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Automatic Jobs Candidates Selection System (AJCSS)
(Design)

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Abstract:

This design document shows the architectural design of the AJCSS. It contains graphical representation about classes and functions, and the representation of requirements is shown in a way that reflects the purpose of the system. Also, it gives an example of how the software will be like.

1. Introduction

Here we will give a scope description of everything included in this document.

AJCSS is an Automatic Jobs Candidates Selection System. AJCSS software will allow users to store vacant jobs' and jobs' seekers data(candidates). It also allows users to apply matching process between jobs and candidates and generate a report of the matched candidates. AJCSS will not perform hiring or recruitment process. AJCSS will automate the selection of the most suitable unprocessed candidates for a vacant job. It will reduce the time and cost the manual process. It will save HR managers and members time and provide what is so-called recruitment's equal opportunity. AJCSS will allow users to apply a matching criterion based on the comparable attributes of jobs and candidates. Such criteria will consider multiple attributes for matching from different data types and values (integers and Boolean values). The criteria will apply exact matching between some attributes and inexact between some others. If exact match failed then no matching found, where in the inexact case, a match is found if attribute's value of a candidate is greater than or equal to the same attribute's value of a job. The matching process will aggregate the exact and inexact matches as a value of 10 points per attribute. Exact match is either 0 or 10 points while inexact is a range from 0 to 10. Boolean attributes are preferences and will not affect the matching process. The result of the matching process will produce a list of matched candidates -if exists- sorted by the highest aggregated percentage of a matched candidate. The matched list will be sent as a report to the HR manager. The status of the selected job for matching will be updated as occupied and the status of the matched candidates will be updated as processed. Regarding the progress that has been made since the SRS document, we have been designing the graphical user interface (GUI) of the application. As well the system model design and the architectural pattern.

2. High Level and Medium Level Design

2.1 System Level Diagram

The system level diagrams are: system's interaction model (Use-case diagram) and system's architectural pattern (pipe and filter pattern).

