PROBLEM SOLVING

DAY 1
THE SCENARIO

ONE SUMMER SOLSTICE, WHILE SEARCHING FOR THE SOUTHERN SHORTCUT, SILAS SEEKER, THAT SUPERMAN OF SEAFARERS, WAS SHIPWRECKED DURING A SUDDEN SEVERE SQUALL. AUSPICIOUSLY, SILAS SIGHTED A SMALL SANDY ISLE IN THE DISTANCE AND SUCCEEDED IN SWIMMING ASHORE. EXHAUSTED, HE SLIPPED INTO A SOUND SLEEP. WHILE HE SLEPT, SILAS DREAMT THAT HE WAS DISCOVERED BY TWO TROLLS, BOTH OF WHOM, FORTUNATELY, WERE ABLE TO CONVERSE IN ENGLISH. THE TWO WERE IDENTICAL IN ALL ASPECTS OF THEIR APPEARANCE; HOWEVER, ONE BELONGED TO A CLAN WHOSE MEMBERS ALWAYS TELL THE TRUTH, THE OTHER TO A CLAN WHOSE MEMBERS ALWAYS LIE.

• “I AM GLOG AND HE IS GLUM,” RESPONDED THE FIRST. “NO, I AM GLOG AND HE IS GLUM,” ANSWERED THE SECOND.

• JUST THEN A THIRD TROLL APPEARED. HOPING TO SHED SOME LIGHT ON THE MATTER, SILAS POINTED TO THE TWO AND ASKED, “WHICH OF THEM CAN I BELIEVE?” “HE AND I BELONG TO THE SAME CLAN,” REPLIED THE THIRD TROLL, POINTING TO THE FIRST. “THAT’S TRUE; THEY DO BELONG TO THE SAME CLAN,” SAID THE SECOND TROLL. ASSUMING THAT SILAS’ DREAM WAS ACCURATE, WHO IS TELLING THE TRUTH AND WHAT WAS THE NAME OF THE ISLAND?
THE SOLUTION

TROLL 1
THE ISLE OF HAMLOCK
I AM GLOG AND HE IS GLUM

TROLL 2
THE ISLE OF GRINDLE
I AM GLOG AND HE IS GLUM
TROLL 1 AND TROLL 3 BELONG TO THE SAME TRIBE

TROLL 3
TROLL 1 AND TROLL 3 BELONG TO THE SAME TRIBE

If Troll 3 is a Truthteller, then Troll 2 is a Truthteller implying Troll 1 is a Liar

But, if Troll 1 is a Liar then Troll 3 is a Liar, which is a contradiction

Therefore, Troll 1 is the Truthteller and the Island is Hamlock.
Silas lived on the island for six years, but during all that time he never learned how to visually tell the difference between members of the two clans. One day Silas met two trolls. The first claimed that they belonged to different clans, whereas the second proclaimed that the first was a liar.

To which clan did each of the two belong?
THE SOLUTION

TROLL 1
THEY BELONG TO DIFFERENT CLANS

TROLL 2
TROLL 1 IS A LIAR

If Troll 1 is a Liar, then they belong to the same clan

But, if Troll 1 is a Liar then Troll 2 is also Liar, which is a contradiction

Therefore, Troll 1 is a Truthsetter and Troll 2 is a Liar.
During his sojourn on the island, Silas gave names to the two clans. The truthtellers he called Truthfuls and the liars he called Liars. One day, Silas met three trolls. He inquired to which clans they belonged. “All of us are Liars,” said the first. “No, only two of us are Liars,” amended the second. “That’s not true either,” corrected the third. “Only one of us is a Liar.”

To which clan does each of the three belong?
THE SOLUTION

TROLL 1
ALL OF US ARE LIARS

TROLL 2
NO, ONLY TWO OF US ARE LIARS

TROLL 3
ONLY ONE OF US IS A LIAR

If All of them are liars, then troll 1 is a truth teller which is a contradiction

That means that either troll 2 or troll 3 must also be lying because they cannot both be telling the truth.

Therefore, Troll 1 and Troll 3 are Liars and Troll 2 is a truth teller.
Shortly after Silas completed building a raft to take him off the island, five trolls arrived with food and water for his voyage. As usual, Silas inquired about their clans. “Three of us are Truthfuls,” said the first. “That’s right, three of us are Truthfuls,” the second agreed. “No, only two of us are Truthfuls,” said the third. “The first three are all lying,” said the fourth. The answer of the fifth man left no doubt in Silas’ mind as to the clan affiliation of each troll.

