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|  | **[Design & Analysis of Algorithm]**  **[BSCS – 5 A]**  **Department of Computer Science**  **Bahria University, Lahore Campus** |

**Assignment: 4**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Roll No: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **Evaluation of CLO** | **Question Number** | **Marks** | **Obtained Marks** |
| **CLO statement**   * **CLO 2:** **Analyze the time and space complexity of different algorithms.** * **CLO 3: Design algorithms to solve simple computational problems and compare the implementations empirically.** | 1  2 | 0.5  4.5 |  |
| **Total Marks** | | **5** |  |

**Part1: CLO 2: Analysis**

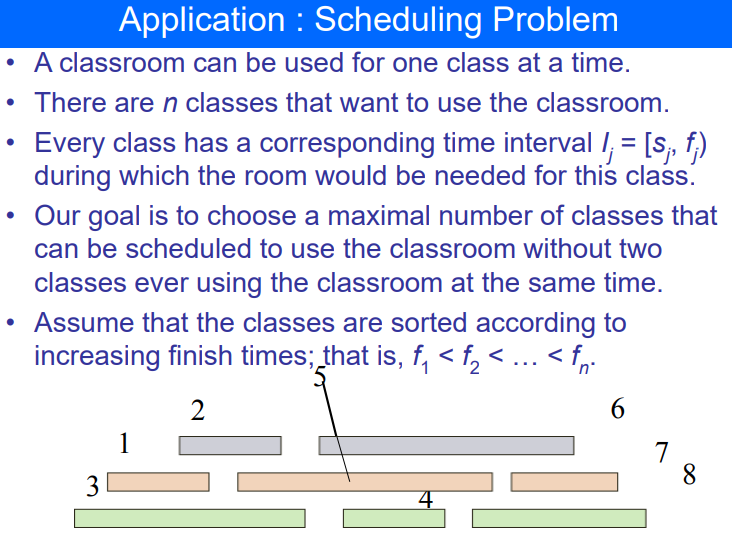
**Reading Task: Explore and briefly discuss time & space complexity of AVL Trees and Red-Black Trees from following sources, you can also use other resources to study. [0.5]**

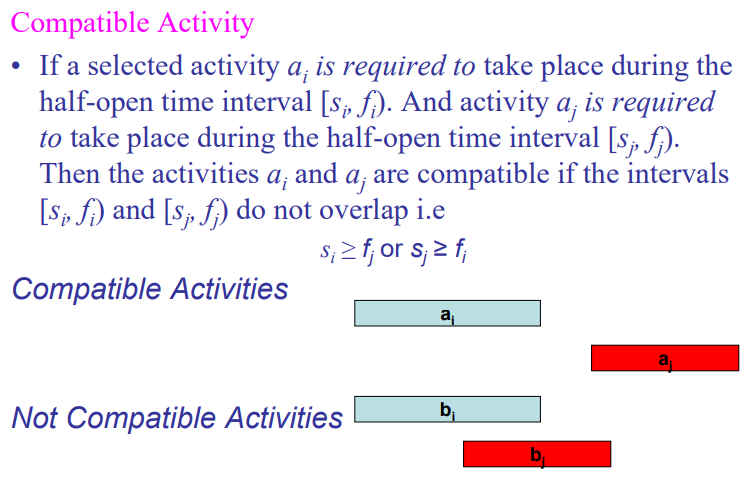
1. <https://iq.opengenus.org/time-and-space-complexity-of-red-black-tree/>
2. <https://iq.opengenus.org/time-complexity-of-avl-tree/>

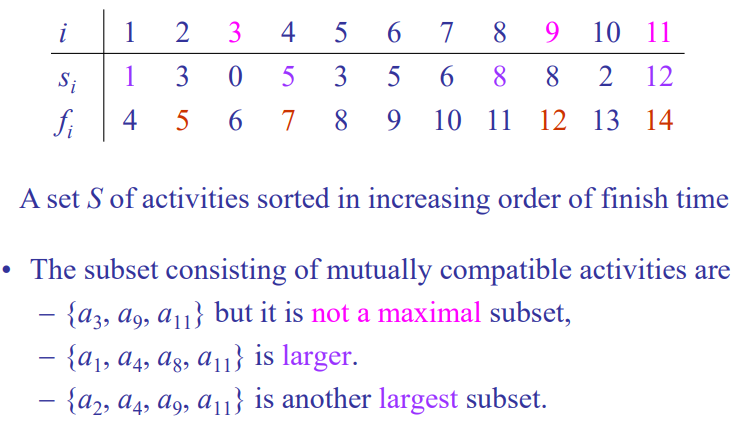
**Part 2: CLO 3: Design algorithms [4.5]**

The problem involves scheduling of several competing activities that require exclusive use of common resource Problem Statement. Suppose we have a set: ***S = {a1 , a2 , ..., an }*** of ***n*** proposed activities. Each activity wish to use a resource which can be used by only one activity at a time. Each activity ***ai*** has starting time ***si*** , finishing time ***fi*** where, 0 ≤ si < f i < ∞

Objective in activity-selection problem is to select a maximum-size subset of mutually compatible activities. Its application is explained through scheduling example given below:

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