

ICS 52 - Introduction to Software Engineering
Midterm Exam #2 – Fall, 2007

Last Name: _____ First Name: _____

1. (10 points) Why is the design stage of software development particularly difficult?

2. (20 points) According to the Scientific American article “Command and Control,” system development at the NORAD Command Center had many years of failures, followed by significant successes.

Select one software principle or quality described in lecture or in the textbook, and explain how ignoring that principle or quality contributed to the failures. Be specific about the problems.

Select one software principle or quality described in lecture or in the textbook, and explain how following that principle or achieving that quality contributed to the successes. Be specific about what went right.

5. (30 points) Congratulations! You have just been hired as Software Architect for a new system called Geographical Information Assistant (GIA). GIA allows its users to type in a question such as “What is the capital of France?” or “What are the three biggest rivers in California?” or “Which countries border Paraguay but not Chile?” The questions can be asked in English, French, or Spanish. GIA can be accessed through a web page or via cell phone text messages. GIA then queries several databases, both public (on the WWW) and private (subscription only) to retrieve the information. The response is presented both as text in the language of the query, and as a map. Two programmers at your new company are arguing over what is the best software architecture for GIA. One says the Repository style is best, and the other says a Layered style is best. Discuss the pros and cons of these two approaches for this specific application, and for each approach draw a diagram (*not* a UML class diagram) showing the GIA architecture following that style. Make sure your diagrams are clearly labeled and clearly show a high-level design for GIA using each architectural style.

Repository style:

Layered style: