

# KNOWLEDGE FOUNDATION

KNOWLEDGE



FOUNDATION

Knowledge Foundation : <https://KnowledgeFound.org> | Knowledge Token® : <https://KnowledgeFound.org/token>

## COLLABORATORS

- Immersive Education Initiative (USA)
- Lucerne University of Applied Sciences and Arts (Switzerland)
- Massachusetts Institute of Technology (MIT) Bitcoin Club (USA)
- University of Oxford Blockchain Research Centre (UK)
- University of Zurich Blockchain Center (Switzerland)
- Yale University Blockchain Club (USA)
- Brown University Blockchain Club (USA)
- DFINITY Foundation (Switzerland)
- University of Stellenbosch (South Africa)
- Pretoria University (South Africa)

## INTERNATIONAL PARTNERS

- United Nations Global Resource for Anti-Corruption Education and Youth Empowerment (GRACE) initiative
- United Nations Office on Drugs and Crime (UNODC)

# 2024 VIRTUAL

## Coding4Integrity HACKATHON



October 25th to November 3rd

Join us virtually (online) at any time during the virtual hackathon period from October 25th to November 3rd to compete in our virtual hackathon for prizes and prestige!

Code for **as long or as little** as you would like during this time frame. How much (or how little) time you code is up to you!

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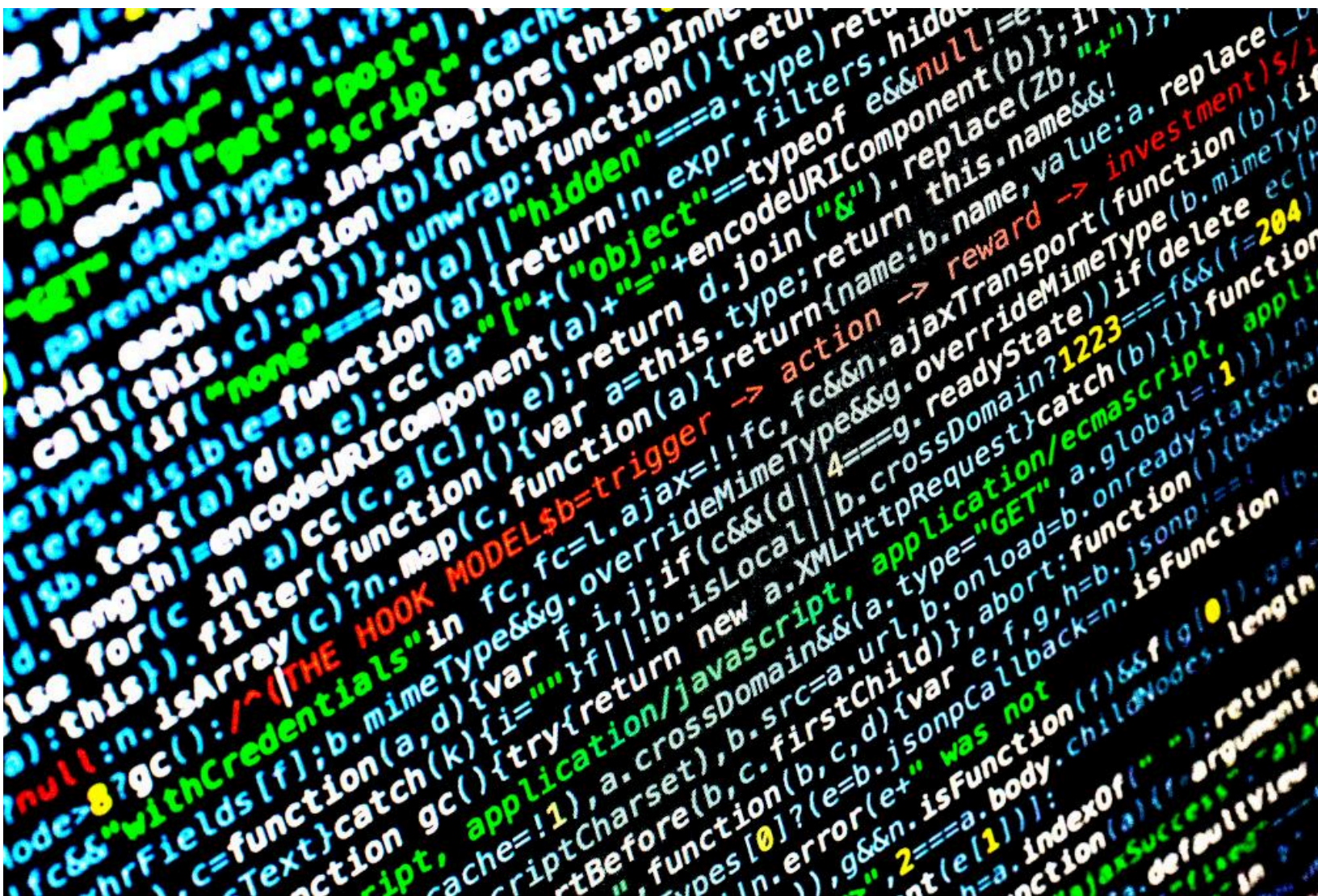
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## UNITED NATIONS Coding4Integrity HACKATHON SERIES

