



HUNGARIAN INVENTORS, INVENTIONS, TASKS

LÁSZLÓ BÍRÓ – BALLPOINT PEN

László Bíró designed the first ballpoint pen in Budapest in the 1930s (registration 1938-Hungary). Others had tried to create the ballpoint pen before him, but he is mostly responsible for the spread of today's modern device. He designed a small ball into the pen; when the pen moves on the paper, on the writing surface, the ball rotates, thus picking up the ink, which is then applied to the paper.

The first ballpoint pens produced for regular sale were sold in Argentina from 1945 under the name "Eterpen".

László Bíró also had many other significant inventions, including heat-resistant tiles, a device for measuring blood pressure, a new type of lock, and an electromagnetic transmission device.

László Bíró was highly recognized in Argentina. His birthday, September 29, was declared Argentine Inventors' Day.

DENNIS GABOR – HOLOGRAPHY

Holography was invented by the Hungarian physicist Gábor Dénes, a British citizen, in 1947. He discovered a way of recording images that allowed the reproduction of more information than any other method known up to that time. Since it was possible to store – seemingly – all information, Gábor Dénes named this method holography, from two Greek words meaning “whole”, “complete” and “writing”, “document”. He received the Nobel Prize in Physics in 1971 for the development of holography.

The most common application of holograms, security identification marks, can be found on cassettes and CDs, paper money, and bank cards. These tiny holograms are almost unforgeable because a perfect copy can only be made using the original hologram.

KARL GOLDMARK – COLOR TELEVISION

Károly Goldmark perfected his color television process after World War II. The human eye has two types of photoreceptors: one that allows for black-and-white vision, and the other that allows for color vision. Of the latter, however, there are only three types: those sensitive to blue, green, and red light. The essence of the Goldmark color television system is a rotating disc, which, when moved, alternately places blue, green, and red color filters in front of the picture tube of the recorder. The same system is also found in front of the picture tube of the receiving device, its color disc rotating in synchrony with that of the transmitter.

Goldmark also created a miniature TV for examining the gastrointestinal tract and he was instrumental in broadcasting the first moon landing. In total, CBS patented more than a hundred of his inventions.

TELKES MÁRIA – TENGERVÍZ-SÓTALANÍTÓ NEPENERGIÁVAL, NAPHÁZ, NAPENERGIÁVAL MŰKÖDŐ SÜTŐ

Mária Telkes's patent for a solar-powered seawater desalination plant made the desalination process significantly simpler and more accessible. She developed a lightweight, portable distiller capable of distilling about one liter of seawater per day, using plastic film and sunlight.

She created the heating system for the Dover Sun House near Boston in 1948. The passive house, built as part of a long-term experimental project, was the world's first experimental residential building heated exclusively by solar energy, the so-called Sun House.

In 1959, he designed a solar-powered oven for daily use, primarily for poorer countries, which became especially popular in India. There, the high number of hours of sunshine, the item simple principle it's based on, the child-safe operation and the affordable price of the device allowed housewives to properly cook food thoroughly at up to 220 degrees, thus avoiding diseases resulting from insufficient cooking.

ENDRE MESTER – LOW LEVEL LASER

Mester started his laser research in 1965. In 1974 he founded the Laser Research Center at Semmelweis, and continued working there for the remainder of his life. He is credited with the discovery of low level laser therapy. Mester's research has shown that low level lasers can have a biostimulating effect at the cellular level, which promotes tissue regeneration and reduces inflammation.

LEO SZILARD – CYCLOTRON PARTICLE ACCELERATER, ELECTRON MICROSCOPE

Between 1925 and 1933, he filed over thirty patents, eight of them jointly with Albert Einstein. In 1929, he patented the cyclotron particle accelerator and, together with Einstein, patented a new type of electrodynamic pump refrigerator.

The Szilárd–Chalmers effect is a physicochemical process that allows the separation of radioactive isotopes from their stable isotopes. Historically, the first chemical hot-atom reaction is the so-called Szilard–Chalmers reaction. Szilard and Chalmers irradiated ethyl iodide with thermal neutrons. The main question was whether the recoil of a gamma photon emitted during the reaction could lead to chemical bond breakage. It turned out that it was, because the resulting radioactive ^{128}I isotope (negative beta emitter) could be shaken into the aqueous phase from the water-insoluble ethyl iodide.

JOHN VON NEUMANN – VON NEUMANN ARCHITECTURE

Von Neumann architecture

John von Neumann can be considered as the father of traditional computers, as he, among many other scientific activities, also provided the basic principles of how classical computers work.

