**Process scheduling** is an essential part of a Multiprogramming operating system. Such operating systems allow more than one**process** to be loaded into the executable memory at a time and loaded**process** shares the CPU using time multiplexing.

**Task Scheduler** is a component of Microsoft Windows that provides the ability to **schedule** the launch of programs or scripts at pre-defined times or after specified time intervals. It was first introduced in the Microsoft Plus! for Windows 95 as System Agent but was renamed to**Task Scheduler** in Windows 98.

**Scheduling** is the process of arranging, controlling and optimizing work and workloads in a **production** process or manufacturing process.**Scheduling** is used to allocate plant and machinery resources, plan human resources, plan **production** processes and purchase materials

**CPU Scheduling** is the process used to maximize the **CPU** utilization.**CPU Scheduling** is done in following circumstances: When process switches from the running stage to waiting state. When process switches from the running stage to ready state. When process switches from the waiting stage to ready state.

The number of queues. The **scheduling algorithm** for each queue. The methods used to upgrade or demote processes from one queue to another. ( Which may be different. ) The method used to determine which queue a process enters initially.

**Q. What is project scheduling? Explain different techniques for project scheduling?**

|  |
| --- |
| Project Scheduling  Project scheduling is concerned with the techniques that can be employed to manage the activities that need to be undertaken during the development of a project.  Scheduling is carried out in advance of the project commencing and involves:  •    identifying the tasks that need to be carried out;  •    estimating how long they will take;  •    allocating resources (mainly personnel);  •    scheduling when the tasks will occur.  Once the project is underway control needs to be exerted to ensure that the plan continues to represent the best prediction of what will occur in the future:  •    based on what occurs during the development;  •    often necessitates revision of the plan.  Effective project planning will help to ensure that the systems are delivered:  •    within cost;  •    within the time constraint;  •    to a specific standard of quality.  Two project scheduling techniques will be presented, the Milestone Chart (or Gantt Chart) and the Activity Network.  Milestone Charts  Milestones mark significant events in the life of a project, usually critical activities which must be achieved on time to avoid delay in the project.  Milestones should be truely significant and be reasonable in terms of deadlines (avoid using intermediate stages).  Examples include:  •    installation of equipment;  •    completion of phases;  •    file conversion;  •    cutover to the new system  Gantt Charts  A Gantt chart is a horizontal bar or line chart which will commonly include the following features:  •    activities identified on the left hand side;  •    time scale is drawn on the top (or bottom) of the chart;  •    a horizontal open oblong or a line is drawn against each activity indicating estimated duration;  •    dependencies between activities are shown;  •    at a review point the oblongs are shaded to represent the actual time spent (an alternative is to represent actual and estimated by 2 separate lines);  •    a vertical cursor (such as a transparent ruler) placed at the review point makes it possible to establish activities which are behind or ahead of schedule.    Activity Networks  The foundation of the approach came from the Special Projects Office of the US Navy in 1958. It developed a technique for evaluating the performance of large development projects, which became known as PERT - Project Evaluation and Review Technique. Other variations of the same approach are known as the critical path method (CPM) or critical path analysis (CPA).  The heart of any PERT chart is a network of tasks needed to complete a project, showing the order in which the tasks need to be completed and the dependencies between them. This is represented graphically:  EXAMPLE OF ACTIVITY NETWOK  The diagram consists of a number of circles, representing events within the development lifecycle, such as the start or completion of a task, and lines, which represent the tasks themselves. Each task is additionally labelled by its time duration. Thus the task between events 4 & 5 is planned to take 3 time units. The primary benefit is the identification of the critical path.  The critical path = total time for activities on this path is greater than any other path through the network (delay in any task on the critical path leads to a delay in the project).  Tasks on the critical path therefore need to be monitored carefully.  The technique can be broken down into 3 stages:  1. Planning:  •    identify tasks and estimate duration of times;  •    arrange in feasible sequence;  •    draw diagram.  2. Scheduling:  •    establish timetable of start and finish times.  3. Analysis:  •    establish float;  •     evaluate and revise as necessary |