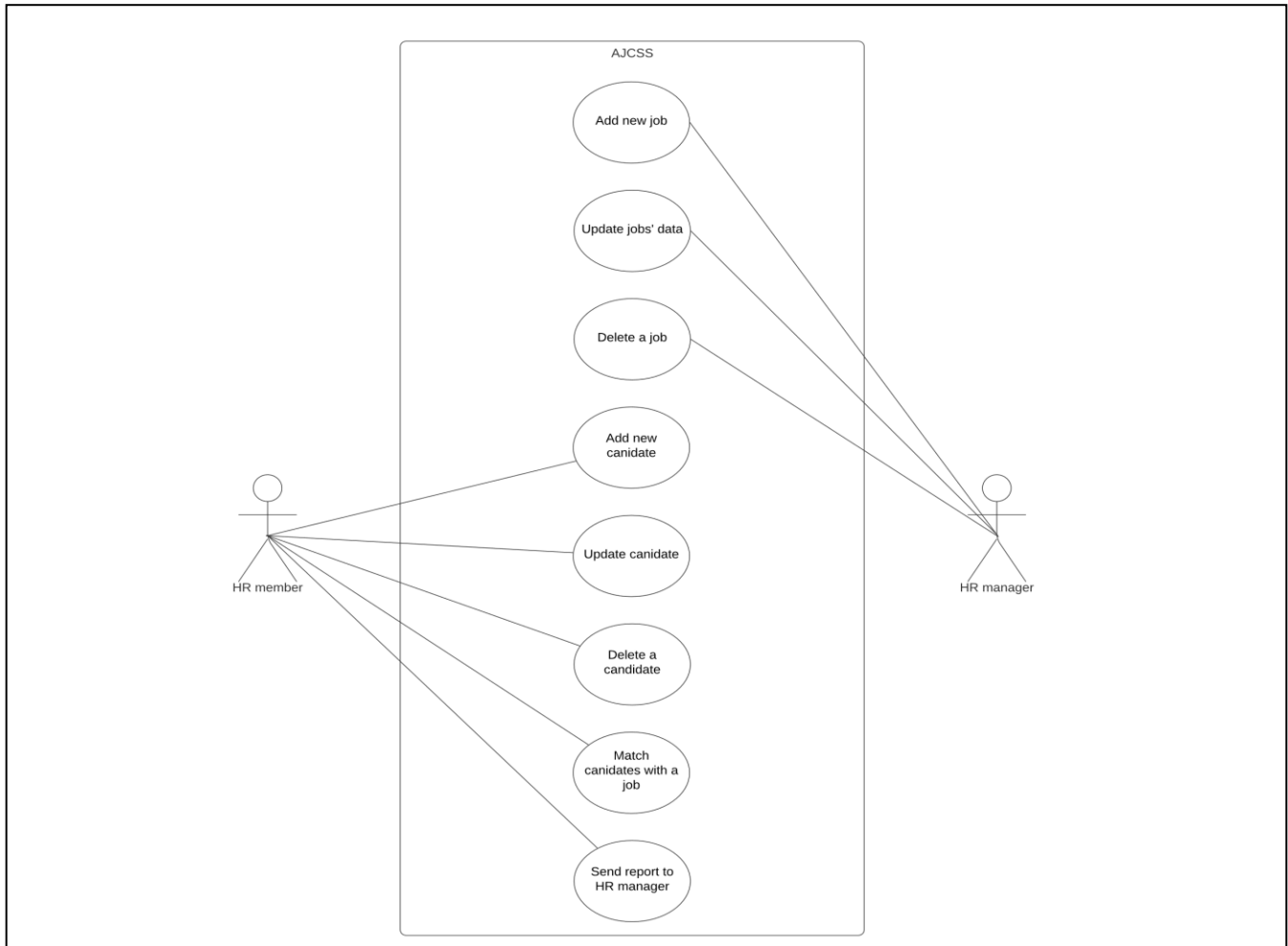


Fig. 1 Use case diagram that depicts the use cases of HR manger and member actors.

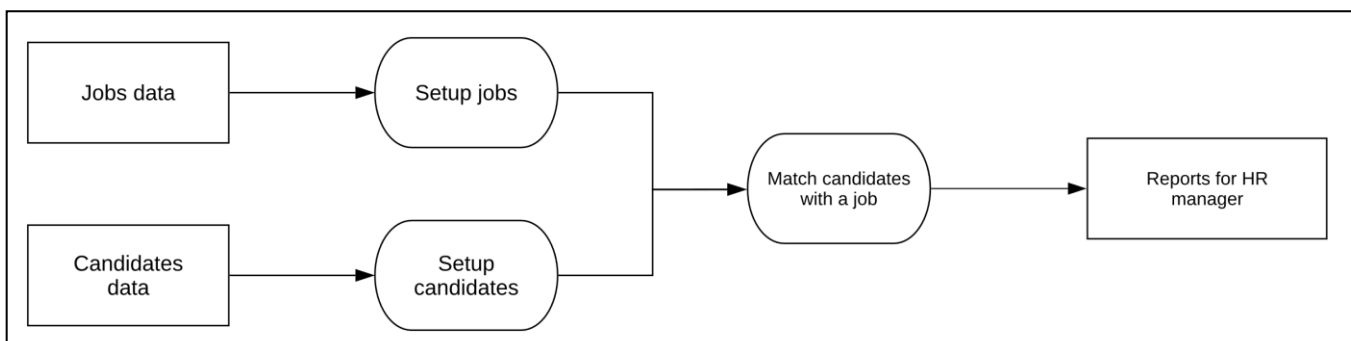


Fig. 2 pipe and filter pattern that depicts the data flow to the process of finding a match.

2.2 Class Diagram

The class diagram shows the structure and relationships of AJCSS software.