This hackathon is part of the new 3-year series of United Nations Office on Drugs and Crime (UNODC) Coding4Integrity hackathons made possible through the partnership of [UNODC](#), the UNODC Global Resource for Anti-Corruption Education and Youth Empowerment ([GRACE](#)) Initiative, [Knowledge Foundation](#) and [DFINITY Foundation](#).



# 1. AWARDS / PRIZES



Participate at any time during the virtual hackathon period from October 25th to November 3rd to compete for prizes and prestige. Code for as **long** or as **little** as you would like during this time period: **it's up to you!**

Developer grant prizes are awarded by the [DFINITY Foundation](#) in collaboration with the [Knowledge Foundation](#). The grants are used to fund participation (after the hackathon) in developing [Knowledge Token](#)<sup>®</sup> on the Internet Computer platform and will be distributed after the hackathon has ended.

[Knowledge Token](#)<sup>®</sup> prizes are redeemable for registration fees at all future [Summits and Symposia](#) worldwide.

*Award (prize) details in on the [Hackathon area of the official event website](#)*

# 2. REQUIREMENTS

## 2.1 OPEN SOURCE

All submissions (entries) for this hackathon will be made available to the public in a free and open manner, and are therefore automatically considered [Open Source](#) upon submission. Only [Open Source](#) submissions will be considered.

## 2.2 SUBMITTING YOUR SOLUTION (ENTRY)

At the conclusion of the hackathon you will submit your solution (hackathon entry) using an online form, at which time you will be required to provide:

1. A link to your source code. For this you can use a public GitHub repository, a public website folder, or any other public online code repository.
2. A link to your solution running on the Internet Computer main network ("mainnet"). In order to do this you must [deploy your solution to an Internet Computer canister on the mainnet](#) and "fuel" your canister using "cycles" (see "**FREE CYCLES**" below).
3. A link to your design documents, if you created such materials. Note that design documents are not required, but are recommended.
4. The name and email address of each member of your team (or yourself, if you are competing Solo as an individual and not on a team).

*See SUBMITTING YOUR SOLUTION below for more details.*

## 2.3 BLOCKCHAIN PLATFORM

Only hackathon entries (submissions) created/programmed using the open source Internet Computer will be considered.

Internet Computer is a relatively new blockchain platform for which you will find the following resources important to become familiar with this platform in time to compete:

1. INTERNET COMPUTER: <https://internetcomputer.org>
3. IC DASHBOARD: <https://dashboard.internetcomputer.org>

*See DEVELOPER RESOURCES below for Internet Computer developer documentation, videos and support resources.*

## 2.4 PROGRAMMING LANGUAGES

Although **Motoko** is preferred, your hackathon entry (submission) may be programmed in any language supported by the Internet Computer.

*Note that Motoko is preferred but not required (see JUDGING PREFERENCES).*

## 2.5 ANONYMOUS SUBMISSIONS: NO NAMES OR BRANDING

Note that judging is conducted in a manner intended to be unbiased and fair. To this end "blind judging" is the process by which hackathon solutions (entries) are reviewed and judged, meaning the judges do not know whose work they are judging, they don't know who the other judges are, and they don't share or publish their scores. **To ensure anonymity, be very careful to remove your names, your organization (school, company, etc.) names and logos, and any other identifying information from your solution front-end (user interface).**



## 2.5 FREE CYCLES

At the conclusion of the hackathon you will submit a link to your program running on the Internet Computer main network (mainnet). To do this you must [deploy your solution to the Internet Computer mainnet](#) and fuel your canister with cycles.

