**CET324 Seminar / Lab Activity**

**THE PRISONERS’ DILEMMA**

There was a famous problem posed in 1950 by John Nash, and for which he won a Nobel prize. It applies to many situations from international trade negotiations to free-riding in peer-to-peer file-sharing systems to cooperation between hunting animals, and Nash first studied it in the context of US and USSR defence spending; his employer, the Rand corporation, was paid to think about possible strategies in nuclear war. However, Nash presented it using the following simple example.

Two prisoners (Alfie and Benjy) are arrested on suspicion of planning a bank robbery. The police interview them separately and tell each of them the following: “If neither of you confesses you’ll each get a year for carrying a concealed firearm without a permit. If one of you confesses, he’ll go free and the other will get 6 years for conspiracy to rob. If both of you confess, you will each get three years”.

What should the prisoners do?

The game can be written out formally, as shown in the figure below

**Benjy**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Confess** | **Deny** |
| **Alfie** | **Confess** | -3, -3 | 0, -6 |
|  | **Deny** | -6, 0 | -1, -1 |

When Alfie looks at this table, he will reason as follows: “If Benjy’s going to confess then I should too as then I get 3 years rather than 6; and if he’s going to deny then I should still confess as that way I walk rather than doing a year’. Benjy will reason similarly.

Questions

1. What do you think the prisoners would do ?
2. Indicate your reasoning / thinking / rationale?

Reflection

1. How can we use this in systems security ?

Programming

1. Can you prepare an algorithm to reflect the decision making process / options ?