

CO 480 Project Proposal – Spring 2015

Group Membership

Name	ID	email
Brandon Yeh	20453468	byeh@uwaterloo.ca
Xin Ye Lie	204133930	xy5liu@uwaterloo.ca
Michael Ryan Blair	20410326	mrblair@uwaterloo.ca
Mohammed Tahir Zaman	20392866	Mt2zaman@uwaterloo.ca

Project Summary

Person John Forbes Nash Jr.
Place Princeton University circa 1950
Problem Equilibria in Strategic Games
Hook This is the story of a man who achieved equilibrium between players who were not cooperative in games.

Project Outline

Place

1. The end of World War II
2. Communism vs Capitalism
 - (a) Creation of the Eastern Bloc
 - (b) Mutually Assured Destruction - Nuclear Armament
 - (c) Korean War
 - (d) McCarthy & the Red Scare
3. Continued Development of Game Theory and its Applications
4. Beginning of Civil Rights Movements
5. Liberalization of Trade & Rebuilding of Europe

Problem

1. Introduction to Strategic Games
2. Best Response Functions
3. Pure Equilibria & Cournot Oligopoly
4. Mixed Equilibria
5. Existence of Mixed (Nash) Equilibria
 - (a) Sperner's Lemma
 - (b) Browder's Fixed Point Theory
 - (c) Nash's Existence Proof
6. Practical Applications
7. Lemke-Howson Method for Finding Equilibria

Source Material

1. Binmore, K. (2011). Commentary: Nash's work in economics. *Games and Economic Behaviour*, 71(1), 2-5.
2. Cook, M. R. (2009). *Mathematicians: an outer view of the inner world*. Princeton, NJ: Princeton University Press.
3. Hart, S. (2011). *Commentary: Nash equilibrium and dynamics*. *Games and Economic Behaviour*, 71(1), 6-8.
4. McCain, K. W., & McCain, R. A. (2010). Influence & incorporation: John Forbes Nash and the Nash Equilibrium. *Proceedings of the American Society for Information Science and Technology*, 47(1), 1-2.
5. Meltzer, H. (1999). A Beautiful Mind: A Biography. *The Journal of Clinical Psychiatry*, 60(4), 266.
6. Nasar, S. (2001). A Beautiful Mind: *The Life of Mathematical Genius and Nobel Laureate John Nash*. New York: Simon & Schuster.
7. Nash, John F. *Non-cooperative Games*. Thesis. Princeton University, 1950.
8. Nosal, E., & Rupert, P. (2002). A beautiful theory. *Federal Reserve Bank of Cleveland*, 1-4.
9. Saint-Laurent, P. (n.d.). Beautiful minds: The competitive world of financial planning meets the mathematical. *Advisor's Edge*, 5(6), 45.
10. Young, H. P. (2011). Commentary: John Nash and evolutionary game theory. *Games and Economic Behaviour*, 71(1), 12-13.