



HÁSKÓLINN Í REYKJAVÍK  
REYKJAVIK UNIVERSITY

FALL 2021

T-301-REIR, REIKNIRIT

## S2: PATTERN RECOGNITION

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GROUP 1

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*Directions on performing the assignment are showed here in italics (like this). These should not be included in the report you submit.*

## 1 Implementation

### Brute force

*Explain briefly how you implemented brute force. Describe how you implemented `compareTo()` and the `slopeTo()` methods in the `Point` data type.*

### Sorting solution

*Explain briefly how you implemented the sorting solution. What steps did you do to avoid printing permutations and subsegments?*

## 2 Empirical Analysis

*Fill in the table below with actual running times in seconds when reasonable (say 180 seconds or less). You can round to the nearest tenth of a second.*

Table 1: !Insert caption!

$N$	brute	sorting
150	...	...
200	...	...
300	...	...
400	...	...
800	...	...
1600	...	...
3200	...	...
6400	...	...
12800	...	...

*Estimate (using tilde notation) the running time (in seconds) of your two main functions as a function of the number of points  $N$ . Explain how you derive any exponents.*

**Brute:**      $\sim$

**Sorting:**    $\sim$

### Theoretical

*Give the order of growth of the worst-case running time of your programs as a function of  $N$ . Justify your answer briefly.*

**Brute:**

**Sorting:**

### 3 About This Solution

Have you taken (part of) this course before:

Hours to complete assignment (optional):

#### 3.1 Known Bugs / Limitations.

*Known bugs / limitations. For example, if your program prints out different representations of the same line segment when there are 5 or more points on a line segment, indicate that here.*

#### 3.2 Help Received

*Describe whatever help (if any) that you received. Don't include readings, lectures, and classes, but do include any help from people (including course staff, lab TAs, classmates, and friends) and attribute them by name.*

#### 3.3 Problem Encountered

*Describe any serious problems you encountered.*

#### 3.4 Comments

*List any other comments here. Feel free to provide any feedback on how much you learned from doing the assignment, and whether you enjoyed doing it.*