2.3 Consider the following normal form game.

	t_1	t_2	t ₃	t ₄	t_5
<i>s</i> ₁	0,100	0,100	0,100	0,100	0,100
<i>s</i> ₂	81, 19	20,80	20,80	20,80	20,80
s 3	81, 19	49,51	40,60	40,60	40,60
<i>S</i> ₄	81, 19	49, 51	25,75	60,40	60,40
<i>S</i> ₅	81, 19	49,51	25,75	9,91	80, 20
<i>s</i> ₆	81, 19	49,51	25,75	9,91	1,99

a) Determine all strictly dominant strategies.

There are no strictly dominant strategies.

2.3 Consider the following normal form game.

	t_1	t ₂	t ₃	t ₄	t ₅
<i>s</i> ₁	0,100	0, 100	0, 100	0, 100	0,100
s ₂	81, 19	20,80	20,80	20,80	20,80
s 3	81, 19	49,51	40,60	40,60	40,60
<i>S</i> ₄	81, 19	49,51	25,75	60,40	60,40
<i>S</i> 5	81, 19	49,51	25,75	9,91	80, 20
<i>s</i> ₆	81, 19	49,51	25,75	9,91	1,99

b) Determine all weakly dominant strategies.

There are no weakly dominant strategies.

2.3 Consider the following normal form game.

	t_1	t_2	t ₃	t ₄	t_5
s_1	0,100	0,100	0,100	0,100	0,100
<i>s</i> ₂	81, 19	20,80	20,80	20,80	20,80
s 3	81, 19	49, 51	40,60	40,60	40,60
<i>S</i> ₄	81, 19	49,51	25,75	60,40	60,40
<i>S</i> ₅	81, 19	49,51	25,75	9,91	80, 20
<i>s</i> ₆	81, 19	49,51	25,75	9,91	1,99

c) Determine all strictly dominated strategies.

Strategy s_1 is strictly dominated by all other strategies of player 1. By 2.2, every mixed strategy that plays s_1 with positive probability is also strictly dominated.

2.3 Consider the following normal form game.

	t_1	t_2	t ₃	t ₄	t_5
s_1	0,100	0,100	0,100	0,100	0,100
s ₂	81, 19	20,80	20,80	20,80	20,80
s 3	81, 19	49,51	40,60	40,60	40,60
<i>S</i> ₄	81, 19	49,51	25,75	60,40	60,40
<i>S</i> 5	81, 19	49, 51	25,75	9,91	80, 20
<i>s</i> ₆	81, 19	49,51	25,75	9,91	1,99

d) Determine all weakly dominated strategies.

The strategies s_1 , s_2 and s_6 are weakly dominated.

The strategies t_1 and t_2 are weakly dominated.

All mixed strategies that play a weakly dominated strategy with positive probability are also weakly dominated.

2.3 Consider the following normal form game.

	t_1	t_2	t_3	t_4	t_5
s_1	0,100	0,100	0,100	0,100	0,100
s ₂	81, 19	20,80	20,80	20,80	20,80
s 3	81, 19	49,51	40,60	40,60	40,60
<i>S</i> ₄	81, 19	49,51	25,75	60,40	60,40
<i>S</i> ₅	81, 19	49,51	25,75	9,91	80, 20
<i>s</i> ₆	81, 19	49,51	25,75	9,91	1,99

e) Determine which strategies survive the iterative elimination of weakly dominated strategies.

 s_1 is weakly dominated \Rightarrow Eliminate s_1 .

2.3 Consider the following normal form game.

	t_1	t_2	t ₃	t ₄	t_5
<i>s</i> ₂	81, 19	20,80	20,80	20,80	20,80
<i>s</i> ₃	81, 19	49,51	40,60	40,60	40,60
<i>S</i> ₄	81, 19	49,51	25,75	60,40	60,40
<i>S</i> 5	81, 19	49,51	25,75	9,91	80, 20
<i>s</i> ₆	81, 19	49,51	25,75	9,91	1,99

 t_1 is weakly dominated \Rightarrow Eliminate t_1 .

