Automated Project Allocation System (APAS)

Software Engineering Project II – COMP3006L

Interim Report

Team – 6droids

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1. Introduction

"APAS" is a software solution which will help the user to assign projects to students. To proceed with the system the user has to input a spread sheet with a list of names and preferred projects and then the system will randomly assign projects to each students depending on the weight each of them gained after processing through the algorithm.

When the system start assigning a project to a candidate, the algorithm will check the preferred project list of each candidate and will give the priority to that list (valid mapping). When the system randomly assign projects to candidates, the algorithm will select the item from the most preferred list before going in to other project names. To perform this randomizing part, the system will use one from following algorithms (best mapping).

- Simulated annealing
- Genetic Algorithm

When the system is done performing one of above mentioned algorithms, it will give a status report to the user about the project allocation.

2. Project Description

2.1. Requirements (Development)

Programming language – Java

Java is a general-purpose computer programming language that is concurrent, class-based, object-oriented, and specifically designed to have as few implementation dependencies as possible. It is intended to let application developers "write once, run anywhere" (WORA), meaning that compiled Java code can run on all platforms that support Java without the need for recompilation.

Source – Wikipedia

IDE – NetBeans

NetBeans is a software development platform written in Java. The NetBeans Platform allows applications to be developed from a set of modular software components called modules. Applications based on the NetBeans Platform, including the NetBeans integrated development environment (IDE), can be extended by third party developers.

Source – Wikipedia

2.2. Requirements (Implementation)

To get a proper output by implementing the system, the user has to have following data in a spreadsheet in the following order.

Student Name	Prearranged	Preference 1	Preference 2	Preference 3	Preference 4	Preference 5	Preference 6	Preference 7	Preference 8	Preference 9	Preference 10
Loki Laufeyson	No	3D printing and augmented reality systems in novel vascular models	3D stereolithographic models placed in virtual reality as an assist in preoperative planning	Building a 3D room from a Kinect carrying Drone	Drone based re-establishment of communications for humanitarian rescue organisations	Automatic landmark extraction from geo-located flickr images	Mobile and Crowdsourced Community Activism	Forensic Analysis of P2P Instant Messaging	Agent Organisations in ASTRA	Recommending Movies Using Curated IMDb Lists	Twitter Network Analysis
Richard B. Riddick	No	A GUI approach to learning how computer networks work	Hebbian Learning in BasicProp	Echo State Network within BasicProp	NS-3 visisalisation tool for SUMO generated traffic	Literature Review Assistant	Automatic landmark extraction from geo-located flickr images	Analysis of urban street networks - constructing a dual representation	Markson's Memory	Methodological Support for Astra	SDN Controller GUI: a mouse based OpenFlow controller

3. Project Design

3.1. Problems and Solutions

Problem	Solution
How to manage students in a HashTable	• Student ID was maintained separately • Projects were maintained separately so there won't be any duplicates
How to manage current and previous projects in the randomizeAssignment() function	Using a stack
How to obtain fitness() function of students	Fitness is inversely proportional to the energy

3.2. Daily/Weekly Scrum Note

Documenting every meeting made our work much easier and efficient. On days we were unable to meet were discussed via Skype and Viber to make it more effective.

Weekly Reports

Weekly meetings were one of the main tasks of the project. In these meetings we discussed about each member updates during the particular week and their contribution toward the project. So each team member is fully aware about the progress of the project and their contribution to the project. These meetings help us to understand our responsibilities. After the meeting we document a summary of the each meeting. Our meeting were held according to this plan.

- **What's been accomplished since the last meeting?**
  At this stage we discussed about what team members accomplished for the past week and how they achieved them. We understood many useful things through this process by discussing those achievements. Meantime weekly meeting spreadsheets were updated with meeting notes and some of them were difficulties we faced and errors needed attention.

- **What needs to be done before the next meeting?**
  In this stage whole team discussed about the changes required, improvements need to be done for assigned tasks to run the project smoothly.

- **What obstacles are in the way?**
  Here we mainly discussed about strategies and solutions for the obstacles we had during the week and solutions needed to minimize the turnaround time to clear those obstacles.

Meeting Date	Meeting Time	Venue	Discussion
16.06.2016	Break during the lecture	NSBM Auditorium	This is the first meeting, so we discussed about following things. • R&D • Weekly meeting structure • Chose a suitable IDE, UI layout • Identified resources for each role

19.06.2016	1600 - 1800	NSBM Study Area	This is the weekly meeting for (17.06.2016 – 18.06.2016)
			• Discussed about everyone's finding on the given tasks.
			• Check for dependencies of each task and implement a schedule
			• Assigned new tasks for the team
			   o Flowcharts, WBS, Wireframe designing
			   o Mock UI
			   o R & D further more

25.06.2016	1000-1700	NSBM Study Area	This is the weekly meeting for (20.06.2016 – 24.06.2016) • Flowcharts, WBS, Wireframe designing reviewed and finalized by the team. • Modified UI • Checked the Interim report up to date

