CS/ECE 347, Spring 1996
Recitation Assignment 5: Data Hazards

Assigned: Tue., Feb. 27
Due: Mon., Mar. 4

1. Introduction

Every computer chip made today uses some form of pipelining. Implementing pipelining does have costs however, and one of those costs is hazards. In this assignment, you will look at one type of hazard in-depth – data hazards.

The purpose of the assignment is (1) to increase your understanding of pipelining, (2) to teach you to identify data hazards.

2. Directions

Review sections 6.4, and 6.5. in Patterson and Hennessy. Get the file

```
/afs/cs/academic/class/15347-s96/public/recitations/ra5/hazard.mips
```

This file contains a MIPS program fragment.

1a) Use the format found in the example on pg. 400 to identify each occurrence of the 6 different types of data hazards in hazard.mips.

1b) Insert nops to avoid the data hazards. Only put as many nops as are necessary. How many nops did you add?

2) Write a MIPS asm program fragment of your own that contains all 6 types of data hazards. Make the program with as few instructions as possible. How many instructions is your fragment?

Please type the solutions to this assignment.