# Abstract

With development, the TSP algorithm developed to solve the problem of clustering documents by analogising document as a node. ACO algorithm is one of optimization algorithms that solve the TSP. ACO algorithm consists of AS, ASrank, MMAS, EAS, and ACS. AS is the first algorithm that is applied by applying *random proportional* transition rule, but for the large number of nodes (> 30 nodes), this algorithm is not optimal and have long execution time. AS algorithm development, namely ASrank algorithm, MMAS, and EAS also has not provide optimal solutions and the stable execution time. Therefore, the ACS algorithm is then developed as an improvement from the AS algorithm by applying *pseudorandom proportional* transition rule. In this Final Project, ACS algoritham will be implemented as an improvement from the AS on matters of clustering algorithms.

On the clustering of documents, the quality of the resulting clusters can not be seen from the number of ants and generated a total distance of the AS and the ACS algorithm in Phase Trial stage. In the experiments, the value of the coefficient of attachment which produces the index value bou ldin Davies is the optimal test data 40 document = 0066, 50 test data documents = 0.07, test data = 0.0875 60 documents, 80 test data document = 0.1035. From the test results, the ACS algorithm requires a faster execution time compared to the AS algorithm, because at the ACS algorithm is applied the rules of the pseudo-random proportional transition, where the selection of documents that will be passed, the ant can only apply the rules of exploitation which utilize existing information, not need to calculate the probability of all documents. In addition, the global pheromone updating rule in ACS has also renewed the amount of pheromone on the tour only the best, not the entire tour that skipped all the ant algorithm as in the AS.

Keywords: document clustering, TSP, *random proportional*, *pseudorandom proportional*, *AS* Algorithm, *ACS* Algorithm, *Coefficient of Attachment*, *Davies-Bouldin Index.*