

Computer Science 801

Fall 2000

Homework 1

Due: Thursday, 10/5/2000

1. Recall the four basic functions of a computer (data processing, data storage, data movement, and control of these tasks). Give examples of how each of these functions may be realized by a user working in Maya.
2. The driver for an external device normally disables interrupts during its interrupt handler routine. What would be the effect on the processing ability of the computer if the interrupt handler forgot to enable interrupts upon exiting?
3. What would happen if an external device (e.g., a printer) never generated any interrupts?
4. If a computer has a word length of 4 bytes and a word address length of 20 bits, what is the total amount of memory available in the system?
5. What is the purpose of cache?
6. Give a truth table for the following logical expression.

$$(P + Q) \cdot P$$

7. Evaluate the following give that $P=1$ and $Q=0$:
 - a. $QP \oplus (Q + P)$
 - b. $\neg((P + Q) \oplus Q)$
 - c. $QP (\neg Q + \neg P)P$
 - d. $\neg(\neg(QP) + (\neg Q)(\neg P))$
 - e. $R \oplus R$

8. Draw a circuit diagram for the following expression:

$$F = XY + \neg Z$$