These principles, according to which most computers are built, are as follows:

- The principle of the stored program:

The instructions that make up a program can be expressed as numbers, that is, they can be treated as data. They can be stored in the internal memory like any other data.

This allows the computer to operate independently, as it retrieves both data and instructions from memory.

The memory stores the program along with the numerical data, and the control unit executes the sequence of instructions.

- Use of binary number system and the computer should be completely electronic.

The binary number system and the arithmetic and logical operations interpreted on it are easy to implement with two-state circuits (e.g.: 1 - higher voltage, 0 - lower voltage)A számítógép legyen soros működésű:

The machine executes each instruction one after the other.

- The computer must have internal memory.

Due to the fast operation of the computer, there is no possibility for the operator to intervene in the calculation process after each step. The internal memory can store data and partial results of individual calculations, so the machine can perform certain sequences of operations automatically.

- The computer should be universal.

It is not necessary to build special equipment to perform the various tasks of a computer. Turing proved that a machine that can perform a few basic operations is, in principle, capable of performing any calculation (Turing machine).

JÁNOS IRINYI – SAFETY MATCH

János Irinyi, one of the most talented chemists of the Hungarian Reform Era. Inventor of the safety match. He mixed the white phosphorus in the head of a match with lead oxide, thus inventing the match still in use today. Matchsticks are most often made from white pine or poplar wood. You can make matchstick figures and models from it, and play puzzles and math games with it. He was commissioned by Lajos Kossuth, and as a major,

he was the head of the Oradea gunpowder factory. After the defeat of the War of Independence, he was sentenced to prison. After his release, he retired from political life and devoted himself to his scientific work.

JENŐ DULOVITS – DUFLEX

Mathematician, photographer, among others, inventor of the Duflex, the world's first 35mm single-lens reflex camera. He is one of the most prominent figures in the history of photography and photographic technology, even in a global context.

ANTAL BEJ CZY – SOJOURNER ROVER

Antal Bejczy was involved in the Mars Landing program in 1969. In the early 1980s, he initiated the robot intelligence program based on perception, in which not only "vision" but also proximity, torque, and touch sensing were built into the robot - this later led to the successful robotic arm that could sense pressure and torque. In 1997, there was enormous interest in the successful operation of the Mars Rover designed by Antal Bejczy. Bejczy developed the remote control technology for the research vehicle, named Sojourner. The rover landed on the surface of the red planet on July 4, 1997, with the Pathfinder spacecraft, from where it sent data back to Earth for several weeks.

PÉTER VÁRKONYI AND GÁBOR DOMOKOS- GÖMBÖC

The Gömböc is the first known homogeneous body to have one stable and one unstable equilibrium point, i.e. a total of two equilibrium points. It can be proven that no body with fewer equilibrium positions can exist.

No matter how you put the Gömböc down, it always returns to its stable equilibrium point (S). The Gömböc is made of only one, homogeneous material, so the shape itself ensures its recovery.

The creation of the convex body named Gömböc proved the 1995 hypothesis of the Russian mathematician Vladimir Igorevich Arnold, according to which there exists a homogeneous, convex body with fewer than four equilibrium points.

Gömböc also inspired further inventions in medical research, such as the oral insulin capsule, which was developed by researchers at MIT and Harvard University primarily for people with type 2 diabetes.

The invention of the two Hungarian scientists was linked to the mRNA vaccine against the coronavirus by two researchers from the American MIT, gastroenterologist Giovanni Traverso and chemical engineering professor Robert Langer. Gömböc's theory was used to develop an oral capsule that would allow mRNA vaccination.

RUDOLF E. KÁLMÁN – KALMAN-FILTER

The Kalman filter is an algorithm developed by Rudolf E. Kálmán for estimating the state of dynamic (changing) systems through measurements, or in other words, the classical Kalman filter is the optimal state estimator of linear time-invariant systems loaded with normal noise.

The algorithm is based on the fact that, with the help of prior knowledge about the operation of the system, we can infer the next state from a previous state based on the dynamics of the system, and then by comparing this with the measurement result taken at the next moment, we obtain a more accurate estimate of the state.

Kalman filtering has many technological applications. A common application is the guidance, navigation, and control of vehicles, especially aircraft, spacecraft, and dynamically positioned ships. Furthermore, Kalman filtering is widely used in time series analysis tasks, such as signal processing and econometrics. Kalman filtering is also important in the motion planning and control of robots, and can be used to optimize the trajectory. Kalman filtering is also suitable for modeling the motion control of the central nervous system. Due to the time lag between issuing motor commands and receiving sensory feedback, the use of Kalman filters provides a realistic model for estimating the current state of the motor system and issuing updated commands.