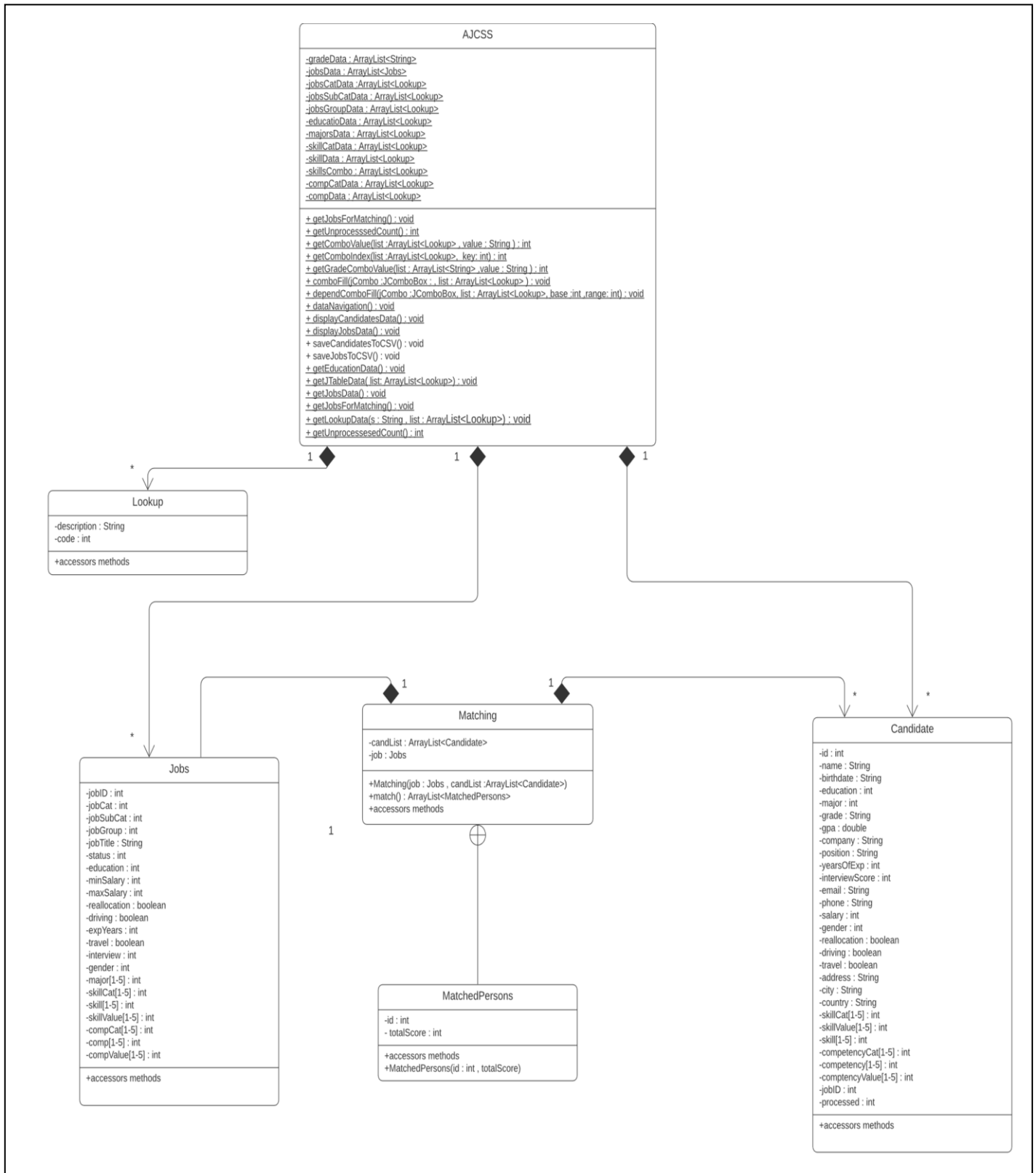


Fig. 3 AJCSS class diagram

2.3 Class Method Descriptions

AJCSS

The AJCSS class is main class which has the graphical user interface (GUI) components, the methods that initializes all the data and fills the GUI components when the program starts. Also, it has methods which save the progress into CSV files.

Class	AJCSS
Method	getUnprocessedCount
Visibility	Public
Return type	Int
Parameter, types	None
Description	This method counts how many unprocessed candidates are there.

Class	AJCSS
Method	getComboValue
Visibility	Public
Return type	Int
Parameter, types	list : ArrayList<Lookup> , value : String
Description	This method gets the value of the selected item in a combo box.

Class	AJCSS
Method	getComboIndex
Visibility	Public
Return type	Int
Parameter, types	list : ArrayList<Lookup> , key : int
Description	This Method gets the index of the selected item in a combo box.

Class	AJCSS
Method	comboFill
Visibility	Public
Return type	void
Parameter, types	jCombo : JComboBox , list : ArrayList<Lookup>
Description	This method fills a combo box from an arraylist.

Class	AJCSS
Method	dataInitialization
Visibility	Public
Return type	void
Parameter, types	none
Description	This method initializes all the data at the start of the program from CSV files.

Class	AJCSS
Method	getJobsData
Visibility	Public
Return type	void
Parameter, types	none
Description	This method fetches the jobs data from CSV file. Then stores the fetched data into an arraylist in program.

Class	AJCSS
Method	getLookupData
Visibility	Public
Return type	void
Parameter, types	s : String , list : ArrayList<Lookup>
Description	This method fetches the lookup data from CSV file. Then stores the fetched data into an arraylist in program.

