



Design & Analysis of Algorithms

Project Submission 2

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Question 2 part 1

```
Generated 10 input files for Closest Pair.
```

Closest Pair Results

```
closest_points_1.txt → Closest distance = 32.6956  
closest_points_10.txt → Closest distance = 16.6433  
closest_points_2.txt → Closest distance = 27.2947  
closest_points_3.txt → Closest distance = 37.8550  
closest_points_4.txt → Closest distance = 22.0227  
closest_points_5.txt → Closest distance = 8.0623  
closest_points_6.txt → Closest distance = 41.0000  
closest_points_7.txt → Closest distance = 37.3631  
closest_points_8.txt → Closest distance = 26.0192  
closest_points_9.txt → Closest distance = 55.7315
```

```
Completed Closest Pair Execution.
```

```
PS E:\FAST\DAAS>
```

Question 2 part 2

```
Integer Multiplication using Karatsuba Algorithm
```

```
Generated 10 input files for Integer Multiplication.
```

Integer Multiplication Results

```
input_1.txt → Product length = 386 digits  
input_10.txt → Product length = 280 digits  
input_2.txt → Product length = 224 digits  
input_3.txt → Product length = 343 digits  
input_4.txt → Product length = 382 digits  
input_5.txt → Product length = 256 digits  
input_6.txt → Product length = 283 digits  
input_7.txt → Product length = 216 digits  
input_8.txt → Product length = 324 digits  
input_9.txt → Product length = 397 digits
```

```
Completed Integer Multiplication Execution.
```

```
PS E:\FAST\DAAS>
```

Question 3

```
==== Running Closest Pair Tests ====

closest_points_1.txt -> Closest Distance = 32.6956
closest_points_10.txt -> Closest Distance = 16.6433
closest_points_2.txt -> Closest Distance = 27.2947
closest_points_3.txt -> Closest Distance = 37.8550
closest_points_4.txt -> Closest Distance = 22.0227
closest_points_5.txt -> Closest Distance = 8.0623
closest_points_6.txt -> Closest Distance = 41.0000
closest_points_7.txt -> Closest Distance = 37.3631
closest_points_8.txt -> Closest Distance = 26.0192
closest_points_9.txt -> Closest Distance = 55.7315

==== Running Integer Multiplication Tests ====

input_1.txt -> 386 digits product
input_10.txt -> 280 digits product
input_2.txt -> 224 digits product
input_3.txt -> 343 digits product
input_4.txt -> 382 digits product
input_5.txt -> 256 digits product
input_6.txt -> 283 digits product
input_7.txt -> 216 digits product
input_8.txt -> 324 digits product
input_9.txt -> 397 digits product

Results saved to /results folder.
PS E:\FAST\DAA>
```

Question 4:



