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# Algorithmic Study of Optimising the Network Model of Kanchi Mahaperiyava Holy Shrines

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## ABSTRACT

In this article, we are designing a network model to make a tour of famous shrines of Kanchi Mahaperiyava Sri Chandrasekharendra Saraswathi Swamigal with a vision of finding the optimal path that minimises the total time of visit, the travelling time and the darshan time. This study also recommends the visitors the optimal order (sequence) and the finest time to visit the shrines, based on the location where the individual starts. For performance analysis, the algorithm is carried out using C program.

**Key Words:** Kanchipuram, Mutt, Mahaperiyava, Optimal network, Travelling time, Darshan time

## INTRODUCTION

Kanchipuram, one among the seven holy cities of India, is a heaven on earth of several beautiful temples in every corner of the city. With many famous shrines, this city is an important pilgrimage city for Hindu devotees and also attracts the tourists and foreigners in plenty due to its rich culture and heritage. Rather than calling it a Temple City, it is also equally famous all over the world for its silk variety and quality. There is a very old mutt established by Sri Adisankaracharya called, Sri Kanchi Kamakoti Peetam, who established a Sri Chakra Yantra in front of the Goddess deity Sri Kamakshi Ambal.

For our study we are considering some important Mahaperiyava Shrines within the Kanchipuram city, namely Sri Sankara Mutt, Sri Mahaperiyava Sthubi, Sri Mahaperiya Manimandapam, Sri Thenambakkam Sankara Mutt, Vedal Heritage Museum.

The objectives of the study are set as follows:

a) To visit the listed holy shrines in a shortest way;

b) To achieve the tour of the holy shrines with less travelling and darshan time;

c) To find an optimal sequence of the shrines for each starting places.

## METHODOLOGY

In this study, the shrines are modelled as a network by considering each place as a 'node' and the roads joining the nodes as 'edges'. The time taken to travel from one node to another is assumed as travelling time (t) and is given as the weight for the edge while the time spent on the shrines is defined as darshan time (d), are assumed as the weight for the node.

This study is executed on a normal day assuming that the shrines does not have a large crowd. If it is a special day, the darshan time (d) definitely differs. The travelling time (t) connecting two nodes is the actual travel time by means of a two-wheeler / auto rickshaw, the traffic being ordinary. If the individuals choose to visit the places by a car or any other public means, a similar model may be used by changing the travelling time.

Block Time: Time duration during which the pilgrims are not allowed for darshan, in order to enable the priests to perform daily temple rituals for the principal deity.

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The shrines have different opening and closing times which varies only in minutes but have a common time. For making the study simple, we have generalised the opening time, closing time and block time as same for all the shrines. The solution of finding the optimal sequence is carried out using C Language.

Fig. 1 represents the network model of the shrines, is drawn satisfying the geographical locations of the temples in the matters for the nearness of the nodes and approachability.

The weights at the nodes are {3, 3, 30, 4, 3} and the adjacency matrix between the nodes is given below,

$$\begin{pmatrix} 0 & 2 & 11 & 12 & 9 \\ 2 & 0 & 11 & 12 & 10 \\ 11 & 11 & 0 & 16 & 17 \\ 12 & 12 & 16 & 0 & 9 \\ 9 & 10 & 17 & 9 & 0 \end{pmatrix}$$

The networks thus defined are intended to find the optimal sequence and the minimum duration to cover all the shrines by taking the travelling time ($t$) and the darshan time ($d$) into account. As this problem is having weights at the nodes, the solution of this particular problem is carried out by the algorithm defined here.

Divide the darshan intervals into various levels as (07.00, 08.50), (10.30, 11.30), (16.00, 18.00), are represented by ($O_1$, $C_1$), ($O_2$, $C_2$), and ($O_3$, $C_3$). The number of levels may increase during special days and festival day which can be solved in the same way. Node 3, Vedal Heritage Museum will be closed by 18.00, hence, in order to visit all the shrines in the evening, the sequence must commence from node 3 if the visitor performs the tour in the evening.

## ALGORITHM

***Step* 1:** Start at any node (preferably at level 1).

***Step* 2:** Finish darshan.

***Step* 3:** Look for other nodes in the same level wherein ($t$ + $d$) fits in ($O$, $C$). If there are more such nodes, choose the one where $t + d$ is smaller (in the same level).

***Step* 4:** If no such node is available in the level, look for the next level. If there is a tie choose the one where ($t$ + $d$) is nearer to $C$.

***Step* 5:** Go to that node, finish darshan.

***Step* 6:** If there is no more node to visit, then stop.

***Step* 7:** Otherwise, go to *Step* 3.

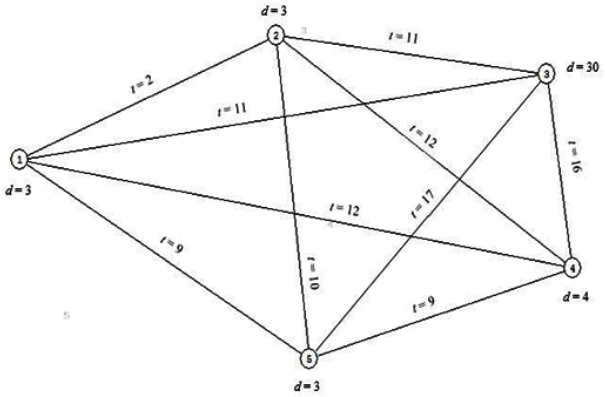


**Figure 1:** Sri Sankara Mutt, 2. Sri MahaperiyavaSthubi, 3. Vedal Heritage Museum, 4. Sri MahaperiyavaManimandapam, 5. Sri ThenambakkamSankara Mutt.

## RESULTS

Based on the above algorithm, a C–Program has been developed to find the optimal sequence for making the tour of the shrines in the least possible time for each starting node. Fig. 2 represents the program output to visit the temples finding the optimal sequence for every starting nodes.

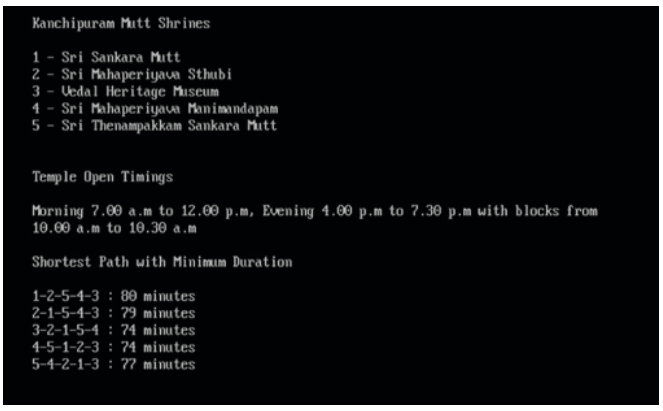


**Figure 2:** Program output with total description.

## CONCLUSION

The study gives an optimal sequence that minimises the total duration of visiting Kanchi Mahaperiyava holy shrines for every starting nodes. This algorithm may be used for any network model having weights both at the nodes and the edges by changing the term '*darshan time* ($d$)' accordingly and the '*travelling time* ($t$)' as it is, along with some predetermined block time on the nodes.

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