

HPPS 2025  
Assignment Three: k-NN  
Implementation Report

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December 12, 2025

## 1 Introduction

## 2 Implementation Details

### 2.1 Brute-force k-NN

### 2.2 k-d Tree Construction and Querying

## 3 Performance Analysis

### 3.1 Expected Performance

### 3.2 Observed Performance

### 3.3 Explanation of Results

## 4 Correctness and Testing

### 4.1 Testing Methodology

### 4.2 Functional Correctness

## 5 Quality and Reliability

### 5.1 Memory Management

### 5.2 Known Limitations

## 6 Potential Improvements

## 7 Conclusion