Advanced Programming

ASsignment # 1 Assembly line problem

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# Documentation

Public repo: https://github.com/talalmts/CS-213-Advanced-Programming

## ASSEMBLY LINE PROBLEM:

Assembly Line is the problem where we need to find the optimal time for a car to cross all the respective station in the lowest time in parallel assembly line having same number of station but different processing time. In this case we have two parallel lanes having multiple station with different performance complete the work at the given station.

## Classes:

### AssemblyLine:

In this class we solve the assembly line problem by applying the fastest way algorithms using dynamic programming approach to optimize the running time of the solution so we provide the best possible outcome.

### Fastestway (Lane, Lane):

Take two lane having same number of station and transition from one lane to another. Calculate the optimal time for a car to cross the assembly line in the optimal time.

### Path ():

Print the outcome path that should be taken from start to finish in order to get the optimal solution.

## Lane:

In this class lane structure is define having attributes to describe each lane accordingly to find the fastest way through the assembly line.

Default constructor take all the input from the user and fill them in the appropriate position to correctly represent the data.

### Attributes:

#### Stationtime:

Array of integer storing processing time for each station in that lane

#### Transtiontime

Array of integer storing swap time from current lane to the other lane

#### Entrytime:

Time taken to entry the lane

#### Exittime:

Time taken exit that lane

## UNIT TEST:

### UnitTest\_OptimalTest (Lane L1, Lane L2):

Test the basic correctness of the algorithms. Check if the Fastestway algorithms is complete and provide the optimal solution. Check the value of the solution of the algorithm with the correct answer.

### UnitTest\_Pathtest ():

Test the functionality of the fastestway algorithm whether it provide the optimal path or not. This path is than compare with the optimal path known for a certain problem to check it correctness.

## Other Information about the Source code:

-help

cc.ee.ntu.edu.tw/~ywchang/Courses/Alg/unit4.**pdf**

www1.coe.neu.edu/~sfreeman/.../**Assembly**%20**Line**%20Balancing.**ppt**