Class	AJCSS
Method	SaveCandidatesToCSV
Visibility	Public
Return type	void
Parameter, types	none
Description	This method saves the candidate's data into a CSV file.

Class	AJCSS
Method	SaveJobsToCSV
Visibility	Public
Return type	void
Parameter, types	none
Description	This method saves the job's data into a CSV file.

Matching

This Matching class is designed to process the matching of the selection criteria by using a method which finds a match for unprocessed candidates with a vacant job.

Class	Matching
Method	match
Visibility	Public
Return type	ArrayList<MatchedPersons>
Parameter, types	none
Description	This method looks for a match between selected unprocessed candidates and a vacant job.

Jobs

The Jobs class is designed to store jobs' data that contains essential data for processing. As well update a job's data. This class contains accessors methods.

Lookup

The Lookup class is designed to reference jobs' data to coded values. A job's data is written with a description; thus, it will reference the job's data description to a coded integer value to ease the operation and process. This class contains accessors methods.

Candidate

The Candidate class is designed to store candidates' data that contains essential data for processing. As well update a candidate's data. This class contains accessors methods.

3. Detailed Design

This section contains diagrams depicting low-level details of pieces of the AJCSS software.

Figure 4 depicts an activity chart at the start of the program. Activity includes loading the files into the program, storing data in program data structures, selecting user type, sending reports and storing data into files.

