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| http://www.hcmus.edu.vn/images/stories/logo-khtn2009_transparency.png | **CS350 – Algorithms and Complexity** |  |

Class: APCS 2013

Date: May 10 – May 22, 2016

**Personal Report**

**Student ID: 1351026**

**Student’s full name: Hoàng Khôi**

**Email: hkhoi@apcs.vn**

**Tel:**

 **Directions:**

* Each student is expected to practise with 10 problems from codeforces.com (or similar programming contest sites).
* Each student can freely choose 10 problems to practice.
* For each problem, each student can submit multiple solutions. The student is required to present in details only one best solution for each problem.

# Submission Overview

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| --- |
| ** Directions:**  Please present the overview of your submissions for 10 problems.   * **URL of Problem (Column A)**: URL (in codeforces.com) of the problem you solve * **Note (Column B)**: Please check [x] on the most appropriate option (please be honest ).   + I solve the problem by myself without any reference: You choose this option when you manually solve the problem by yourself and do not read the tutorial, hint, or existing solutions.   + I solve the problem by myself after reading some reference: You choose this option when you manually write the program to solve the problem by yourself after you read the tutorial, hint, or existing solutions.   + I reuse an existing solution but I understand it : You choose this option when you just copy an existing solution. It is essential that you MUST read and understand the source code that you submit. * **Result (Column C)**: Please check [x] on the appropriate result of your final submission for the problem. If your final submission is still not accepted, please give the reason for this failure. |

| **No** | **URL of Problem**  **(A)** | **Note**  **(B)** | **Result**  **(C)** |
| --- | --- | --- | --- |
| 1 | https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&page=show\_problem&problem=1130 | [ x ] I solve the problem by myself without any reference  [ ] I solve the problem by myself after reading some reference  [ ] I reuse an existing solution but I understand it. | [ x ] Accepted  [ ] Not accepted  Reason: …................... |
| 2 | https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&page=show\_problem&category=24&problem=1886&mosmsg=Submission+received+with+ID+17398910 | [ x ] I solve the problem by myself without any reference  [ ] I solve the problem by myself after reading some reference  [ ] I reuse an existing solution but I understand it. | [ x ] Accepted  [ ] Not accepted  Reason: …................... |
| 3 | https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&page=show\_problem&category=24&problem=2261&mosmsg=Submission+received+with+ID+17399143 | [ ] I solve the problem by myself without any reference  [ ] I solve the problem by myself after reading some reference  [ ] I reuse an existing solution but I understand it. | [ x ] Accepted  [ ] Not accepted  Reason: …................... |
| 4 | https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&page=show\_problem&category=24&problem=2949&mosmsg=Submission+received+with+ID+17399203 | [x] I solve the problem by myself without any reference  [ ] I solve the problem by myself after reading some reference  [ ] I reuse an existing solution but I understand it. | [x] Accepted  [ ] Not accepted  Reason: …................... |
| 5 | https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&category=24&page=show\_problem&problem=3139 | [x] I solve the problem by myself without any reference  [ ] I solve the problem by myself after reading some reference  [ ] I reuse an existing solution but I understand it. | [x] Accepted  [ ] Not accepted  Reason: …................... |
| 6 | https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&category=24&page=show\_problem&problem=728 | [x] I solve the problem by myself without any reference  [ ] I solve the problem by myself after reading some reference  [ ] I reuse an existing solution but I understand it. | [x] Accepted  [ ] Not accepted  Reason: …................... |
| 7 | https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&category=24&page=show\_problem&problem=1625 | [x] I solve the problem by myself without any reference  [ ] I solve the problem by myself after reading some reference  [ ] I reuse an existing solution but I understand it. | [x] Accepted  [ ] Not accepted  Reason: …................... |
| 8 | https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&page=show\_problem&category=24&problem=293&mosmsg=Submission+received+with+ID+17401121 | [x] I solve the problem by myself without any reference  [ ] I solve the problem by myself after reading some reference  [ ] I reuse an existing solution but I understand it. | [x] Accepted  [ ] Not accepted  Reason: …................... |
| 9 | https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&category=24&page=show\_problem&problem=1055 | [x] I solve the problem by myself without any reference  [ ] I solve the problem by myself after reading some reference  [ ] I reuse an existing solution but I understand it. | [x] Accepted  [ ] Not accepted  Reason: …................... |
| 10 | https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&category=24&page=show\_problem&problem=2502 | [x] I solve the problem by myself without any reference  [ ] I solve the problem by myself after reading some reference  [ ] I reuse an existing solution but I understand it. | [x] Accepted  [ ] Not accepted  Reason: …................... |