You can obtain free cycles via the **Cycles Faucet** detailed in the official Internet Computer developer documentation below:

- **Developer Documentation:**  
<https://internetcomputer.org/docs/current/developer-docs> (see "Acquiring and using cycles" and "Mainnet Deployment")
- **Video:** <https://www.youtube.com/watch?v=eynEk3Bz7QY&t=902s>
- **Developer Journey:**  
<https://internetcomputer.org/docs/current/tutorials/developer-journey>
- **Developer Journey Discussion forum:**  
<https://forum.dfinity.org/t/developer-journey-feedback-and-discussion/23893>

*Be careful to **submit your cycle requests as early as possible** so that you have them in time to compete.*

*We receive a high volume of cycle requests at the end of every hackathon (when your solutions are deployed on the Internet Computer mainnet and therefore require cycles).*

*Typically you will receive cycles from the **Cycles Faucet** within 1 to 2 days, but with the increased volume of requests at the end of each hackathon there is a chance that you **may not receive the cycles in time.***

Don't wait: Request your cycles **NOW!**

## 2.6 DEVELOPER RESOURCES

HACKATHON CHEATSHEET: [ICP Hackathon CheatSheet](#)

DEVELOPER DOCUMENTATION:

- **Internet Computer Developer Documentation**  
<https://internetcomputer.org/docs/current/developer-docs>

DEVELOPER DISCUSSION FORUM AND DISCORD:

- **Internet Computer Developer Discussion Forum**  
<https://forum.dfinity.org>
- **Internet Computer Developer Discord**  
<https://discord.com/invite/jnjVVQaE2C>

*The official DFINITY Developer Office Hour (on Discord) is especially helpful as you can receive live (realtime) advice from professional Internet Computer developers:*

**DFINITY Developer Office Hour : [Every Wednesday](#) (2 sessions)**

Session 1: 09:00 CET

Session 2: 10:30 PDT

DEVELOPER JOURNEY:

- **Developer Journey**  
<https://internetcomputer.org/docs/current/tutorials/developer-journey>
- **Developer Journey Video Tutorial Series (YouTube videos)**  
<https://www.youtube.com/watch?v=oBUpJ4CqmN0&list=PLuhDt1vhGcrdR2h6nPNylXKS4u8L-efvD>
- **Developer Journey Discussion Forum**  
<https://forum.dfinity.org/t/developer-journey-feedback-and-discussion/23893>



# 3. JUDGING PREFERENCES

## Judging Preferences

The following recommendations are not requirements, but are important "judging preferences" that are applied during the judging phase of the hackathon.

Solutions (entries) that are otherwise equivalent will be awarded higher scores when the following preferences are followed:

- **MOTOKO Preference:** Preference is given to solutions that code back-end functionality in Motoko, the open-source programming language created specifically for the Internet Computer.
- **SVELTE Preference:** Preference is given to solutions that code front-end functionality using Svelte, the open-source front-end component framework.
- **SINGLE-PAGE or MINIMAL-PAGE Preference:** Preference is given to single-page solutions where all user interactions occur on the same web page (as opposed to interfaces that use multiple web pages), or using a minimal number of web pages when single-page solutions are not possible or not ideal.
- **MOBILE-FIRST Preference:** Preference is given to "mobile-first" solutions. Mobile devices (phones, tablets, etc.) are the primary target, although your solution's user interface should still be functional using desktop/laptop computers.
- **DESIGN DOCUMENTS Preference:** Preference is given to solutions that are accompanied with corresponding design documents (architecture designs, data designs, flow diagrams, user interface mock-ups, interaction diagrams, etc.)
- **TESTING Preference:** Preference is given to solutions that implement unit, integration and end-to-end testing (if applicable). For details see the ICP Developer Journey 2.5 [video](#) and [documentation](#).