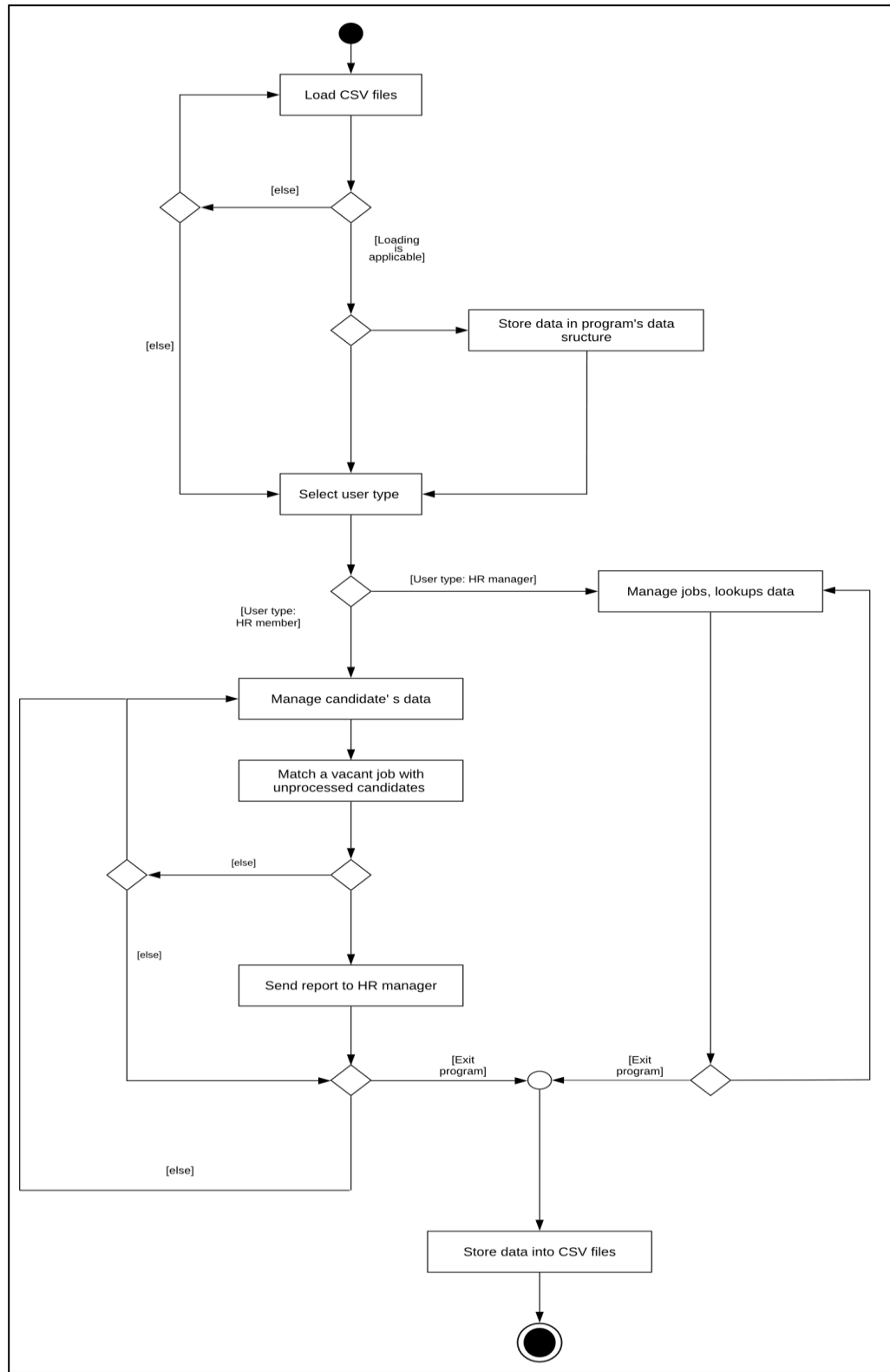


Fig. 4 AJCSS activity chart

Figure 5 is a flowchart showing the method `Matching:match()` which finds a match for unprocessed candidates with a vacant job.

