

## Minor and Major Project Minutes of Meeting

Full name of student	Jason Tione Wang Yip King Cheung
Student ID number	160078066
Date of meeting	19 <sup>th</sup> February 2019, Week 4 Room G12
Date of previous meeting	7 <sup>th</sup> February 2019

### Meeting Agenda:

- Discussion on how to use the minute of meeting for report (5 minutes)
- Fitness algorithm review by supervisor (20 minutes)
- Discussion of small change algorithm (25 minutes)
- Discussion of hill climbing algorithm (25 minutes)
- Discussion of the poster assignment for CS38220 (15 minutes)

### Action Item/s from the previous meeting

- Refine and upload the project outline on blackboard by Friday 8th February 2019
- Send over the minutes of meeting next week for signing off by supervisor
- Continue with the Read File-Distance Matrix and the Fitness calculation.

### Matters Arising from the Minutes

#### Agenda Item #1 Minutes of meeting feedback and advice

The supervisor provided a verbal feedback of the last week minutes of meeting. The format and spacing is crucial in producing a professional document. The supervisor also advice to add an appendix at the end of document to link the item discussed in the "Matters Arising from Minutes" section.

#### Agenda Item #2 Review of Fitness algorithm

The Fitness algorithm was reviewed with the supervisor during the meeting. It is advice to provide a unit test together with the algorithm in the coming report.

#### Agenda Item #3 Discussion of small change algorithm

The supervisor presented the 2-opt small change algorithm and some point to look out when implementing it (see Appendix A). The supervisor shows example on how to use the set function to swap the index and the usage of the clone function.

Action item 2: Correct the error and continue with small change algorithm

#### Agenda Item #4 Review of Random Mutation Hill climbing algorithm

The supervisor presented the hill climbing algorithm and some point to look out when Implementing (see Appendix A). The advantage of using the small change is to reduce the fluctuation of the distance value during calculation.

Action Item 2: Continue with the hill climbing algorithm

## Minor and Major Project Minutes of Meeting

### Agenda Item #5 Discussion of the poster assignment for CS38220

The draft version of the poster was discussed with the supervisor. The standard and criteria was discussed with the supervisor. The supervisor provided some advice on the future working and the possible tools that are available to design professional poster.

### Action Item/s

1. Send over the minutes of meeting to supervisor for signoff  
Action: Jty
2. Continue with the small change and hill climbing algorithm  
Action: Jty

**Signature of student:**



**Date:** 25 February 2019

**Signature of supervisor:**



**Date:** 25 Feb 2019

## Minor and Major Project

### Minutes of Meeting

#### Appendix A

The following algorithm was provided by the supervisor. The algorithm 1 is about the fitness function to calculate the fitness of a tour. The algorithm 2 is about the random mutation hill climbing. Algorithm 3 is about the small change to be used in the hill climbing algorithm

Algorithm 1 : Traveling Salesman Problem Fitness Function	
Input:	N      The number of cities to visit T      A tour (list of integers of size N) D      An N by N matrix containing each $d(i,j)$
1.	Let $s = 0$
2.	For $i = 1$ to $(N-1)$
3.	Let $a = t_i$
4.	Let $b = t_{i+1}$
5.	Let $s = s + d(a,b)$
6.	End For
7.	Let end city = $t_n$
8.	Let start city = $t_1$
9.	Let $s = s + d(\text{end city}, \text{start city})$
Output:	The tour length $s$

Algorithm 2 : Traveling Salesman Problem of Hill Climbing	
Input:	D = An N by N matrix for cities distance T = A tour (list of integers of size N) Iter = number of iteration
1	Let T = a random tour (initial solution)
2	Let fitness = Distance summation of T (Algorithm 1)
3	For $i=0$ to $\text{iter}-1$
4	$T' = \text{re-arrange } T \text{ for 2-option small change}$
6	New Fitness = Distance summation of $T'$ (Algorithm 1)
7	if new fitness < fitness
8	fitness = New Fitness
9	$T = T'$
10	end if
11	end for
Output:	T, fitness

Algorithm 3 : 2-Opt Small Change	
Input:	T = A tour (list of integers of size N)
1	Let randFrom = a random number for index of size $T-1$
2	Let randTo = a random number for index of size $T-1$
3	$T' = \text{clone of } T$
4	int city A = city of index randFrom from T
6	int city B = city of index randTo from T
7	$T' = \text{set } T' \text{ index randTo as city A}$
8	$T' = \text{set } T' \text{ index randFrom as city B}$
Output:	$T'$ as the new tour arrangement after small change