

Name: \_\_\_\_\_

**Learning Activity**

Last 3-Digit ID: \_\_\_\_\_

--	--	--

**Homework #1. Submit in MyCourse.**

Must **type** your solution (handwritten texts are **not** acceptable)

- All solutions are in one file (PDF), with your Full Name in file name.
- Source code is submitted separately as another file

**Problem 1. Matching Residents to Hospitals – Extension of GS algorithm**

**Problem description:** Chapter 1, Exercise 4. Page 23.

1. Give an algorithm to find one. Your solution must include the following components:
  - a. A brief overview of the key idea of this algorithm in English description.
  - b. A presentation of this algorithm in pseudo code with similar format and same level of details as GS algorithm on Page 6.
2. Show that this algorithm does returns a stable assignment of students to hospitals.  
[Following the example of proof (1.6) on page 8 in textbook]

**Problem 2. Implementation of Propose-and-Reject Algorithms**

1. Implement the proposal-and-reject algorithm in Chapter 1, page 6, using the programming language you choose **and** the efficient implementation techniques described on Lecture notes (Slide 23, 24 on page 11).
2. Apply the algorithm to the problem instance on the right side. Assuming your program starting with Man from Victor to Zeus, report the solution found.
3. Now change the order of selecting Man to proposal from Zeus to Victor, report the solution found.
4. Modify your program so that women are proposing to men, in order of from Amy to Erika, report the solution found.

*Men's Preference Profile*

	0 <sup>th</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>
Victor	Bertha	Amy	Diane	Erika	Clare
Wyatt	Diane	Bertha	Amy	Clare	Erika
Xavier	Bertha	Erika	Clare	Diane	Amy
Yancey	Amy	Diane	Clare	Bertha	Erika
Zeus	Bertha	Diane	Amy	Erika	Clare

*Women's Preference Profile*

	0 <sup>th</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>
Amy	Zeus	Victor	Wyatt	Yancey	Xavier
Bertha	Xavier	Wyatt	Yancey	Victor	Zeus
Clare	Wyatt	Xavier	Yancey	Zeus	Victor
Diane	Victor	Zeus	Yancey	Xavier	Wyatt
Erika	Yancey	Wyatt	Zeus	Xavier	Victor

Exercise Type: Preparation

In Class

Practice

Grade Type: Just for fun

Boolean

Numeric

Submission time: \_\_\_\_\_

Graded By: \_\_\_\_\_

Grade: \_\_\_\_\_