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Netica - Bayesian Network

Domain: Recruitment automation system
Netica version: 5.24

Domain + use-case description:

- Recruitments are an integral part of any industry.
- However, the factors involved in evaluating a candidate against an available position are numerous and consequently consumes a lot of time.
- This project aims to construct a Bayesian network to aid the process of decision making.
- The network is divided into four main parts:
    - Candidate's attributes: This subset contains the attributes pertaining to the candidate, namely,
        - Age of the person when they initially encountered programming
        - Avenues of learning
        - Primary framework knowledge
        - Primary programming language
        - Prior work experience (Yes/No)
        - Work experience (in years)
        - Education
        - Require sponsorship for employment
        - Willingness to relocate
    - Industry's attributes: This subset contains the attributes pertaining to the industry/company, namely,
        - Technology demands
        - Programming language requirement
        - Framework requirement
        - Experience (in years) required
    - Screening/decision nodes: This subset of nodes forms the inner layers of decisions based on a combination of other attribute nodes. They are utilized to form other decision nodes and/or the final result nodes.
        - Technology level (applicant)
        - Technology level required (industry)
        - Initial screening
        - Experience screening
        - Education screening
        - Geographical screening
        - Secondary screening
        - Final screening
    - Result nodes: The final results derived from the network.
        - Invitation for programming evaluation
        - Invitation to interview

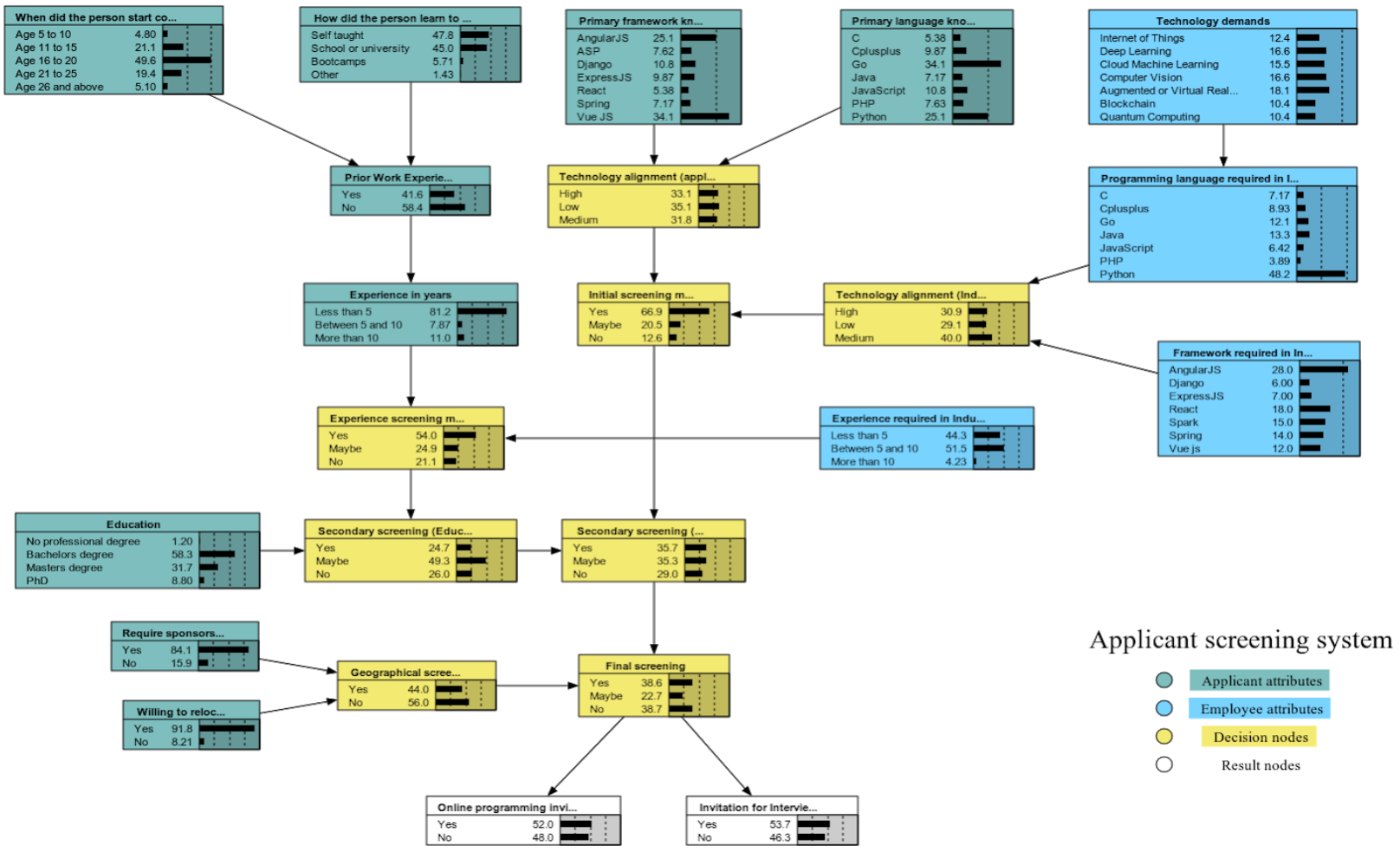
- All the probabilities in the attribute nodes are constructed based on statistics from a survey obtained here: https://research.hackerrank.com/developer-skills/2019 and the conditional probabilities were constructed manually.

