 40000
7	100	regular	Supervisor	Characterization	Intel	Portland	N/A	N/A	70000 - 78000
8	100	regular	Supervisor	Characterization	Intel	Portland	N/A	N/A	70000 - 78000
9	100	regular	Senior Analyst	E-Commerce Development	Intel	Portland	N/A	N/A	65000 - 98000
10	89	regular	Engineer	Test	Motorola	Dallas	Texas	N/A	60000 - 68000
11	89	regular	Engineer	Oracle Development	Motorola	Houston	Texas	N/A	55000 - 63000
12	89	regular	Engineer	Device	Motorola	Los Angeles	N/A	N/A	69000 - 77000
13	89	regular	Engineer	Process	Motorola	Phoenix	N/A	N/A	55000 - 63000
14	89	regular	Entry Level Engineer	UNIX System Programming	SUN Microsystems	Austin	Texas	N/A	56000 - 68000
15	89	regular	Engineer	Device	Motorola	San Diego	N/A	Pacific	60000 - 68000
16	89	intern	Engineer	Java Development	Apple Computers	Oakland	N/A	Pacific	56000 - 64000

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KeyWord Search:

ckw91-wcy14 Job Search x ckw91-wcy14 Job Search x +

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Job Search

** Select valid options instead of all in the following fields could give you more accurate matched and reduced amount of results.

Job Type: All

Job Title: All

Specialized field: All

If no fitful field is found, input your keyword here:

develop

Geophysical location:

- ☒ By region:
 - All
 - Atlantic Coast
 - East
 - Great Lakes
- ☐ By state:
 - All
 - Alabama
 - Alaska
 - Arizona
- ☐ By City:

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we updated the description column of company “Motorola” as “development of mobiles” to show the difference in jobratings between exact and partial match of keyword.

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Job Search Results

(Total 14 matches)

Job Number	Rating	Job Type	Job Title	Special field	Company	City	State	Region	Salary Range
1	100	entry level	Engineer	Windows Development	Microsoft	Santa Clara	N/A	N/A	40000 - 48000
2	100	entry level	Director	Engineering	Microsoft	San Jose	N/A	N/A	70000 - 90000
3	100	entry level	Engineer	Engineering	Microsoft	Atlanta	N/A	N/A	50000 - 65000
4	100	entry level	Engineer	Engineering	Microsoft	Atlanta	N/A	N/A	40000 - 65000
5	100	entry level	Analyst	Database Development	Microsoft	San Francisco	N/A	N/A	50000 - 70000
6	100	entry level	Senior Analyst	Web Development	Microsoft	Austin	N/A	N/A	60000 - 90000
7	100	entry level	Analyst	Digital Design	Microsoft	Seattle	Washington	Northwest	60000 - 75000
8	91	intern	Engineer	Accounting	Motorola	Austin	Texas	N/A	32000 - 40000
9	91	intern	Engineer	Device	Motorola	Austin	Texas	N/A	32000 - 40000
10	91	regular	Engineer	Test	Motorola	Dallas	Texas	N/A	60000 - 68000
11	91	regular	Engineer	Oracle Development	Motorola	Houston	Texas	N/A	55000 - 63000
12	91	regular	Engineer	Device	Motorola	Los Angeles	N/A	N/A	69000 - 77000
13	91	regular	Engineer	Process	Motorola	Phoenix	N/A	N/A	55000 - 63000
14	91	regular	Engineer	Device	Motorola	San Diego	N/A	Pacific	60000 - 68000

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This is the end of the result.

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** Select valid options instead of all in the following fields could give you more accurate matched and reduced amount of results.