2.3 Consider the following normal form game.

	t_2	t ₃	t ₄	t_5
<i>s</i> ₂	20,80	20,80	20,80	20,80
<i>s</i> ₃	49,51	40,60	40,60	40,60
<i>S</i> 4	49,51	25,75	60,40	60,40
<i>S</i> 5	49,51	25,75	9,91	80,20
<i>s</i> ₆	49,51	25,75	9,91	1,99

 s_2 is weakly dominated \Rightarrow Eliminate s_2 .

2.3 Consider the following normal form game.

	t_2	t ₃	t ₄	<i>t</i> ₅
s ₃	49,51	40,60	40,60	40,60
<i>S</i> ₄	49,51	25,75	60,40	60,40
<i>S</i> ₅	49,51	25,75	9,91	80, 20
<i>s</i> ₆	49,51	25,75	9,91	1,99

 t_2 is weakly dominated \Rightarrow Eliminate t_2 .

2.3 Consider the following normal form game.

	t ₃	t ₄	t_5
s ₃	40,60	40,60	40,60
<i>S</i> ₄	25,75	60,40	60,40
<i>S</i> 5	25,75	9,91	80, 20
<i>s</i> ₆	25,75	9,91	1,99

 s_6 is weakly dominated \Rightarrow Eliminate s_6 .

2.3 Consider the following normal form game.

		t ₃	t ₄	<i>t</i> ₅
s ₃		40,60	40,60	40,60
<i>S</i> ₄		25,75	60,40	60,40
<i>S</i> 5		25,75	9,91	80, 20

 t_5 is weakly dominated \Rightarrow Eliminate t_5 .

2.3 Consider the following normal form game.

		t ₃	t ₄	
s ₃		40,60	40,60	
<i>S</i> ₄		25,75	60,40	
<i>S</i> ₅		25,75	9,91	

 s_5 is weakly dominated \Rightarrow Eliminate s_5 .

2.3 Consider the following normal form game.

		t ₃	t ₄	
<i>s</i> ₃		40,60	40,60	
<i>S</i> 4		25,75	60,40	
		·		

 t_4 is weakly dominated \Rightarrow Eliminate t_4 .

2.3 Consider the following normal form game.

		t ₃	
<i>s</i> ₃		40,60 25,75	
<i>S</i> ₄		25,75	

 s_4 is weakly dominated \Rightarrow Eliminate s_4 .

2.3 Consider the following normal form game.

		<i>t</i> ₃	
<i>s</i> ₃		40,60	

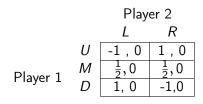
The strategies s_3 and t_3 are the only strategies that survive the iterative elimination of weakly dominated strategies.

Rationalizable Strategies: Definition

Definition (Rationalizable Strategies)

In game $\Gamma_N = [I, \{\Delta(S_i)\}, \{u_i(\cdot)\}]$, the strategies in $\Delta(S_i)$ that survive the iterated elimination of strategies that are never a best response are known as player i's rationalizable strategies.

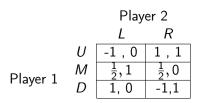
Rationalizable Strategies



What are the rationalizable strategies? U is best response to R and D is best response to L. M is not a best response to a pure strategy, but to the mixed strategy

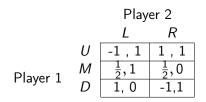
M is not a best response to a pure strategy, but to the mixed strategy (1/2L+1/2R).

Rationalizable Strategies



A mixed strategy can only be a best-response to s_{-i} if all pure strategies that are played with positive probability are a best-response to s_{-i} .

Rationalizable Strategies



A mixed strategy can only be a best-response if all pure strategies that are played with positive probability are a best-response given the same strategy profile of the others.

2.3 Consider the following normal form game.

	t_1	t ₂	t ₃	t ₄	t_5
<i>s</i> ₁	0,100	0,100	0,100	0,100	0,100
<i>s</i> ₂	81, 19	20,80	20,80	20,80	20,80
<i>s</i> ₃	81, 19	49,51	40,60	40,60	40,60
<i>S</i> ₄	81, 19	49, 51	25,75	60,40	60,40
<i>S</i> 5	81, 19	49, 51	25,75	9,91	80, 20
<i>s</i> ₆	81, 19	49,51	25,75	9,91	1,99

f) Determine all rationalizable strategies.

