

CSE 5319/6319 Homework 3

Due April 3, 5:00 p.m. on Canvas

1. Show that the following instance of stable marriages has two stable matchings. (15 points)

<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
5	2	3	3	3	A	E	A	B	B
1	3	5	1	2	D	B	B	E	D
3	5	4	2	4	C	A	C	C	A
4	4	1	4	5	B	C	E	A	E
2	1	2	5	1	E	D	D	D	C

2. Find three maximum-cardinality, pareto-optimal solutions for the following instance of house allocation. (25 points)

A1: H3 H4 H5 H2 H1

A2: H1 H2 H5 H4 H3

A3: H5 H1 H4 H2 H3

A4: H3 H4 H2 H1 H5

A5: H5 H3 H2 H4 H1

3. A man dies, leaving an estate worth \$550. The deceased has three widows with marriage contracts of \$125, \$225, and \$325. Divide the estate among the widows, using the Rule of Linked Vessels. (15 points)
4. Solve problem 3 using the O'Neill's law/race-to-the-bank method (Shapley Value). (15 points)
5. A man dies, leaving an estate worth \$275. The deceased has three widows with marriage contracts of \$50, \$100, and \$200. Divide the estate among the widows, using the Rule of Linked Vessels. (15 points)
6. Solve problem 5 using the O'Neill's law/race-to-the-bank method (Shapley Value). (15 points)