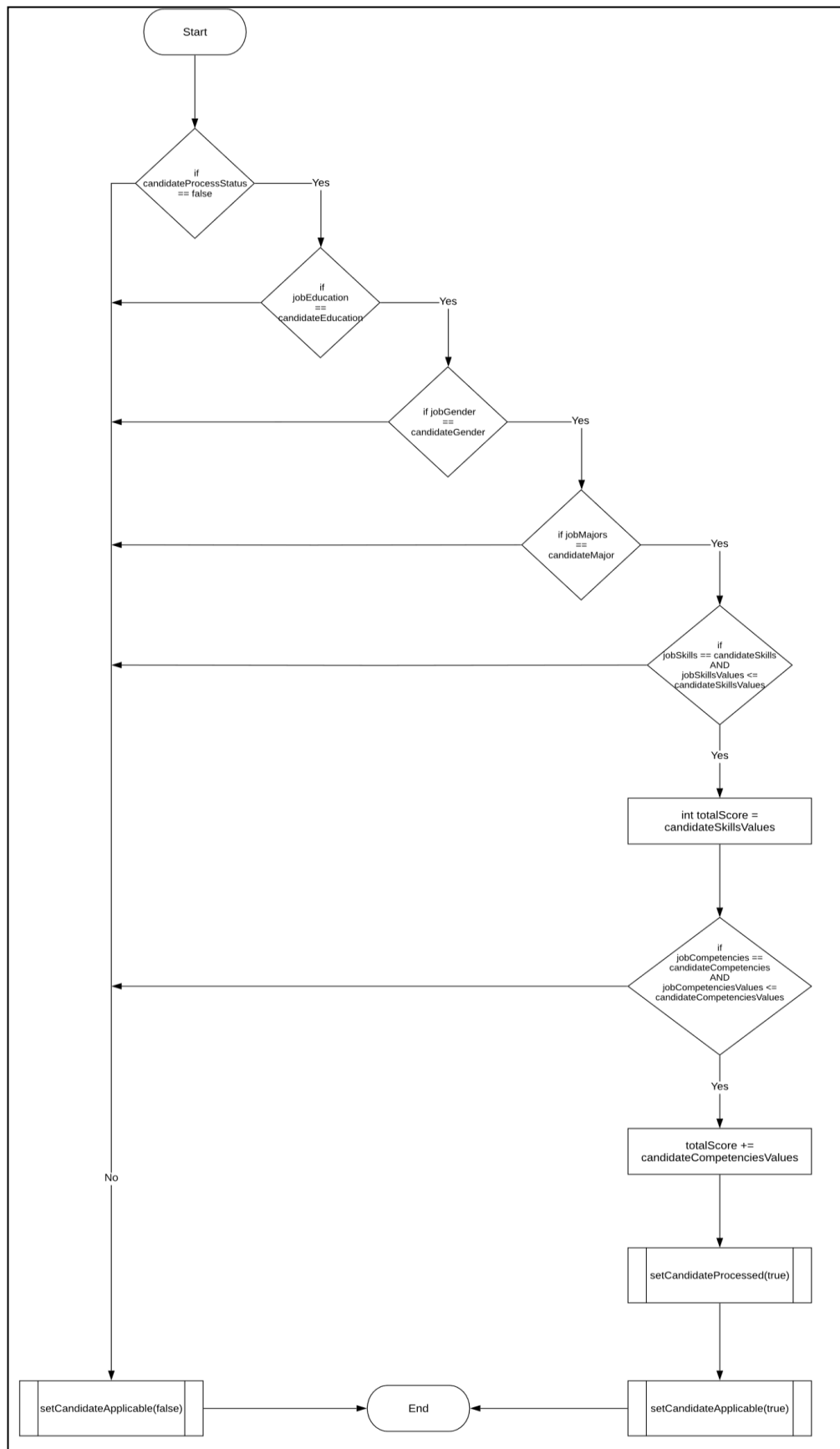


Fig. 5 The `match()` method from the Matching class.

4. User Interface Design

This section contains screen shots of initial versions for the AJCSS user interface.

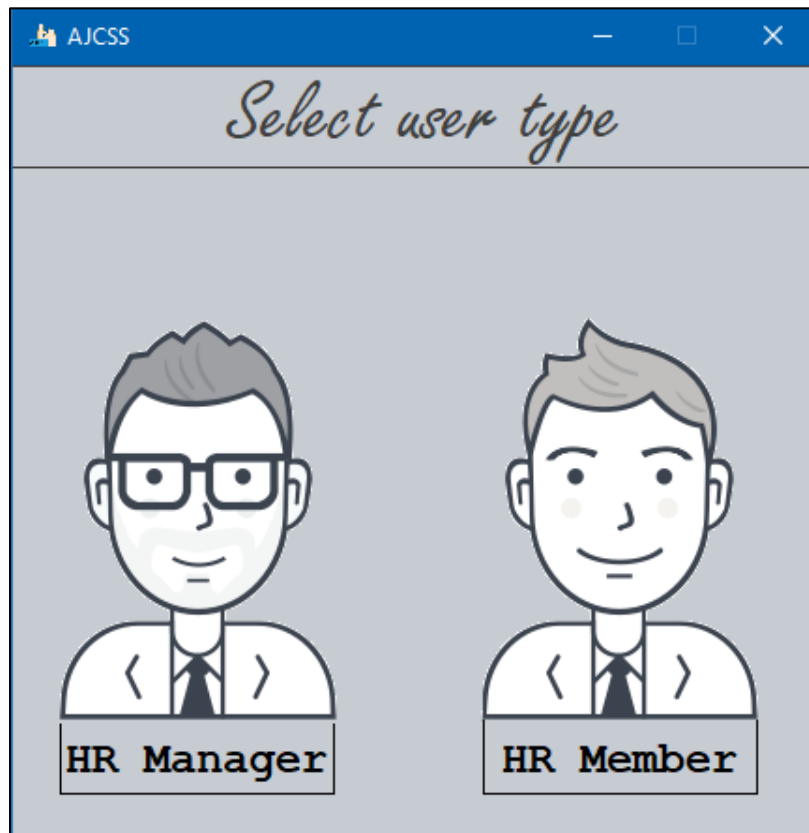


Fig. 6 This window lets you select the user type.

