CS323 – Exercises
Week 1
23 Feb 2018

Exercise 1:

From the list below, say which items are part of the OS and which are not. For those that are, explain how each creates convenience for users and which hardware resources they are managing. Would it be possible for user-level programs to provide these services?

a) Scheduler       e) File management
b) Video player    f) Command interpreter
c) VPN client      g) Text editor
d) Device drivers  

Exercise 2:

What is the purpose of system calls? How do language libraries (such as libc) the kernel API and system calls interact? In the list below, which of the C Library functions make use of system calls and which don’t? Why?

a) malloc()        f) getchar()
b) printf()        g) isdigit()
c) sqrt()          h) time()
d) strcmp()        i) diffmtime()
e) strcat()        j) fseek()

Exercise 3:

What is the purpose of interrupts? How does an interrupt differ from a trap? Can traps be generated intentionally by a user program? If so, for what purpose? (Exercise 1.19 from Operating System Concepts)

Further Reading
For those who are interested in broadening the knowledge in the kernel design topic, or more precisely about monolithic kernels and microkernels, we suggest an interesting read about the famous Tanenbaum–Torvalds debate.
The Tanenbaum–Torvalds debate was a debate between Andrew Tanenbaum (Prof. of Computer Science) and Linus Torvalds (Software engineer, creator of the Linux kernel), regarding the Linux kernel and kernel architecture in general. Tanenbaum began the debate in 1992 on the Usenet discussion group comp.os.minix, arguing that microkernels are superior to monolithic kernels and therefore Linux was, even in 1992, obsolete.

Part 2: http://www.cs.vu.nl/~ast/reliable-os/