CHAPTER V
IMPLEMENTATION AND TESTING

5.1. Implementation

5.1.1. City Setting

First, to start doing the process of finding route using both algorithms, user needs to configure which cities that will be visited. In order to start configure city, click the menu "Saved City List" like below:

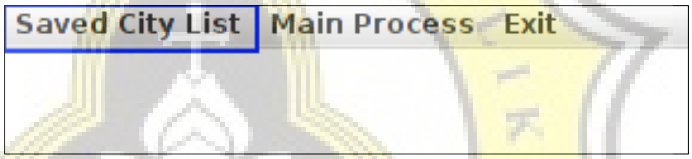

Figure 7. Saved City List menu position

After clicking Saved City List menu above, the menu will appear more like below.

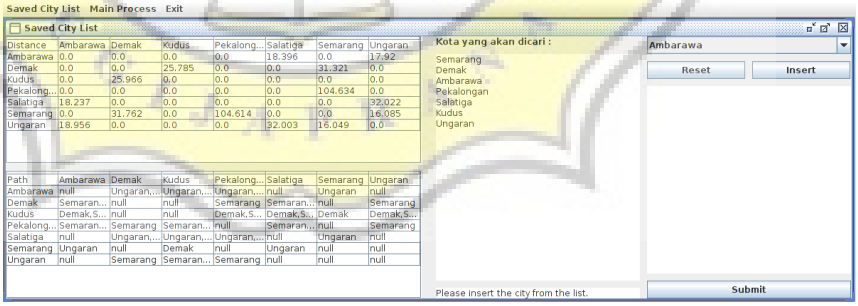

Figure 8. Interface of Saved City List menu

In the left side of Saved City List dialog box, there is saved distance and path data. In the center of dialog box there are text area that contains city that will be processed by both algorithms. And at the right side of dialog box, there

are combo box that will let user choose which city that will be visited.

In order to insert the cities, choose the option on combo box at right side. After choosing one of the cities, click the button Insert to fill the text area below combo box.

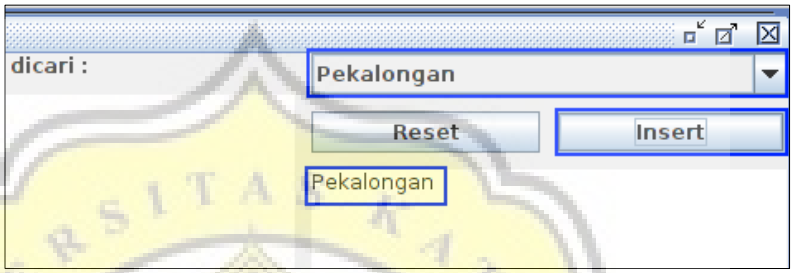

Figure 9. Interface after inserting city

When having the wrong choice in choosing the cities, then it can be reset all over, by clicking the button Reset. The position of reset button are located at the left side of insert button.

Then after done choosing the multiple city, click button Submit to insert chosen cities inside the program. The result of the execution will be like this.

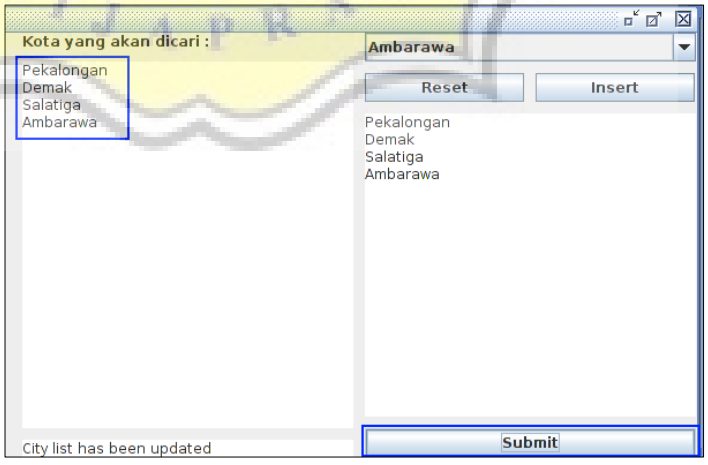

Figure 11. Result of updating inserted cities

When finished submitting chosen cities, city setting will be finished and ready to be execute with both algorithms.

