East West University
Department of Computer Science and Engineering

CSE106 Discrete Mathematics
Mini-Project

Mini Project 1 (for odd group number)

1. Using C program, randomly generate a directed graph represented by adjacency matrix with $n = 1000$ vertices.
2. Determine in-degrees and out-degrees of all vertices and show that sum of in-degrees and sum of out-degrees are equal. Determine computational time in this step (except printing time) in ms.
3. Repeat steps 1 and 2 for $n = 2000$, $n = 3000$, $n = 4000$, and $n = 5000$.
4. Using MATLAB, draw a graph showing computational time vs. n. From the graph, determine an approximate time complexity of your program as a function of n.
5. Theoretically determine the computational time complexity of your program as a function of n and compare that with the time complexity found in step 4.
6. Give a 5-minute power point presentation on your mini project on the specified date and time.
7. Submit (i) the C source code, (ii) a 3-page report, and (iii) the power point presentation to the Google Classroom within the submission deadline. This submission will be group-based.

Mini Project 2 (for even group number)

1. Using C program, randomly generate an undirected graph represented by adjacency matrix with $n = 1000$ vertices.
2. Determine number of edges in the graph. Determine degrees of all vertices. Show that Handshaking logic holds. Determine computational time in this step (except printing time) in ms.
3. Repeat steps 1 and 2 for $n = 2000$, $n = 3000$, $n = 4000$, and $n = 5000$.
4. Using MATLAB, draw a graph showing computational time vs. n. From the graph, determine an approximate time complexity of your program as a function of n.
5. Theoretically determine the computational time complexity of your program as a function of n and compare that with the time complexity found in step 4.
6. Give a 5-minute power point presentation on your mini project on the specified date and time.
7. Submit (i) the C source code, (ii) a 3-page report, and (iii) the power point presentation to the Google Classrooml within the submission deadline. This submission will be group-based.

Note: Each group will consist of 3 students.

Mark Distribution:

1. Program accuracy and quality (cognitive):	3.0
2. Report quality (cognitive):	1.0
3. Report quality (Psycho-motor – communication skill):	0.5
4. Presentation quality (cognitive):	4.0
5. Presentation quality (Psycho-motor – communication skill):	0.5
6. Presentation quality (Affective):	0.5
7. Question-answer (affective):	0.5
Total:	10.0