Job Type:

Job Title:

Specialized field:

If no fitful field is found, input your keyword here:

Geophysical location:

- ☒ By region:

- Atlantic Coast
 - East
 - Great Lakes
- ☐ By state:

- Alabama
 - Alaska
 - Arizona
- ☐ By City:

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```

qstr=job_type=All&job_title=All&specialty=All&field_keyword=vehicles&location_type=region&min_salary=10000&company_name=All====
Database version: 11.2.0.1.0 Beginning of building sql_query_stmt job_type=All&job_title=All&specialty=All&field_keyword=vehicles&location_type=region&min_salary=10000&company_names=All ['job_type=all',
'job_title=all', 'specialty=all', 'field_keyword=vehicles', 'location_type=region', 'min_salary=10000', 'company_name=all']
self.stmt = SELECT * FROM job
Built statment = SELECT * FROM job
SELECT * FROM job

```

Job Search Results

(Total 2 matches)

Job Number	Rating	Job Type	Job Title	Special field	Company	City	State	Region	Salary Range
1	100	regular	Manager	UNIX System Programming	Ford	Chicago	N/A	N/A	60000 - 80000
2	100	regular	Programmer Analyst	Marketing	Ford	Atlanta	N/A	Atlantic Coast	59000 - 79000

(Page 1 of 1 pages)

This is the end of the result.

The word “vehicles” is part of description only for company ford.
Hence, only ford records are displayed.

Job Search

Featured companies:

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[Motorola](#)

** Select valid options instead of all in the following fields could give you more accurate matched and reduced amount of results.

Job Type:

Job Title:

Specialized field:

If no fitful field is found, input your keyword here:

Geophysical location:

- ☒ By region:
 -
 - Atlantic Coast
 - East
 - Great Lakes
- ☐ By state:
 -
 - Alabama
 - Alaska
 - Arizona
- ☐ By City:
 -
 - Albuquerque
 - Alexandria
 - Allentown

Expected Salary:

Preferred company:

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```
qstr=job_type=All&job_title=All&specialty=All&field_keyword=develop&location_type=region&min_salary=10000&company_name=All====
Database version: 11.2.0.1.0 Beginning of building sql_query_stmt job_type=All&job_title=All&specialty=All&field_keyword=develop&location_type=region&min_salary=10000&company_name=All ['job_type=all',
'job_title=all', 'specialty=all', 'field_keyword=develop', 'location_type=region', 'min_salary=10000', 'company_name=all']
self.stmt = SELECT * FROM job
Built statment = SELECT * FROM job
develop SELECT * FROM job
```

Job Search Results

(Total 14 matches)

Job Number	Rating	Job Type	Job Title	Special field	Company	City	State	Region	Salary Range
1	100	entry level	Engineer	Windows Development	Microsoft	Santa Clara	N/A	N/A	40000 - 48000
2	100	entry level	Director	Engineering	Microsoft	San Jose	N/A	N/A	70000 - 90000
3	100	entry level	Engineer	Engineering	Microsoft	Atlanta	N/A	N/A	50000 - 65000
4	100	entry level	Engineer	Engineering	Microsoft	Atlanta	N/A	N/A	40000 - 65000
5	100	entry level	Analyst	Database Development	Microsoft	San Francisco	N/A	N/A	50000 - 70000
6	100	entry level	Senior Analyst	Web Development	Microsoft	Austin	N/A	N/A	60000 - 90000
7	100	entry level	Analyst	Digital Design	Microsoft	Seattle	Washington	Northwest	60000 - 75000
8	91	intern	Engineer	Accounting	Motorola	Austin	Texas	N/A	32000 - 40000
9	91	intern	Engineer	Device	Motorola	Austin	Texas	N/A	32000 - 40000
10	91	regular	Engineer	Test	Motorola	Dallas	Texas	N/A	60000 - 68000
11	91	regular	Engineer	Oracle Development	Motorola	Houston	Texas	N/A	55000 - 63000
12	91	regular	Engineer	Device	Motorola	Los Angeles	N/A	N/A	69000 - 77000
13	91	regular	Engineer	Process	Motorola	Phoenix	N/A	N/A	55000 - 63000
14	91	regular	Engineer	Device	Motorola	San Diego	N/A	Pacific	60000 - 68000

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This is the end of the result.

**THANK
YOU!**