# Problem 01

***Please note: There is no submission link for UVa Online Judge, so I have to push the solution to GitHub.***

*Please fill in the URL of the problem in Codeforces.com*

**URL of problem: https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&page=show\_problem&problem=1130**

*Please fill in the URL of your submission in Codeforces.com*

**URL of submission: https://github.com/hkhoi-coder/CS350/blob/master/UVa10189.java**

*Please check into the most appropriate option for this submission:*

[ x ] **I solve the problem by myself without any reference**

[ ] **I solve the problem by myself after reading some reference**

*Please list all reference links (tutorial, hint, existing solutions, etc):*

[ ] **I reuse an existing solution but I understand it**.

*The URL of existing solution:*

* **Result:**

*Please fill in the appropriate option on the result of of your submission in Codeforces.com*

[ x ] Accepted [ ] Not accepted

Number of accepted tests:……… /Total number of tests: ………

*Present the key idea to solve this problem:*

Easy simulation problem, the only bugs that could arise is array bound error

*If there are tests that your solution cannot solve successfully, please present one test. Do you have any idea on the reason why your solution cannot solve it?*

# Problem 02

*Please fill in the URL of the problem in Codeforces.com*

**URL of problem: https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&page=show\_problem&category=24&problem=1886&mosmsg=Submission+received+with+ID+17398910**

*Please fill in the URL of your submission in Codeforces.com*

**URL of submission: https://github.com/hkhoi-coder/CS350/blob/master/UVa10945.java**

*Please check into the most appropriate option for this submission:*

[ x ] **I solve the problem by myself without any reference**

[ ] **I solve the problem by myself after reading some reference**

*Please list all reference links (tutorial, hint, existing solutions, etc):*

[ ] **I reuse an existing solution but I understand it**.

*The URL of existing solution:*

* **Result:**

*Please fill in the appropriate option on the result of of your submission in Codeforces.com*

[ x ] Accepted [ ] Not accepted

Number of accepted tests:……… /Total number of tests: ………

*Present the key idea to solve this problem:*

The idea is simple, we append all alphabetic characters into a StringBuilder and then make it into lower-case string, then check if it is palindrome or not (using two ‘pointers’ at two ends, run towards each other)

*If there are tests that your solution cannot solve successfully, please present one test. Do you have any idea on the reason why your solution cannot solve it?*

# Problem 03

*Please fill in the URL of the problem in Codeforces.com*

**URL of problem: https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&page=show\_problem&category=24&problem=2261&mosmsg=Submission+received+with+ID+17399143**

*Please fill in the URL of your submission in Codeforces.com*

**URL of submission: https://github.com/hkhoi-coder/CS350/blob/master/UVa11286.java**

*Please check into the most appropriate option for this submission:*

[ x ] **I solve the problem by myself without any reference**

[ ] **I solve the problem by myself after reading some reference**

*Please list all reference links (tutorial, hint, existing solutions, etc):*

[ ] **I reuse an existing solution but I understand it**.

*The URL of existing solution:*

* **Result:**

*Please fill in the appropriate option on the result of of your submission in Codeforces.com*

[ x ] Accepted [ ] Not accepted

Number of accepted tests:……… /Total number of tests: ………

*Present the key idea to solve this problem:*

Nothing much, the key is to use Map and Set elegantly!

