

aDVANCED PROGRAMMING

Assignment 01



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IQRA TAHIR (00755)

BSCS – 2B

# **Assembly Line Simulation**

# **Purpose:**

Want to minimize the run time O (2n). Through dynamic programming, this problem takes O (n) run time.

# **Library Used:**

* Built-in libraries of java

# **Unit Testing:**

* By assigning values to e, x, a and t by random generator.

a = time spent at station S

t = time required to make a switch from a station on one line to the other

x = exit time of a complete car

e = entry time

# **Implementation:**

Our assembly line problem is “what is the time to transfer the chasis from one line to

the other”.

For solving this problem, first characterize the problem into sub problems. Then solve the sub problems of finding the fastest ways through station j-1 on both lines.

Algorithm which I used is fastest way algorithm. Here is the algorithm given below:

1. The minimum time through station (1) on line (1) is simply the entrance time on line (1) plus the processing time at station (1) on line (1) which means (e1 + a11)
2. Similarly the minimum time through station (1) on line (2) is (e2 + a21)
3. The minimum time through station (j) on line (1) is the smaller value of two time values. The first time value is the processing time at station (j) on line (1) plus the minimum time through station (j-1) on line (1). The second time value to consider is the processing time at station (j) on line (1) plus the transfer time from station (j-1) on line (2) plus the minimum time through station (j-1) on line (2).
4. Similarly, the minimum time through station (j) on line (2) is the smaller value of two time values. The first time value is the processing time at station (j) on line (2) plus the minimum time through station (j-1) on line (2). The second time value to consider is the processing time at station (j) on line (2) plus the transfer time from station (j-1) on line (1) plus the minimum time through station (j-1) on line (1).