**Student Id: BC190202247**

**Student Name: FAHAD**

**Code: CS614**

**Assignment # 02**

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**Solution 1:**

* Time for sequential execution of tasks = N \* T
* Steps including assembling, wrapping, welding & stamping, so pipeline would be according to this formula:

**T+(N-1)\*T/M**

* After putting the values in formula **where T = weeks, N = No. of manufacturing motorcycles, M = No. of steps**:

=T+(N-1) \* T/M

= 6 + (50-1) \* 6/4

= 6 + (49) \* 6/4

= 300/4

=75

Speed-up time formula: S= NT/T + (N-1) \* T/M

* After putting the values in formula **where T + (N-1) \* T/M = 75 & NT= 300**

**S =** NT/T + (N-1) \* T/M

S = 300/75

S = 4.

So, by implementing this pipeline approach, the speed-up time achieved for manufacturing 50 motorcycles in a row is 4 times faster.

**Solution 2:**

1. **Cluster indexing on Name:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Teacher\_ID** | **Name** | **Department** | **Joining\_Date** | **City** |
| T03 | Ahmed | CS | Oct 5, 2009 | Karachi |
| T02 | Ali | CS | May 11, 2010 | Islamabad |
| T06 | Arif | CS | Nov 14, 2005 | Lahore |
| T04 | Farooq | SE | Mar 10, 2011 | Lahore |
| T05 | Farzand | IT | June 25, 2016 | Karachi |
| T01 | Hamza | SE | July 19, 2013 | Lahore |

1. **Cluster indexing on Department:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Teacher\_ID** | **Name** | **Department** | **Joining\_Date** | **City** |
| T02 | Ali | CS | May 11, 2010 | Islamabad |
| T03 | Ahmad | CS | Oct 5, 2009 | Karachi |
| T06 | Arif | CS | Nov 14, 2005 | Lahore |
| T05 | Farzand | IT | June 25, 2016 | Karachi |
| T04 | Farooq | SE | Mar 10, 2011 | Lahore |
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