



# **BNA 2026**

# **Neumann's Matrix**

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**Brief Study Guide**

# Neumann's Matrix

## Round

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### Speedcoding

In this race of knowledge and agility, participants are tested on their ability to work under pressure and solve problems with the speed of a bullet by completing a series of 12 coding challenges and questions hosted on a DOMJ platform; an automated system designed specifically to judge programming. Time shall be the enemy behind your back, and using any mainstream computing language, you shall speak to it to claim victory in this round. You must heed that coming out victorious in this fast-paced round depends on how much accuracy, speed, efficiency, and a solid understanding of coding concepts you possess.

Prerequisites:

- Participants should have familiarity with at least one mainstream programming language, such as Python, C++, or VB.
- Basic knowledge of data structures and algorithms should be acquired.
- Experience using competitive coding platforms, including LeetCode and Codeforces.

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### Machine Learning

In the second predicament, participants shall rack their brains to use their machine learning knowledge and refine pre-written Jupyter Notebooks to maximize model accuracy using pre-training data analysis and tuning of hyper-parameters to figure out the configurations with minimum loss. Now the question remains; do you possess the element of knowledge to configure said predicament?

Prerequisites:

- Understanding of Python libraries: scikit-learn, pandas, numpy and matplotlib
- Knowledge of basic machine learning algorithms, Linear Regression, Multi-Layer Perceptrons (MLP) etc.
- Understanding of environment and package management,

including Python or conda virtual environments.

- Familiarity with Jupyter Notebooks for coding and analysis.
- Knowing how to work with .csv and .pkl / .joblib

### Cyber Security

To obtain the final script, participants shall participate in a rapid innovation of the classic 'Capture the Flag Challenge' that will test the participants' logic, problem-solving and various cybersecurity skills. Teams have to find and submit hidden flags, securing the post of success into the soil, which depends on smart strategies and quick thinking. This challenge is fierce and competitive, a battle against your opponents, adrenaline posing the question to flight or flee—but would you lose?

Prerequisites:

- Basics of Bash and Linux command line usage.
- Knowledge of steganography techniques and relevant software, for example the Exif Tool.
- Understanding of basic network scanning and web exploitation techniques, including SQL injection, ARP poisoning, and reverse shell access.
- Brute force cracking of both simple ciphers and hashes (MD5 & SHA256)
- Interpreting HTML and using the browser inspect tool.

**Note: The information in this document is subject to changes.**