3.3. Team Roles

Task	Assigned Persons	Follow up
Team Leader	Tharkana	
Report Writers	Poorni / Namal	Kavindu
UI Designers	Nelanga / Kavindu	Team
Developers	Tharkana / Priyanga / Kavindu	
QA	Poorni / Namal / Nelanga	Team

3.4. Gantt chart

Project Allocation to Students — timeline: 6/6/2016 — 18 — 7/17/2016

Main T#	Sub T#	Task	Assigned person	Start date	#RemD	Due date	Progress
1		Project Managmnet		6/6/2016	0.00	6/17/2016	98.50%
	1.1	Assign key Roles	All	6/6/2016	0.00	6/12/2016	100.00%
	1.2	Project Plan	All	6/10/2016	0.00	6/17/2016	97.00%
2		Research & Development		6/13/2016	0.00	6/17/2016	96.50%
	2.1	Select Dev Tools,IDEs ...	All	6/13/2016	0.00	6/15/2016	98.00%
	2.2	Select best GUI libraries	Dev Team	6/16/2016	0.00	6/17/2016	95.00%
3		Requirement Analysis		6/18/2016	0.00	6/25/2016	90.00%
	3.1	WBS	Srima1	6/18/2016	0.00	6/23/2016	100.00%
	3.2	Project Gantt Chart	Srima1	6/22/2016	0.00	6/25/2016	70.00%
	3.3	Dev. Plan	Dev Team	6/22/2016	0.00	6/25/2016	100.00%
4		UI,UX & Prototyping		6/23/2016	0.00	6/27/2016	66.67%
	4.1	Wireframes	Nelanga	6/23/2016	0.00	6/25/2016	100.00%
	4.2	High Fidelity	Nelanga	6/26/2016	0.00	6/27/2016	0.00%
	4.3	UX & UI Review1	All	6/27/2016	0.00	6/27/2016	100.00%
5		Architecture		6/23/2016	4.00	7/3/2016	30.00%
	5.1	Flow Charts	Tharkana	6/23/2016	0.00	6/27/2016	100.00%
	5.2	Class Diagram	Nama1	6/27/2016	2.00	7/1/2016	20.00%
	5.3	High Level	Srima1	7/1/2016	4.00	7/3/2016	0.00%

		Architecture						
	5.4	UI Designings	Nelanga	6/30/2016	4.00	7/3/2016	0.00%	
6		Development		6/30/2016	12.00	7/11/2016	0.00%	
	6.1	File Handling	Namal	6/30/2016	2.00	7/1/2016	0.00%	
	6.2	Develop Basic mapping	Kawindu	7/1/2016	4.00	7/3/2016	0.00%	
	6.3	Implement Simulated Annealing (SA)	Srimal	7/4/2016	8.00	7/7/2016	0.00%	
	6.4	Implement Genetic Algorithm (GA)	Tharkana	7/4/2016	8.00	7/7/2016	0.00%	
	6.5	Define Invalid mappings	Kawindu	7/6/2016	9.00	7/8/2016	0.00%	
	6.6	SA Solution & Report Validity	Srimal	7/8/2016	11.00	7/10/2016	0.00%	
	6.7	GA Solution & Report Validity	Tharkana	7/8/2016	11.00	7/10/2016	0.00%	
	6.8	Bug Resolving	Dev Team	7/12/2016	12.00	7/12/2016	0.00%	
7		QA		7/10/2016	16.00	7/15/2016	0.00%	
	7.1	Create Test Scenario	Namal	7/10/2016	12.00	7/11/2016	0.00%	
	7.2	Unit Testing	Nelanga	7/12/2016	14.00	7/13/2016	0.00%	
	7.3	Component Testing	Namal	7/13/2016	15.00	7/14/2016	0.00%	
	7.4	Integration Testing	Poorni	7/14/2016	15.00	7/14/2016	0.00%	
	7.5	User Testing	All	7/15/2016	16.00	7/15/2016	0.00%	
8		Documentation		6/15/2016	18.00	7/17/2016	48.21%	
	8.1	Daily Scrum Notes	Poorni	6/15/2016	18.00	7/17/2016	42.86%	
	8.2	Weekly Report	poorni	6/20/2016	18.00	7/17/2016	50.00%	

8.3	Interim Report	All	6/27/2016	0.00	6/29/2016	100.00%			
8.4	Final Report	All	7/15/2016	18.00	7/17/2016	0.00%			
9	Submition	All	7/17/2016	18.00	7/17/2016	0.00%			

