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Pre-class Assignment #1

1. Give the definition (note: not the roles) for an operating system as stated in the textbook.

An operating system is the layer of software that manages a computer's resources for its users and their applications.

2. Give the definitions of the three roles for an operating system as stated in the textbook.

Referee: They manage shared resources between different applications running on the same physical machine.

Illusionist: They provide an abstraction physical hardware to simplify application design.

Glue: A set of common services between applications.

3. For the following items, circle the relevant role of an operating system acting as a Referee, Illusionist, or Glue:

(a) **R** / I / G Resource allocation among users and applications.

(b) R / **I** / G Higher-level objects are provided, such as files.

(c) R / I / **G** Files written by one application can be read by another application.

4. Define virtualization.

Virtualization provides an application with the illusion of resources that are not physically present.

5. Define the following terms:

   (a) availability

       The percentage of time that the system is usable.

   (b) efficiency

       A performance metric of the abstraction presented to
       applications.

   (c) overhead

       The added resource cost of implementing an abstraction.

   (d) predictability

       Whether a the system's response time or other metric is
       consistent over time.

   (e) response time (delay)

       How long it takes for a single specific task from when it
       starts until it completes.

   (f) reliability

       Whether a system does exactly what it is designed to do.

   (g) throughput

       The rate at which a group of tasks can be completed.

   (h) utilization

       The percentage of time a resource is busy.