Comments on
System Development:
From Problem to Program

SFWR ENG 2B03

2003

Robert L. Baber

Goal

To conceive, plan, design, implement, document, etc. a system to satisfy stated requirements

- effectively

- efficiently

- i.e. with a reasonable expenditure of time

- i.e. without sleepless nights

The goal is to develop and document a system, not write a program

Nongoals

The goal is not

- to see how much time we can spend on the project

- to take as much time away from other courses as possible

- to spend as much time as possible in the lab

- to spend as much time as possible playing with our beloved computers

KISSS

Keep It

- Simple

- Small

- Systematic

Avoid unnecessary complexity

Thorough, complete analysis early pays off later

Think work early, mechanistic work later

Development phases

- Problem (requirements)
- Solution(s)

> — *Finish* above before proceeding —

- Specification
- Program

very expensive

Start with a *thorough* analysis and *finish* it

Don't start coding too early; it will almost always

turn out to be a waste of time

Subdividing a system into components

Subdivide a system into subcomponents so that

- cohesion within a subcomponent strong

- coupling between subcomponents weak

i.e.

- parts within a subcomponent closely related

- much data shared within subcomponent

- little data or few categories of data transmitted between subcomponents

Subdividing a system into components

Identify data needed throughout the entire system

Identify data needed only in parts of the system,
for only some of the system's functions
● such data often suggests subcomponents

I.e. subdivide functionally and with regard to
data needs (usually closely related)

Subdividing a system into components

In my experience useful question to pose:

If I could have any programming language
but with only about 5 commands,
which ones would I want?

They are my subcomponents.

Examples for class discussion

- Game playing program

- Student registration system

- Nuclear reactor control system

Goals, inputs, outputs, state data?