FELADATOK

I'M A FAMOUS PERSON, BUT WHO AM I?

It is worth playing in smaller groups, with a maximum of 10 people. Required materials: as many pieces of paper as there are participants, glue. Each participant should receive a piece of paper and write on it the name of an inventor they have learned about together. The group leader collects the cards, mixing them up and then distributes them again, they cannot look at the received cards, so that no one knows what name is on their card. The participant selected by one of the group leaders will have stick the received paper on his/her forehead with the help of the group leader/assistant, in a way that the person on whose forehead it is stuck cannot see it. The participant with the inscription taped to his/her forehead must ask questions to the others who see the name on the sheet. Those who see the sheet can only answer yes or no. The player must guess whose name is on the card using riddle questions. The player must formulate the questions as if they were the person on the paper. For example: Am I a man? What did I invent?

After the player has decoded the answer, another participant takes the next turn, until everyone has had a turn. (If someone is having a hard time, the group leader should direct the questions/other assistance.) If the game is scored, then for each helping question/other helping information, the student receiving help should lose at least 60% of the points compared to the participants who guessed independently.

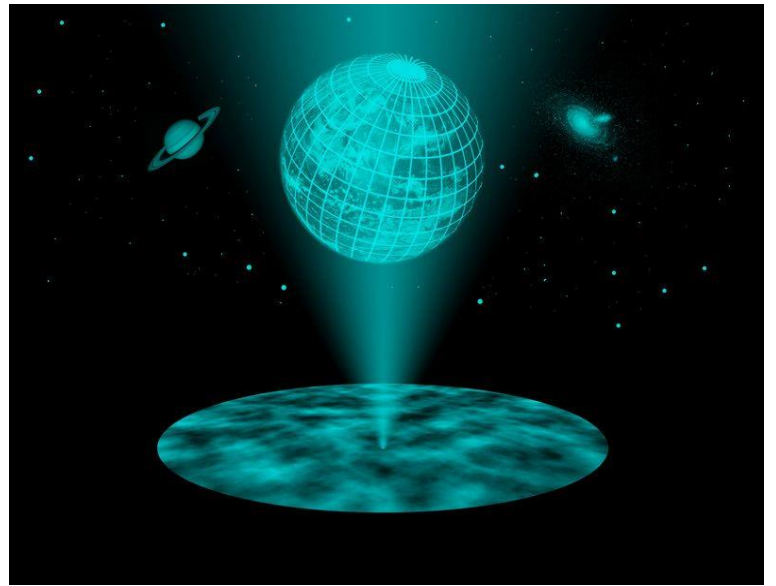
The scoring should match the use and be compared to other scoring tasks in the use case. This is particularly important if you want to add the points earned with the task to a cumulative scoring competition. A player who successfully guesses independently can receive 1 / 2 / 3 / x points, regardless of the questions they ask themselves. In this case, the available points can only change for the help of the group leader. A maximum of 40% of the points awarded for an independent successful guess can be awarded for a successful guess with help. Also, the maximum points available may depend on the number of questions asked by the player, for example, for a successful guess after one question: 10 points, after two questions: 9 points are awarded, and so on, with each additional question earning the successful guesser one point less.

WHAT AM I?

It is worth playing in smaller groups, with a maximum of 10 people. Required tools: as many printed pictures of the inventions and discoveries learned as there are participants (one picture can be used more than once), glue. The group leader distributes the cards, mixing them up, so that no one knows what is on their card, and the participants cannot see what is on the card they have been given. The participant selected by one of the group leaders will have stick the received paper on his/her forehead with the help of the group leader/assistant, in a way that the person on whose forehead it is stuck cannot see it. After that, the person who had the sheet stuck to their forehead has to ask the others questions. Those who see the sheet can only answer yes or no. The player must guess whose name is on the card using riddle questions. The player must formulate the questions as if he or she were the invention, the concept in the picture. For example: can I be made of metal? Can I only be made of metal?

After the player has decoded the answer, another participant takes the next turn, until everyone has had a turn. (If someone is having a hard time, the group leader should direct the questions/other assistance.) If the game is scored, then for each helping question/other helping information, the student receiving help should lose at least 60% of the points compared to the participants who guessed independently.

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A Neumann-elvű gépek

A Neumann elvek:

- A számítógép legyen teljesen elektronikus
- Kettes számrendszert használjon
- Adatok és programok egy belső tárban, a memóriában legyenek
- A számítógép legyen univerzális Turing-féle gép (kövesse ezt a matematikai modellt)