2.3 Consider the following normal form game.

	t_1	t_2	t ₃	t ₄	t_5
s_1	0, 100	0, 100	0, <u>100</u>	0, 100	0, 100
<i>s</i> ₂	<u>81, 19</u>	20,80	20, <u>80</u>	20,80	20,80
s 3	<u>81,</u> 19	<u>49,</u> 51	<u>40,60</u>	40, <u>60</u>	40, <u>60</u>
<i>S</i> ₄	<u>81,</u> 19	<u>49</u> , 51	25, <u>75</u>	<u>60</u> , 40	60,40
<i>S</i> ₅	<u>81,</u> 19	<u>49,</u> 51	25,75	9, <u>91</u>	<u>80</u> , 20
<i>s</i> ₆	<u>81, 19</u>	<u>49, 51</u>	25,75	9,91	1, 99

 s_1 is never a best response \Rightarrow Eliminate s_1 .

2.3 Consider the following normal form game.

	t_1	t ₂	t ₃	t ₄	t_5
s_1					
<i>s</i> ₂	<u>81,</u> 19	20, <u>80</u>	20, <u>80</u>	20, <u>80</u>	20, <u>80</u>
<i>s</i> ₃	<u>81</u> , 19	<u>49, 51</u>	<u>40,60</u>	40, <u>60</u>	40, <u>60</u>
<i>S</i> ₄	<u>81, 19</u>	<u>49, 51</u>	25, <u>75</u>	<u>60</u> , 40	60,40
<i>S</i> 5	<u>81,</u> 19	<u>49,</u> 51	25,75	9, <u>91</u>	<u>80</u> , 20
<i>s</i> ₆	<u>81,</u> 19	<u>49,</u> 51	25,75	9,91	1, <u>99</u>

 t_1 is never a best response \Rightarrow Eliminate t_1 .

2.3 Consider the following normal form game.

	t_1	t ₂	t ₃	t ₄	<i>t</i> ₅
s_1					
s ₂		20, <u>80</u>	20, <u>80</u>	20, <u>80</u>	20,80
s ₃		<u>49, 51</u>	<u>40,60</u>	40, <u>60</u>	40, <u>60</u>
<i>S</i> ₄		<u>49, 51</u>	25, <u>75</u>	<u>60</u> , 40	60,40
<i>S</i> 5		<u>49,</u> 51	25,75	9, <u>91</u>	<u>80</u> , 20
<i>s</i> ₆		<u>49,</u> 51	25,75	9,91	1, 99

 s_2 is never a best response \Rightarrow Eliminate s_2 .

2.3 Consider the following normal form game.

	t_1	t ₂	t ₃	t ₄	t_5
s_1					
<i>s</i> ₂					
<i>s</i> ₃		<u>49,</u> 51	<u>40, 60</u>	40, <u>60</u>	40, <u>60</u>
<i>S</i> ₄		<u>49, 51</u>	25, <u>75</u>	<u>60</u> , 40	60,40
<i>S</i> 5		<u>49,</u> 51	25,75	9, <u>91</u>	<u>80</u> , 20
<i>s</i> ₆		<u>49,</u> 51	25,75	9,91	1, 99

 t_2 is never a best response \Rightarrow Eliminate t_2 .

2.3 Consider the following normal form game.

	t_1	t_2	t ₃	t ₄	<i>t</i> ₅
<i>s</i> ₁					
s ₂					
s ₃			<u>40, 60</u>	40, <u>60</u>	40, <u>60</u>
<i>S</i> ₄			25, <u>75</u>	<u>60</u> , 40	60,40
<i>S</i> ₅			25,75	9, <u>91</u>	<u>80</u> , 20
<i>s</i> ₆			25,75	9,91	1, 99

 s_6 is never a best response \Rightarrow Eliminate s_6 .

2.3 Consider the following normal form game.

	t_1	t_2	<i>t</i> ₃	t ₄	<i>t</i> ₅
s_1					
<i>s</i> ₂					
<i>s</i> ₃			<u>40,60</u>	40, <u>60</u>	40, <u>60</u>
<i>S</i> ₄			25, <u>75</u>	<u>60</u> , 40	60,40
<i>S</i> 5			25,75	9, <u>91</u>	<u>80,</u> 20
<i>s</i> ₆					

The strategies s_3 , s_4 , s_5 , t_3 , t_4 and t_6 are the rationalizable strategies.