3. (a) The input to the GPU is a list of geometric primitives, typically triangles, in a 3-D world coordinate system. Through many steps, those primitives are shaded and mapped onto the screen, where they are assembled to create a final picture. I

Vertex Operations: The input primitives are formed from individual vertices. Each vertex must be transformed into screen space and shaded, typically through computing their interaction with the lights in the scene. Because typical scenes have tens to hundreds of thousands of vertices, and each vertex can be computed independently, this stage is well suited for parallel hardware.

Primitive Assembly: The vertices are assembled into triangles, the fundamental hardwaresupported primitive in today's GPUs.

Rasterization: Rasterization is the process of determining which screen-space pixel locations are covered by each triangle. Each triangle generates a primitive called a fragment at each screenspace pixel location that it covers. Because many triangles may overlap at any pixel location, each pixel's color value may be computed from several fragments.

Fragment Operations: Using color information from the vertices and possibly fetching additional data from global memory in the form of textures (images that are mapped onto surfaces), each fragment is shaded to determine its final color. Just as in the vertex stage, each fragment can be computed in parallel. This stage is typically the most computationally demanding stage in the graphics pipeline.

 Composition: Fragments are assembled into a final image with one color per pixel, usually by keeping the closest fragment to the camera for each pixel location.

4. a) The boot process is something that happens every time you turn your computer on. You don't really see it, because it happens so fast. You press the power button come back a few minutes later and Windows XP, or Windows Vista, or whatever Operating System you use is all loaded. The BIOS chip tells it to look in a fixed place, usually on the lowest-numbered hard disk (the boot disk) for a special program called a boot loader (under Linux the boot loader is called Grub or LILO). The boot loader is pulled into memory and started. The boot loader's job is to start the real operating system.

Master Boot Record:

 The Master Boot Record (MBR) is a small program that starts when the computer is booting, in order to find the operating system (eg. Windows XP). This complicated process (called the Boot Process) starts with the POST (Power On Self Test) and ends when the Bios searches for the MBR on the Hard Drive, which is generally located in the first sector, first head, first cylinder (cylinder 0, head 0, sector 1). A typical structure looks like: The bootstrap loader is stored in computer's EPROM, ROM, or another non-volatile memory. When the computer is turned on or restarted, it first performs the power-on-self-test, also known as POST. If the POST is successful and no issues are found, the bootstrap loader will load the operating system for the computer into memory. The computer will then be able to quickly access, load, and run the operating system.

Init:

Init is the last step of the kernel boot sequence. It looks for the file /etc/inittab to see if there is an entry for init 5default. It is used to determine initial run-level of the system. A run-level is used to decide the initial state of the operating system. Some of the run levels are: Level 0 –> System Halt 1 –> Single user

mode 3 –> Full multiuser mode with network 5 –> Full multiuser mode with network and X display manager 6 –> Reboot