



HABIB UNIVERSITY
CS330L COMPUTER ARCHITECTURE LAB

Lab Project Report

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Chapter 1

Introduction

This project required us to build a 5-stage pipelined processor capable of executing a bubble sort program.

1. We modified the single-cycle processor to be able to run the bubble sort code on it.
2. We then modified the said processor to make it a pipelined one (5 stages). We then tested and run each instruction separately to verify that the pipelined version can at least execute one instruction correctly in isolation.
3. We then introduced circuitry to detect hazards (data, control, and structural) and tried to handle them in hardware i.e. by forwarding, stalling, and flushing the pipeline.

Chapter 2

Task 1

2.1 Modify single-cycle processor

We modified the single-cycle processor to be able to run the bubble sort code on it.

```
1 ABCD
```

Test Bench:

```
1 ABCD
```

Chapter 3

Task 2

3.1 5 Stage Pipelining

1 ABCD

Test Bench:

1 ABCD

Chapter 4

Task 3

4.1 Hazard Circuitry

1 ABCD

Test Bench:

1 ABCD

Chapter 5

Code

5.1 EDA Links

[Task 1 EDA Link](#)

[Task 2 EDA Link](#)

[Task 3 EDA Link](#)