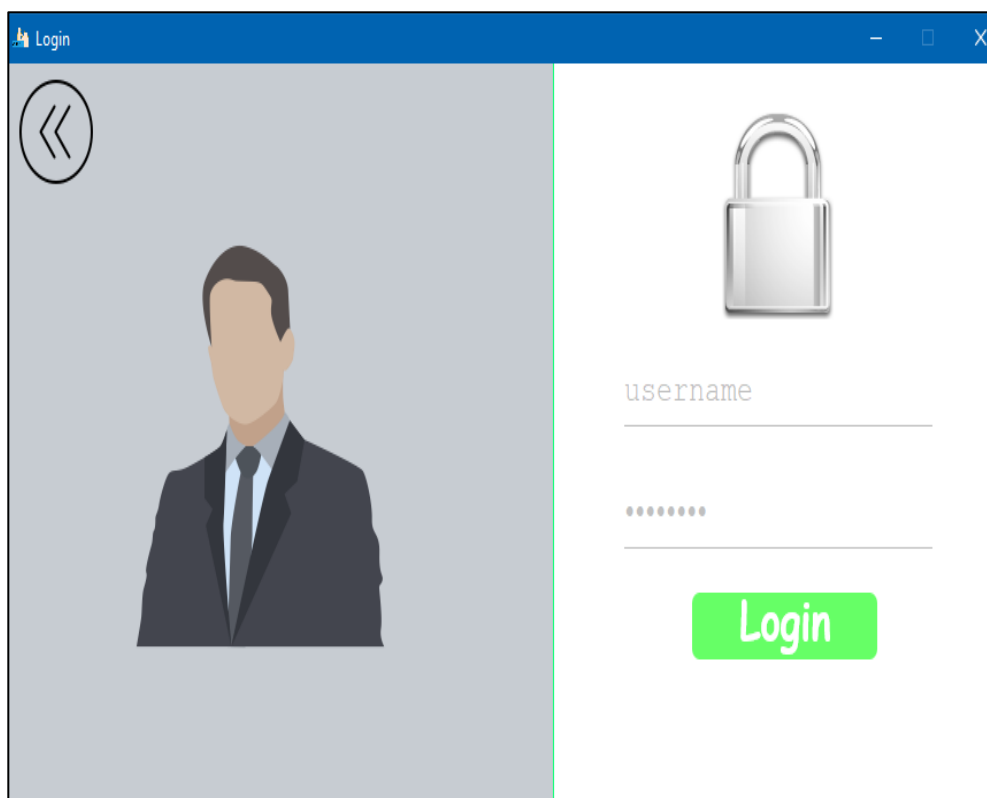


Fig. 7 This window is for HR manager user type which asks for admin credentials.

Jobs					Candidates	Lookups	Exit & save	Matching
New Job					Vacant Jobs	All Jobs		
job ID					Add			
job category	management							
sub category	Chief executives, senior officials a...							
job title								
Interview score	0							
min salary	0							
max salary	0							
years of experience	0							
specializations								
Major 1	legislation							
Major 2	legislation							
Major 3	legislation							
Major 4	legislation							
Major 5	legislation							
re-allocation	<input type="checkbox"/> Yes							
driving license	<input type="checkbox"/> Yes							
travelling	<input type="checkbox"/> Yes							
					required skills			
					skills category	skill	minimum required value	
					Office and Admini...	Office and Admini...	0	
					Office and Admini...	Office and Admini...	0	
					Office and Admini...	Office and Admini...	0	
					Office and Admini...	Office and Admini...	0	
					Office and Admini...	Office and Admini...	0	
					required competencies			
					competency category	competency	minimum required value	
					academic	Knowledge of ac...	0	
					academic	Knowledge of ac...	0	
					academic	Knowledge of ac...	0	
					academic	Knowledge of ac...	0	
					academic	Knowledge of ac...	0	

Fig. 8 A screen shot of the jobs-new job section which let you setup a new job.

Jobs					Candidates	Lookups	Exit & save	Matching
New Job					Vacant Jobs	All Jobs		
job ID	111				Prev Next			
job category	Service and sales workers				Update			
sub category	Chief executives, senior officials a...							
Education level	higher diploma							
job title	programmer							
Interview score	3							
min salary	1000							
max salary	10000							
years of experience	3							
specializations								
Major 1	Administrative and commercial							
Major 2	production management							
Major 3	Hospitality, retail and other services							
Major 4	Business and administration							
Major 5	Science and engineering							
re-allocation	<input checked="" type="checkbox"/> Yes							
driving license	<input type="checkbox"/> Yes							
travelling	<input checked="" type="checkbox"/> Yes							
					required skills			
					skills category	skill	minimum required value	
					IT Jobs	Office and Admini...	5	
					General Manage...	CRM Software (S...	4	
					General Manage...	Electronic Medica...	3	
					Advertising and M...	Social Media Mar...	4	
					IT Jobs	Computer Skills	3	
					required competencies			
					competency category	competency	minimum required value	
					leadership	Knowledge of car...	3	
					information techn...	Knowledge of em...	6	
					public safety	Claim investigati...	6	
					information techn...	Knowledge of a v...	4	
					helath care	Knowledge of ad...	3	

Fig. 9 A screen shot of the jobs-vacant jobs section which shows you all vacant jobs.

JobsCandidatesLookupsExit & saveMatching

New CandidateUnprocessed CandidatesAll Candidates

candidate ID

name

birth date

education level

none

major

legislation

grade

Pass

GPA

current comp...

current position

experience ye...

expected salary

interview score

0

gender

male

Male

Female

address

city

country

phine

email

reallocation

Add

have driving license

travelling

skills categories

Office and Administr...

Office and Administr...

