

# CS 1431 Assignment 1

Due on Fri. Jan. 26, 2001

Each student is required to do this assignment **individually**. Print or write down all of your source files, computer outputs and your inputs. Each page of your answer sheets should contain the following information clearly:

Name, Student Number, Assignment Number, Course Number (CS 1431)

All the answer sheets of your assignment should be stapled together.

Hand in the following:

- Paper work: Source files of Problem 1 and 2, and the inputs and outputs of these problems. Also indicate the compiler you used.
- A disk containing the files of problems: The source files and **executable** files which solve the problems.

Place these items in a 9" × 11" envelope, with the following information clearly marked on the outside of the envelope:

Name, Student Number, Course Number (CS 1431) and your email address.

Assignments which do not meet above rules will not be marked.

Deposit (submit) your assignment in Classroom on due date. The grade of the assignment will depend on:

Specification and documentation: 15 %

Format and readability: 15 %

Correctness: 70 %

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## Problem 1.

The following program reads 3 integers from keyboard and prints out the sorted results, i.e., prints these numbers in increasing order. Your job is to write the function `sort` and complete the program (add prototypes, for example). You might use the function `swap` discussed in class. Run your completed program several times and record the inputs and outputs.

```
#include<stdio.h>
main(void)
{
    int a,b,c;
    printf("Input three integers:\n");
    scanf("%d %d %d", &a,&b,&c);
    printf("\nThe numbers you inputed are:\n");
```

```
printf("%d,%d,%d\n",a,b,c);
sort(&a,&b,&c);
printf("The numbers after sorting are:\n");
printf("%d,%d,%d\n",a,b,c);
}
```

## Problem 2.

Construct a library named `volumes` containing functions that can be used to compute volumes of the following regular geometrical shapes. Write a driver program and test your library thoroughly.

1. Right circular cylinder:  $Volume = \pi r^2 h$ , where  $r$  is the radius of the base and  $h$  is the height.
2. Right circular cone:  $Volume = \pi r^2 h / 3$ , where  $r$  is the radius of the base and  $h$  is the height.
3. Sphere:  $Volume = 4\pi r^3 / 3$ , where  $r$  is the radius of the sphere.
4. Ellipsoid:  $Volume = 4\pi abc / 3$ , where  $a, b$  and  $c$  are the lengths of the semi-axes of the ellipsoid.