Titanic(3D)

We based our game on the movie, Titanic(3D) , specifically the part where the ship is sinking and both, Rose and Jack are in the ocean with no help at hand.
In the ocean they find a wooden door which rose climbs onto in order to stay alive.
Here is where our game starts as we are posed with the following choices:-

A. Both climb onto the door to save themselves.
B. Jack stays in the water and lets Rose lie on the door
C. Rose stays in the water and lets Jack lie on the door
D. Both are selfless and do not climb onto the door.

Now remember, in the movie when Jack tried to climb the door with Rose, the door had started to sink, thus showing that it is not buoyant enough to support both of them ie. If both climb the door, they both die.

We assigned the points as follows-
Love- 2 points
Living – 1 point

In the first case where both climb the door to save themselves, they are both being selfish (thus 0 for love) and they both subsequently die as the wood cannot support them.(0 for living)
Thus the points are **(0,0)**

In the second case Jack stays in the water and lets Rose lie on the door.
Here Jack is selfless(2 points for love) but dies(0 for living) his payoff is thus 2.
Rose climbs the door, while Jack remains in the water (thus 0 for love) but she lives(1 for living). Her payoff is 1. Thus the points are **(2,1)**

In the third case Rose stays in the water and lets Jack lie on the door.
Here Rose is selfless(2 points for love) but dies(0 for living) her payoff is thus 2.
Jack climbs the door, while Rose remains in the water (thus 0 for love) but he lives(1 for living). His payoff is 1. Thus the points are **(1,2)**

In the fourth and final case both end up in the water and not on the door and thus die. 0 for living but 2 for love. The points are **(2,2)**

With this we have the final payoff matrix ready which is :-

		JACK	
		On the Plank	Not on the Plank
ROSE	On the Plank	(0,0)	(1,2)
	Not on the Plank	(2,1)	(2,2)

Why does it classify as a game?

The game is played simultaneously between the two players, where each player's decisions affect the other player's outcome.

If Jack had got onto the wooden door, Rose would die irrespective of whether she stayed in the water or got onto the wood. But Jack's living or dying depended on what Rose did.

Thus it is interdependent.

What are it's main characteristics?

Players:

An individual/group of individuals that take co-ordinated decisions i.e. behave in a similar fashion.

Here, the players are Jack and Rose.

Strategies:

Complete set of decisions / actions taken by the players.

In our game, the strategies are-

1. Climbing onto the plank (P)
2. Not climbing onto the plank and staying in the water. (N)

Payoffs:

Outcomes(gains/losses) as a result of strategic combination. It can be in monetary or utility terms.

Here , the payoffs are already mentioned above.

Preferences:

A player's ranking by various possible payoffs.

For Jack- U1(N,N)=U1(N,P)>U1(P,P)>U1(P,P)

For Rose-

U2(N,N)=U2(N,P)>U2(P,P)>U2(P,P)

Hence, the preferences are symmetric.

Decision-making and knowledge:

The mode of decision making is simultaneous and players have complete knowledge of what are the consequences of a particular action.

Symmetricity:
The game does have symmetric preferences

Optimality of Nash Equilibrium:
The Nash Equilibrium (2,2) where both the players decide to not climb onto the plank is OPTIMAL. Player do not have an incentive to deviate from the same. However, in the movie Rose stays on the plank and Jack remains in the water and dies.

Dominant Stategy:
The game also has a Dominant Strategy where players choose not climbing onto the plank in every scenario.

Therefore, the game **does not represent Prisoner's Dilemma.**

Can you represent the payoffs somehow?

		JACK	
		On the Plank	Not on the Plank
ROSE	On the Plank	(0,0)	(1,2)
	Not on the Plank	(2,1)	(2,2)

This is the payoff where love is worth 2 points and living is worth 1.

What was the conclusion observed? Can you compare this to what the theoretical payoffs indicate?
From the above game, we have concluded that both Rose and Jack would theoretically prefer to be off the door and into the water for the most optimal solution for both of them(2,2). But since they didn't stick to the most optimal solution, it had consequences and hence Rose had to deal with emotional pain for the rest of her life.

Group assignment(3 Marks)

Q1
(a) In the first round, find & write the combination of strategies that earns you the maximum score (i.e., 49).

Opponent 1
Cooperate, Cooperate, Cooperate, Cooperate, Cheat

Opponent 2
Cheat, Cheat, Cheat, Cheat, Cheat

Opponent 3
Cheat, Cheat, Cheat, Cheat, Cheat

Opponent 4
Cooperate, Cooperate, Cooperate, Cooperate, Cheat

Opponent 5
Cheat,Cheat,Cheat,Cooperate,Cooperate,Cooperate,Cheat

(b) Compare this with the theoretical Nash equilibrium in each period, and comment on the reason for any differences arising from the nature of your opponent.

The theoretical Nash equilibrium is to cheat for both the players. This is sub-optimal and the dominant strategy for both of them as cooperating gets them a higher payoff.
Since it is also symmetric it resembles the prisoner's dilemma.
Now the nature of the players influences our decision-making and always cheat is no longer the best strategy if this very nature is known beforehand.
For example against copycat , we should cooperate so that he copies and cooperates back,that is until the last round. Now we should cheat as he cannot copy us(no next round)
In front of always cheat we should also always cheat.
Same principle in front of always cooperate as no matter what we do, she will always choose to give the coin and cheating gets us the maximum benefit.

The same strategy should be followed against the grudger as against copycat

Now the detective is complicated,
We should Cheat,Cheat,Cheat,Cooperate,Cooperate,Cooperate,Cheat

Q2 In the ‘Sandbox’ mode, change any one variable among the three possibilities available to you, & examine. Try to analyse the payoff result for any one ‘step’.

In the sandbox mode while keeping all other components to default setting where, we have :

Copycat	3	Cheater	3
Cooperator	3	Grudger	3
Detective	3	Copy kitten	3
Simpleton	3	Random	4

The payoff remains the same, and in the set of rules number of rounds remain unchange as 10, the chance of error also remains unchanged as 5%.

In our sandbox box we are changing after each tournament , Eliminate the bottom 7 players instead of 5 and reproduce the top 7 players instead of 5 .

When eliminating bottom 5 and reproducing top 5 , when multiple simulation are done it can be said that either Simpleton or copy kitten only win , this mainly because simpleton can exploite always cooperate by starting with cooperating and eventually end up cheating and copy kitten wins because its a more forgiving version of copycat as in copy cat it always copies but copykitten gives a chance to cooperate .
Whereas when we changed the number of people from 5 to 7 , we observed an almost similar result in which copykitten won most of the times but simpleton also won in some simulations .
After running multiple simulations we can observe that the results havnt changed drastically even though in the “7” we can observe that copykitten wins more .

Copykitten has shown the most potential to win , as earlier we observed that copycat wins most of the group simulations but now copy kitten is a more smarter version of copycat as it not only cooperates with the other player but if the other player tries to cheat intentionally or by mistake it cheats them after 2 tries which lets the other player change their strategy back to cooperate .
Hence there isn’t much difference in both the results as the dominant player which is copykitten still wins in greater number of rounds also and so does simpleton as it is an almost same version of copy cat but it does not take mistakes into account therefore as copykitten takes mistakes into account it makes it a more dominant player.

THE END