Office and Administr...

Office and Administr...

Office and Administr...

skills

Office and Administr...

Office and Administr...

Office and Administr...

Office and Administr...

Office and Administr...

skills value

0

0

0

0

0

competency categories

academic

academic

academic

academic

academic

competency

Knowledge of acad...

Knowledge of acad...

Knowledge of acad...

Knowledge of acad...

Knowledge of acad...

cometency value

0

0

0

0

0

Fig. 10 A screen shot of the candidates- new candidate section which lets you setup the a new candidate.

JobsCandidatesLookupsExit & saveMatching

New CandidateUnprocessed CandidatesAll Candidates

candidate ID

1111111

name

abdulaziz

birth date

1/1/2000

education level

higher diploma

major

Administrative and commercial

grade

Good

GPA

3.88

current comp...

CCC

current position

programmer

experience ye...

5

expected salary

20000

interview score

6

gender

male

Male

Female

address

assahafah

city

abha

country

saudia

phine

055555555

email

dasser@gmail.com

reallocation

prev

next

have driving license

update

travelling

skills categories

IT Jobs

*Sales, Retail, and C...

Nursing and Healthc...

IT Jobs

Engineering & Techn...

skills

Front-End & Back-En...

CRM Software (Sale...

Electronic Medical R...

Social Media Market...

Computer Skills

skills value

7

5

7

9

10

competency categories

academic

auditing

business

communications

development

competency

Knowledge of career ...

Knowledge of emplo...

Claim investigation p...

Knowledge of a varie...

Knowledge of adult L...

cometency value

5

8

7

6

5

Fig. 11 A screen shot of the candidates- unprocessed candidate section which shows you all unprocessed candidates.

Jobs
Candidates
Lookups
Exit & save
Matching

Select a lookup:
Majors
0

code	Description
1100	legislation
1200	Administrative and commercial
1300	production management
1400	Hospitality, retail and other services
2100	Science and engineering
2200	Health professionals
2300	TeachingA professionals
2400	Business and administration
2500	Information and communications technology
2600	Legal, social and cultural
3100	Science and engineering associate
3200	Health associate
3300	Business and administration associate
3400	Legal, social, cultural and related associate
3500	Information and communications technicians
4100	General and keyboard
4200	Customer services
4300	Numerical and material recording
4400	Other clerical support
5100	Personal service
5200	Sales works
5300	Personal care works
5400	Protective services works
6100	Market-oriented skilled agricultural works
6200	Market-oriented skilled forestry, fishery and hunting works

Code
1300

Description
production management

Add
Update

Fig. 12 A screen shot of the lookups section which shows you all lookups that were loaded from CSV file.

Jobs
Candidates
Lookups
Exit & save
Matching

Front-End & Back-End Development

5

CRM Software (Salesforce, Hubspot, Zoho, Freshsales)

4

Electronic Medical Record (EMR)

3

Social Media Marketing and Paid Social Media Advertising

4

Computer Skills

3

skills total points

19

Seq	Joob ID	Job Title
0	111	programmer
1	222	bank manager
2	333	programmer

leadership

3

information technology

6

public safty

6

information technology

4

helath care

3

competencies total points

22

0

Match

skill	Score
Front-End & Back-End Development	7
CRM Software (Salesforce, Hubspot, Zoho, Freshsales)	5
Electronic Medical Record (EMR)	7
Social Media Marketing and Paid Social Media Advertising	9
Computer Skills	10

Seq	candidate ID	Total Score	Score perc...
0	1111111	99	76%
1	3333333	36	28%
2	4444444	49	38%

competency	Score
Knowledge of career development and counseling to give c...	5
Knowledge of employment laws in order to interpret and tak...	8
Claim investigation procedures to determine damage, liabil...	7
Knowledge of a variety of formats, styles, and techniques for...	6
Knowledge of adult learning theory	5

Candidate's skills total points

38

+ 30 +

Candidate's competencies total points

31

confirm selection, send list by mail to HR mama...

Fig. 13 A screen shot of the matching section which lets you select unprocessed candidates to match them with a vacant job.

5. Conclusion

In the design document we gave a brief visualization about the AJCSS software, we have clarified the process using high level and medium level design that involve the system level diagram and class diagram. Also, we have specified back-end infrastructure for the AJCSS software, using the detailed design that involves activity chart and flowchart. Finally, we have shown the expected AJCSS graphical user interface in the user interface design section.