5.1.2. Starting Main Process

After done configuring city setting, then program can be started by opening the main process dialog box. In order to open the dialog box, click the menu Main Process to open dialog box of the process.

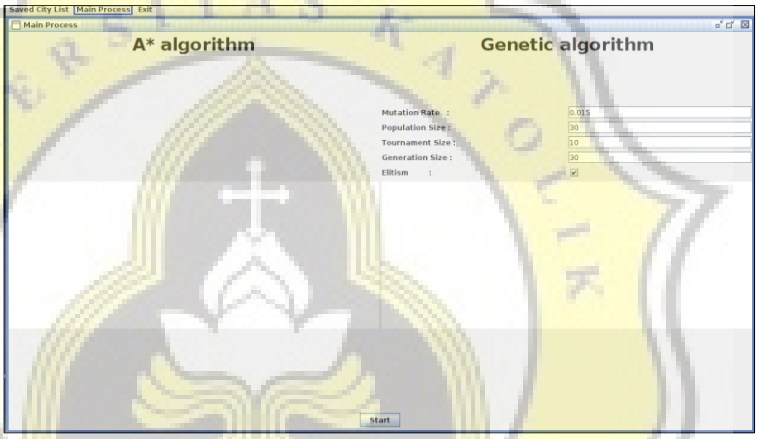

Figure 12. Interface of Main Process menu

After finished giving required parameters for Genetic algorithm, then click the button Start to starts the process, the result of the process will be more like this.

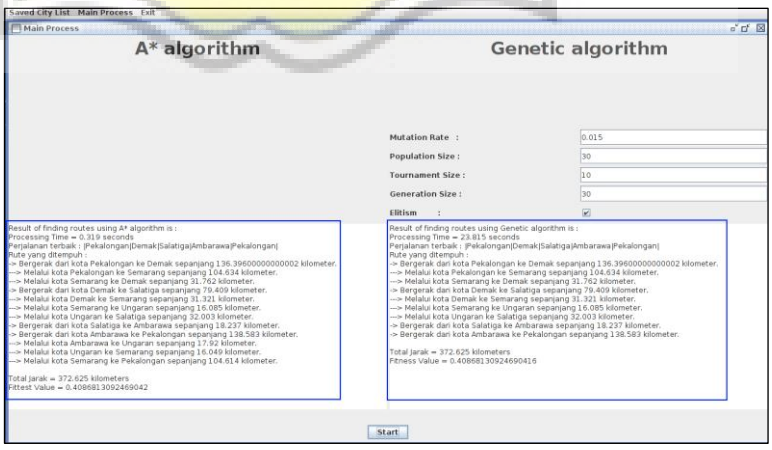

Figure 13. Result of Algorithms

5.2. Testing

5.2.1. Using 4 cities

Testing will be using Pekalongan, Demak, Salatiga, and Ambarawa as cities that needs to be visited.

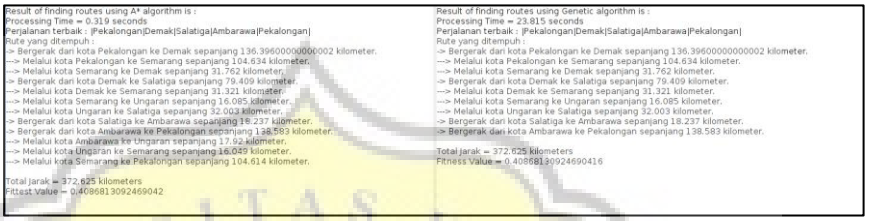

Figure 14. Result using 4 cities

From the multiple attempts, both algorithms always resulted in total distance 372.625 kilometers with the same pathways. The route path is Pekalongan – Demak – Salatiga – Ambarawa – Pekalongan. But the difference is A* algorithm (0.319 seconds) have better processing time than Genetic algorithm (23.815 seconds). So in this 4 cities input, A* algorithm are better than Genetic algorithm because of its short processing time.