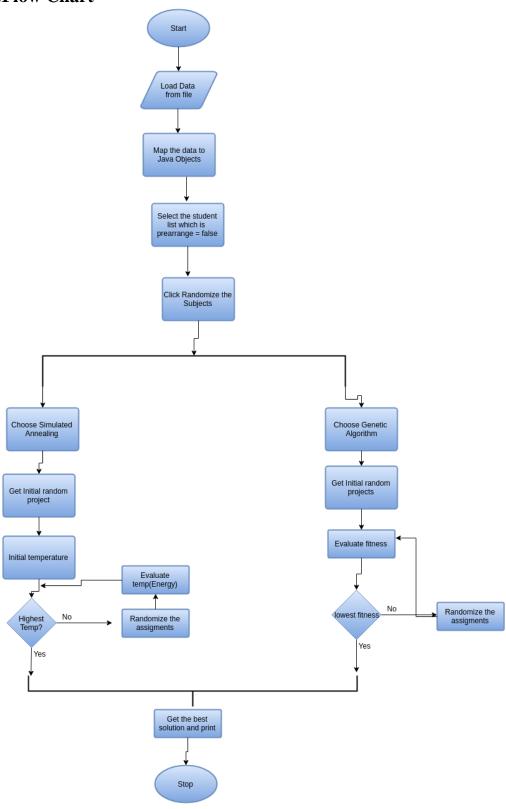| Legend	
Main Task Progress	
Daily Scrum	
Sub Task Timeline	

See more - https://goo.gl/J9aAwI

3.5. Work break-down structure

See more - https://goo.gl/nOQ5ec

3.6.Flow Chart

```
                              ( Start )
                                 |
                                 v
                         / Load Data    /
                        /  from file   /
                                 |
                                 v
                        [ Map the data to
                          Java Objects ]
                                 |
                                 v
                        [ Select the student
                          list which is
                          prearrange = false ]
                                 |
                                 v
                        [ Click Randomize the
                          Subjects ]
                                 |
              +------------------+------------------+
              |                                     |
              v                                     v
     [ Choose Simulated                    [ Choose Genetic
       Annealing ]                           Algorithm ]
              |                                     |
              v                                     v
     [ Get Initial random                 [ Get Initial random
       project ]                            projects ]
              |                                     |
              v                                     v
     [ Initial temperature ]              [ Evaluate fitness ] <----+
              |          [ Evaluate               |                 |
              |            temp(Energy) ]          |                 |
              |              ^                     |                 |
              v              |                     v                 |
          < Highest > --No--> [ Randomize the   < lowest fitness > --No--> [ Randomize the
            Temp?              assigments ]                                   assigments ]
              |                                     |
             Yes                                   Yes
              |                                     |
              +------------------+------------------+
                                 v
                        [ Get the best
                          solution and print ]
                                 |
                                 v
                            ( Stop )
```
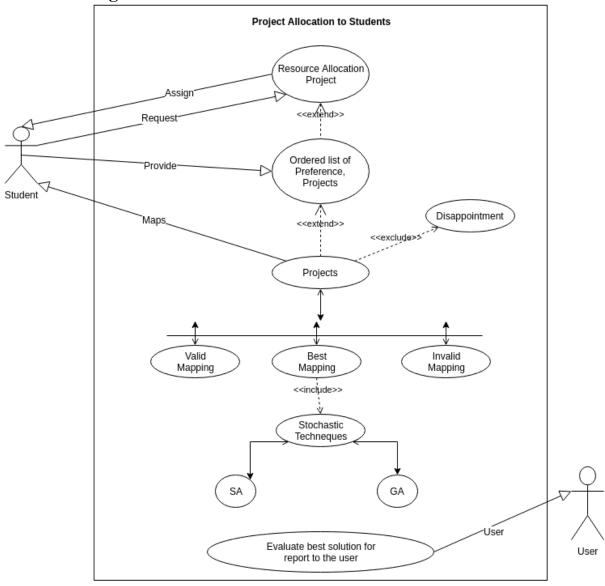
See more - https://goo.gl/oz7pCl

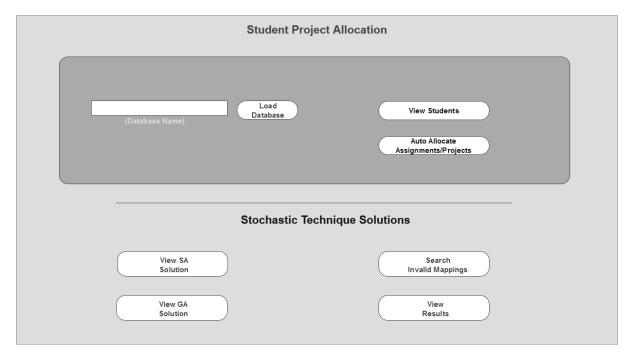## 3.7.Use-case Diagram

See more - https://goo.gl/94Ub7Q

3.8. Mock User Interfaces

Figure 1 – Home

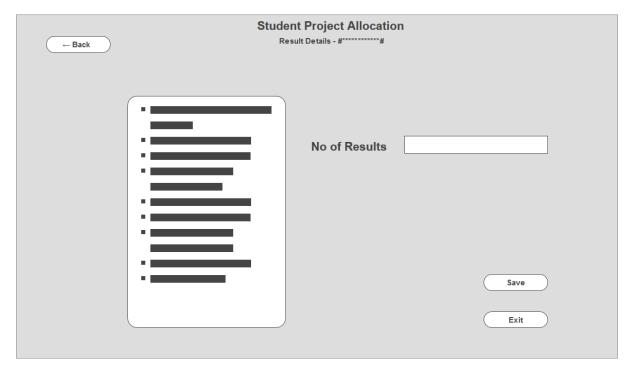*Figure 2 - Results*