• To which clan did they each belong?
THE SOLUTION

• TROLL 1 – THREE TRUTHFULS
• TROLL 2 – AGREES WITH THE FIRST
• TROLL 3 – TWO TRUTHFULS
• TROLL 4 – THE FIRST 3 ARE LIARS

Troll 4 is the only Truthful. The rest are liars
When Heidi first arrived on the island, she encountered a group of three trolls. One was very tall, one was very short, and the third was of medium height. Heidi introduced herself. “Welcome,” said the shortest of the three. “I am Gladden. He (indicating the tallest of the three) is Lowax. And he (indicating the remaining troll) is Grout.” “He is, as he says, Gladden. But I am Kaut,” corrected the troll of medium height. “And the tall troll is Tildeau.” The tall troll objected: “I am Lowax. But the short one is Waldar. And he (pointing to the troll of medium height) is Gaut.”

If at least one of them was a Truthful, what were the names of the three trolls?
THE SOLUTION

SHORT TROLL
I AM GLADDEN. HE (INDICATING THE TALLEST OF THE THREE) IS LOWAX. AND HE (INDICATING THE REMAINING TROLL) IS GROUT

MEDIUM TROLL
HE IS, AS HE SAYS, GLADDEN. BUT I AM KAUT,” AND THE TALL TROLL IS TILDEAU

TALL TROLL
I AM LOWAX. BUT THE SHORT ONE IS WALDAR. AND HE (POINTING TO THE TROLL OF MEDIUM HEIGHT) IS GAUT.

Tall Troll (Lowax) is a Truthful, Short Troll (Walder) is an Alternator (lying first), and Medium Troll (Gaut) is a Liar.
• Later that day, Heidi met another group of three trolls—one from each clan. Heidi asked to which clans they belonged. The Spokestroll of the group replied: “I am a liar; the lady is a truthful; the young gentletroll is a mixed breed.” To which clans did each belong?
SPOKESTROLL
I AM A LIAR
THE LADY IS A TRUTHFUL
THE YOUNG GENTLETROLL IS A MIXED BREED

LADY TROLL
SAYS NOTHING

GENTLE TROLL
SAYS NOTHING

The spokestroll is an Alternator, the lady is a Truthful, and the gentletroll is a Liar.
AFTER HEIDI HAD BEEN ON THE ISLAND FOR A FEW DAYS, SHE REALIZED THAT EACH INDIVIDUAL’S NAME WAS WOVEN INTO HIS OR HER CLOTHING AND EASY TO SEE. WHEN HEIDI WAS INTRODUCED TO WINKEN, BLINKEN, AND FINKEN, SHE ASKED HER USUAL QUESTION. THE REPLIES SHE RECEIVED WERE: WINKEN: I AM AN ALTERNATOR. BLINKEN: WINKEN IS A LIAR. FINKEN: WINKEN IS A TRUTHFUL.

IF NO TWO OF THE THREE BELONGED TO THE SAME CLAN, TO WHICH DID EACH BELONG?
THE SOLUTION

WINKEN
I AM AN ALTERNATOR

BLINKEN
WINKEN IS A LIAR

FINKEN
WINKEN IS A TRUTHFUL

Winken is a Liar; Blinken is a Truthful; and Finken is an Alternator who is lying.
When Heidi asked her usual question to Hocus, Pocus, Crocus, and Cloy, only Hocus and Pocus replied. “I am a Truthful; Pocus is a Liar; Crocus is a Liar; Cloy is a Truthful,” was Hocus’ response. “No, Hocus is a Liar; I am a Truthful; Crocus is an Alternator; Cloy is a Truthful,” corrected Pocus.

To which clan did Hocus, Pocus, and Crocus belong?
THE SOLUTION

HOCUS
I AM A TRUTHFUL; POCUS IS A LIAR; CROCUS IS A LIAR; CLOY IS A TRUTHFUL

POCUS
NO, HOCUS IS A LIAR; I AM A TRUTHFUL; CROCUS IS AN ALTERNATOR; CLOY IS A TRUTHFUL

CROCUS
NO RESPONSE

Hocus is a Liar, Pocus is an Alternator, and Crocus is a Truthful.
Each year, the leaders of the three clans participate in an athletic competition to determine which of the three should govern the island for the new year. After this year’s competition, the following statements were made by the competitors:

Ange: I came in second; Benge came in last.
Benge: Ange came in last; Conge won.
Conge: I came in last; Ange won.

What was the order of finish in the competition?
THE SOLUTION

ANGE
I CAME IN SECOND
BENG CAME IN LAST

BENG
ANGE CAME IN LAST
CONGE WION

CONGE
I CAME IN LAST
ANGE WION

Conge, Ange, Benge