5.2.2. Using 5 cities

Testing will be using Semarang, Ungaran, Pekalongan, Kudus, and Salatiga as cities that needs to be visited.

Figure 15. Result using 5 cities

From the multiple attempts, both algorithms total distance resulted around 420.241 kilometers with the same pathways. The route path is using Semarang – Pekalongan – Kudus – Salatiga – Ungaran – Semarang, but in different start city. The difference of processing time, A* algorithm are about 0.697 seconds and Genetic algorithm is about 19.536 seconds. So in this 5 cities input, A* algorithm are yet better than Genetic algorithm because of its short processing time.

5.2.3. Using 6 cities

Testing will be using Demak, Kudus, Ambarawa, Salatiga, Pekalongan, and Semarang as cities that needs to be visited.

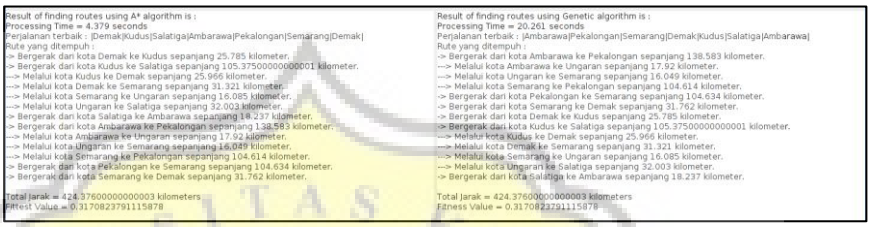

Figure 16. Result using 6 cities

From the multiple attempts, both algorithms total distance resulted around 424.376 kilometers with the same pathways. The route path is using Demak – Kudus – Salatiga – Ambarawa – Pekalongan – Semarang – Demak, but in different start city. The difference of processing time, A* algorithm are about 4.379 seconds and Genetic algorithm is about 20.261 seconds. So in this 6 cities input, A* algorithm are yet still better than Genetic algorithm because of its short processing time. Even though, A* processing time has started to get slower, and Genetic still keeps around 20 seconds processing time.

5.2.4. Using 7 cities

Testing will be using Semarang, Demak, Ambarawa, Pekalongan, Salatiga, Kudus, and Ungaran as cities that needs to be visited.

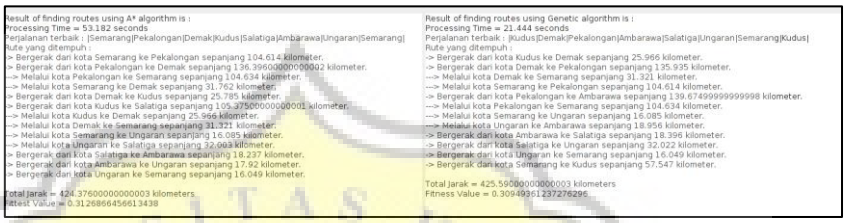

Figure 17. Result using 7 cities

From the multiple attempts, total distance of A* algorithm resulted in 424.376 kilometers and Genetic algorithm with 425.59 kilometers. The best route path is using Semarang – Pekalongan – Demak – Kudus – Salatiga – Ambarawa – Ungaran – Semarang found by A* algorithm. The difference of processing time, A* algorithm are about 53.182 seconds and Genetic algorithm is about 21.444 seconds. So in this 7 cities input, Genetic algorithm becomes better than A* algorithm because of its short processing time. Even though, A* has better minimum cost than Genetic algorithm, but that problem can be set by changing Genetic parameters to get the same minimum cost with A* algorithm.