*If there are tests that your solution cannot solve successfully, please present one test. Do you have any idea on the reason why your solution cannot solve it?*

# Problem 04

*Please fill in the URL of the problem in Codeforces.com*

**URL of problem: https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&page=show\_problem&category=24&problem=2949&mosmsg=Submission+received+with+ID+17399203**

*Please fill in the URL of your submission in Codeforces.com*

**URL of submission: https://github.com/hkhoi-coder/CS350/blob/master/UVa11849.java**

*Please check into the most appropriate option for this submission:*

[x] **I solve the problem by myself without any reference**

[ ] **I solve the problem by myself after reading some reference**

*Please list all reference links (tutorial, hint, existing solutions, etc):*

[ ] **I reuse an existing solution but I understand it**.

*The URL of existing solution:*

* **Result:**

*Please fill in the appropriate option on the result of of your submission in Codeforces.com*

[ ] Accepted [ ] Not accepted

Number of accepted tests:……… /Total number of tests: ………

*Present the key idea to solve this problem:*

Use java.util.HashSet to check for duplications

*If there are tests that your solution cannot solve successfully, please present one test. Do you have any idea on the reason why your solution cannot solve it?*

# Problem 05

*Please fill in the URL of the problem in Codeforces.com*

**URL of problem: https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&category=24&page=show\_problem&problem=3139**

*Please fill in the URL of your submission in Codeforces.com*

**URL of submission: https://github.com/hkhoi-coder/CS350/blob/master/UVa11988.java**

*Please check into the most appropriate option for this submission:*

[x] **I solve the problem by myself without any reference**

[ ] **I solve the problem by myself after reading some reference**

*Please list all reference links (tutorial, hint, existing solutions, etc):*

[ ] **I reuse an existing solution but I understand it**.

*The URL of existing solution:*

* **Result:**

*Please fill in the appropriate option on the result of of your submission in Codeforces.com*

[x] Accepted [ ] Not accepted

Number of accepted tests:……… /Total number of tests: ………

*Present the key idea to solve this problem:*

Key idea is to use doubly linked list of string or java.util.StringBuilder

*If there are tests that your solution cannot solve successfully, please present one test. Do you have any idea on the reason why your solution cannot solve it?*

# Problem 06

*Please fill in the URL of the problem in Codeforces.com*

**URL of problem: https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&category=24&page=show\_problem&problem=728**

*Please fill in the URL of your submission in Codeforces.com*

**URL of submission: https://github.com/hkhoi-coder/CS350/blob/master/UVa00787.java**

*Please check into the most appropriate option for this submission:*

[x] **I solve the problem by myself without any reference**

[ ] **I solve the problem by myself after reading some reference**

*Please list all reference links (tutorial, hint, existing solutions, etc):*

[ ] **I reuse an existing solution but I understand it**.

*The URL of existing solution:*

* **Result:**

*Please fill in the appropriate option on the result of of your submission in Codeforces.com*

[x] Accepted [ ] Not accepted

Number of accepted tests:……… /Total number of tests: ………

*Present the key idea to solve this problem:*

Let’s call F[x][y] = Product from Array[x] to Array[y]

F[x][y] = Array[x] when x == y

F[x][y] = F[x][y – 1]\*Array[y]

For each F[x][y] calculated, let max = MAX(F[x][y], max]

Result to be returned is max

*If there are tests that your solution cannot solve successfully, please present one test. Do you have any idea on the reason why your solution cannot solve it?*

# Problem 07

*Please fill in the URL of the problem in Codeforces.com*

**URL of problem: https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&category=24&page=show\_problem&problem=1625**

*Please fill in the URL of your submission in Codeforces.com*

**URL of submission: https://github.com/hkhoi-coder/CS350/blob/master/UVa10684.java**

*Please check into the most appropriate option for this submission:*

[ ] **I solve the problem by myself without any reference**

[ ] **I solve the problem by myself after reading some reference**

*Please list all reference links (tutorial, hint, existing solutions, etc):*

[ ] **I reuse an existing solution but I understand it**.

