1)It allows for the computer to use more memory than the machine has.
2) advantage: it is more efficient it does not require a trap in the kernel
disadvantage : a system block call in a thread, blocks all threads.
3) It works with preemptive scheduling because it was designed for it. when initially 'turn' is set to 0 but process 1 is executed first. It will just loop indefinitely, never releasing the CPU.
4)using semaphores would not work for this problem given the info provided.
5)the operating system would have to first disable interrupts then implement semaphores

6) order taker input order and outputs it to cooks does the same to pack specialist who then does the same to the cashier

7)the answer depends on x is equal to, mainly the jobs are ran from shortest to long to minimize response time.
If x is smallest we start with x
If x is largest we finish with x
8)to find prediction we do

$$(((40 + 20) / 2 + 40) / 2 + 15) / 2 = ((30 + 40) / 2 + 15) /2$$
$$= (35 + 15) / 2 = 25$$

9) Yes because no matter what someone will be able to eat

10) Readers can all access the data at the same time there is no problem there, but when writer comes in we need to freeze the queue of all readers, when the readers run out the writers can come in.