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1.1, 1.2, 1.3, 1.4 (see page 54 and 55 of the textbook)

1.1

1) Computers in cars that can display information for the driver or even drive the car itself.
2) Search engines which access huge stores of data for users.
3) Thermostats for homes are now computerized, allowing users to set temperatures for different times.
4) Self checkout machines in some shops allow the user to input items that they have purchased and pay without a large amount of help from an employee.

1.2

a) Assembly line in automobile manufacturing **- Performance via Pipelining**
b) Suspension bridge cables **- Performance via Parallelism**
c) Aircraft and marine navigation systems that incorporate wind information **- Abstraction to Simplify Design**
d) Express elevators in buildings - **Common Case Fast**
e) Library reserve desk **- Dependability via Redundancy**
f) Increasing the gate area on a CMOS transistor to decrease its switching time **- Design for Moore's Law**
g) Adding electromagnetic aircraft catapults (which are electrically-powered as opposed to current steam-powered models), allowed by the increased power generation offered by the new reactor technology **- Performance via Prediction**
h) Building self-driving cars whose control systems partially rely on existing sensor systems already installed into the base vehicle, such as lane departure systems and smart cruise control systems **- Hierarchy of Memories**

1.3

1) The compiler take the program written in a high level language and translates it into an assembly language. The assembler then takes the assembly language and converts it into binary. The machine is then able to compute the commands given in binary.

1.4

a) With eight bits for each RGB color pixel in a 1280x1024 screen, there would be (8*3)*(1280*1024) = 31,457,280 bits of information for a single frame.
b) To send one frame over a 100M bit/s network, it would take 31,457,280/104,857,600 = .3 seconds.