*The URL of existing solution:*

* **Result:**

*Please fill in the appropriate option on the result of of your submission in Codeforces.com*

[x] Accepted [ ] Not accepted

Number of accepted tests:……… /Total number of tests: ………

*Present the key idea to solve this problem:*

This is the problem of finding maximum sum of consecutive elements in an array. To solve, use improved Kadane’s algorithm

*If there are tests that your solution cannot solve successfully, please present one test. Do you have any idea on the reason why your solution cannot solve it?*

# Problem 08

*Please fill in the URL of the problem in Codeforces.com*

**URL of problem: https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&page=show\_problem&category=24&problem=293&mosmsg=Submission+received+with+ID+17401121**

*Please fill in the URL of your submission in Codeforces.com*

**URL of submission: https://github.com/hkhoi-coder/CS350/blob/master/UVa00357.java**

*Please check into the most appropriate option for this submission:*

[x] **I solve the problem by myself without any reference**

[ ] **I solve the problem by myself after reading some reference**

*Please list all reference links (tutorial, hint, existing solutions, etc):*

[ ] **I reuse an existing solution but I understand it**.

*The URL of existing solution:*

* **Result:**

*Please fill in the appropriate option on the result of of your submission in Codeforces.com*

[ ] Accepted [ ] Not accepted

Number of accepted tests:……… /Total number of tests: ………

*Present the key idea to solve this problem:*

This is exactly a class Dynamic Programming problem (coin exchange).

Given n cents, create an array table[n + 1].

For each type of currency (penny, dime, quarter…) we apply this formula:

table[i] = table[i – currency] : i > currency

*If there are tests that your solution cannot solve successfully, please present one test. Do you have any idea on the reason why your solution cannot solve it?*

# Problem 09

*Please fill in the URL of the problem in Codeforces.com*

**URL of problem: https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&category=24&page=show\_problem&problem=1055**

*Please fill in the URL of your submission in Codeforces.com*

**URL of submission: https://github.com/hkhoi-coder/CS350/blob/master/UVa10114.java**

*Please check into the most appropriate option for this submission:*

[x] **I solve the problem by myself without any reference**

[ ] **I solve the problem by myself after reading some reference**

*Please list all reference links (tutorial, hint, existing solutions, etc):*

[ ] **I reuse an existing solution but I understand it**.

*The URL of existing solution:*

* **Result:**

*Please fill in the appropriate option on the result of of your submission in Codeforces.com*

[x] Accepted [ ] Not accepted

Number of accepted tests:……… /Total number of tests: ………

*Present the key idea to solve this problem:*

This is a pure and quite complicated simulation problem, follow the process and implement it with care

*If there are tests that your solution cannot solve successfully, please present one test. Do you have any idea on the reason why your solution cannot solve it?*

# Problem 10

*Please fill in the URL of the problem in Codeforces.com*

**URL of problem: https://uva.onlinejudge.org/index.php?option=com\_onlinejudge&Itemid=8&category=24&page=show\_problem&problem=2502**

*Please fill in the URL of your submission in Codeforces.com*

**URL of submission: https://github.com/hkhoi-coder/CS350/blob/master/UVa11507.java**

*Please check into the most appropriate option for this submission:*

[x] **I solve the problem by myself without any reference**

[ ] **I solve the problem by myself after reading some reference**

*Please list all reference links (tutorial, hint, existing solutions, etc):*

[ ] **I reuse an existing solution but I understand it**.

*The URL of existing solution:*

* **Result:**

*Please fill in the appropriate option on the result of of your submission in Codeforces.com*

[x] Accepted [ ] Not accepted

Number of accepted tests:……… /Total number of tests: ………

*Present the key idea to solve this problem:*

Simulation process, to solve this, we need carefulness, imagination and implementation skills, that’s all!

*If there are tests that your solution cannot solve successfully, please present one test. Do you have any idea on the reason why your solution cannot solve it?*