Note: There are 23 nodes in total in the Bayesian network.

Steps to utilize the tool:

- Extract the contents of the zip file.
- Load the 'recruitmentAutomation.neta' onto the Netica application.
- Enter the findings for the different nodes in order to calculate the probability of a candidate's chances in the specified domain.
- Alternatively, enter the findings in the decision/result nodes to track the probability of the various attributes required in candidates and the industry.

Original network:



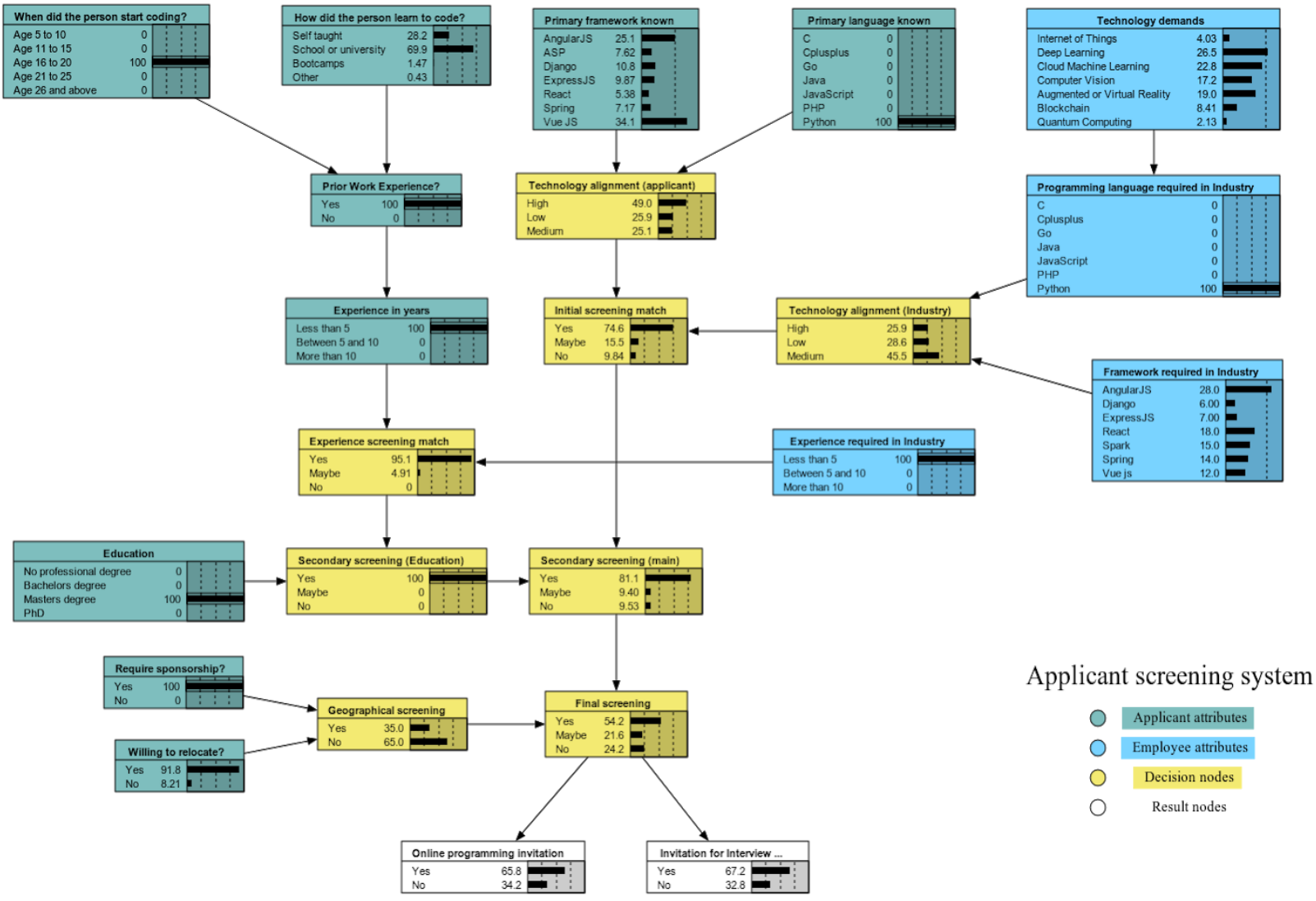
Sample input/output:

Case 1:

Candidate: Started coding between ages 16 and 20, prior work experience less than 5 years, utilizes Python, has a Master's degree and requires sponsorship.

Company: Python requirement, experience required is less than 5 years and overrides secondary screening to a positive result.

Final result: The probability of the candidate invited to the online programming screening increases to 65.8% and the probability associated with the candidate being invited to the interview increases to 67.2%



Case 2:

Candidate: Knows Java and Vue JS, has prior work experience less than 5 years, has completed a Bachelor's degree and is willing to relocate.

Company: Needs experience between 5 and 10 years.

Final result: The probability decreases for the programming screening invitation to 49.5% and similarly for the interview invitation to 51.2%