Domain:

The domain I choose is an Automated system that helps students choose the right college major.

Choosing a major field of study can be a difficult decision. In fact, over half of college graduates would change their major if they could go back to school.
Students typically choose their major based on economic factors. However, it's important to also explore majors that reflect personal values and traits. So I would like to build a convenient and automatic system that helps students choose the right college major.

Bayesian networks are ideal for taking a fact that occurred and predicting the likelihood that any one of several possible known causes was the contributing factor. Bayes nets are easily extended to computing utility, given the degree of knowledge we have on a situation, we can use the utility function to evaluate the "goodness" of a decision.

In our case, the Bayesian networks give scores of choosing a college major. Higher scores indicates better choices.

Task:

1. Read info like course works, abilities and preferences etc provided by the user
2. Calculate the probability for each major.
3. Give scores for each major based on given preferences. The highest score indicates the best choice of majors.

Inputs:

Abilities:

Logics: Ability to reason logically. ("Great" means good at it, and "Bad" means not good at it.)

Verbal: Ability to express in words.

Teamwork: Ability to achieve a common goal or to complete a task in the most effective and efficient way with others.

Leadership: Ability to motivate a group of people to act toward achieving a common goal.

Creativity: Ability to perform acts of turning new and imaginative ideas into reality.

Aesthetics: Ability to appreciate the arts aesthetics.

SpacialAbility: Ability to understand and remember the spatial relations among objects.

MemoryAttributes: Measure one's integrated ability to remember things. (No obvious ability that leads to this Node, so I make it a direct input.)

Courses:

CoursePhys: Physics course, such as general physics, thermodynamics etc.. ("Great" means good at it, and "Bad" means not good at it.)

CourseMath: Math courses, such as linear algebra, calculus etc..

CourseCS: Math courses, such as data science, AI etc..

CourseChem: Chemistry courses, such as general chemistry, organic chemistry etc..

CourseBio: Chemistry courses, such as biology, biochemistry etc..

CourseArt: Chemistry courses, such as modern art, classic music etc..

Preferences:

Preferences: Adjust the number left to a major to set the preferences. Higher number means higher preference for that major. The sum of all numbers is one.

ExpectedIncome: "High" is for high future income expectation and vice versa.

Non-Inputs:

Attributes:

MemoryAttributes: Measure one's integrated ability to remember things. (No obvious ability that leads to this Node, so I make it a direct input.)

ThinkingReasoningAttributes: Measure one's integrated ability to think and reason.

SocialAttributes: Measure one's integrated ability to work with people.

ArtAttributes: Measure one's integrated ability to make art.

Probabilities:

Physics, Math, ComputerScience, Medical, Dental, Business, Art: "Yes" shows the percentage of students suits the input situation are in this major.

Scores:

DecideMajor: This node gives a score for each major. The major gets the highest score is the best choice for the student, and "0" means not a good choice. The sum of all scores is normalized to 1.

Utilities: The node named U is the utility node that calculates the scores.

Example:
The default numbers show how it works for a normal engineering student who is good at physics, math but hasn't chosen a major and wants to be a dentist in the future.

Update Log:

*Removed PrefMath, PrefPhysics etc. nodes. Now a new node called Preference is added and it plays the same rules as all the old nodes. By doing this, the size of the table of the utility node is greatly reduced.

*Relinked all natural nodes and add some heuristic guess numbers to the table of those nodes to make it describe the causality of nodes better.

*Rewrite utility node.

*Made all links more organized.

Usage:
1. Unzip, open MajorFinder_v2.neta in Netica
2. Compile Net (Lighting icon) if it's not already compiled.
3. Have fun!!