

1) An *algorithm* is a sequence of well-defined logical steps that must be taken in order to perform a task. Algorithms are used by programmers to describe a program informally, and develop a program via *step-wise refinement*. In English, write an algorithm to exit the building if the fire alarm goes off.

2) Below is the description of the hardware features of a desktop PC:

- Intel® Core™2 Duo Processor E6300 (2MB L2 Cache, 1.86GHz, 1066)
- Genuine Windows Vista™ Home Premium
- 2 GB Dual-Channel DDR2 SDRAM (667MHz), expandable to 4 GB
- 500 GB Serial ATA Hard Drive
- DVD+RW/CD-RW Drive
- 3.5" Floppy Drive and 13-in-1 Media Reader
- Graphics card: 512MB NVIDIA GeForce 7600 GS
- Sound Blaster X-Fi™ XtremeMusic with Dolby 5.1
- Video: 1 DVI, VGA and 1 S-Video (with add-in PCI-Express video card)
- 9 USB 2.0 ports and 2 IEEE 1394 (FireWire) ports
- Integrated (10/100/1000) Gigabit Ethernet
- Expansion Slots: 3 PCI Slots, 1 PCIe x1 Slot, 1 PCIe x16 (Graphics) Slots, 1 PCIe x4/x8 Slot

a) Identify the major hardware components: CPU, Main Memory, Secondary Storage, Input Devices, Output Devices

b) Explain why computers have both main memory and secondary memory.

3) Is the operating system (e.g., Windows Vista) hardware or software?

4) What is the role of the operating system?

5) A simple Input, Process, and Output program to calculate your mileage is:

```
# Simple mileage calculator example of a
# Input, Process, Output program

miles = input("Enter the number of miles driven: ")
gallons = input("Enter the number of gallons: ")
mileage = miles / gallons
print "Your mileage was", mileage, "miles per gallon."
```

A sample user interaction might look like:

```
Enter the number of miles driven: 300
Enter the number of gallons: 15
Your mileage was 20 miles per gallon.
```

Write a simple program to calculate your gross pay after inputting the number of hours worked and your hourly pay rate. (Hint: the multiplication operator in Python is “*”)