# 4. HACKATHON TRACKS: AI & NFTs

This hackathon is organized into two distinct tracks. You can compete in either one, or both, of the following tracks:

**Track 1:** Artificial Intelligence (AI)

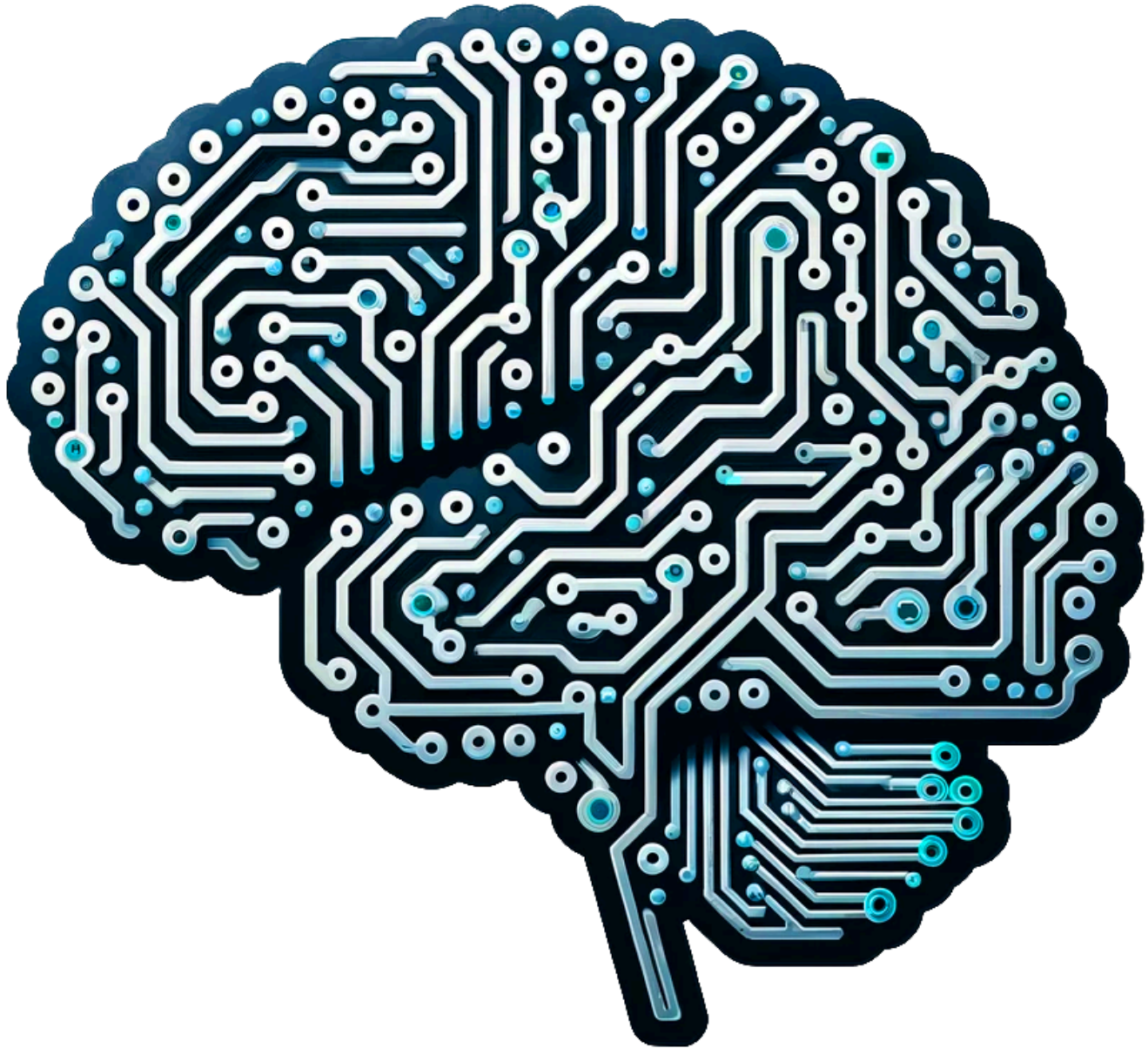
**Track 2:** Non-Fungible Tokens (NFTs)

*Note that your entire solution, including how you represent, store and retrieve data, must run on the Internet Computer.*

*It is not permissible to use services that run outside of the Internet Computer.*

*Points are deducted during the judging process for solutions that utilize services that run outside of the Internet Computer.*

## 5. TRACK 1: Artificial Intelligence (AI)



*Please note that the following instructions are the full extent of detail provided to hackathon competitors. The instructions intentionally do not provide technical specifications, nor technical guidelines. A primary goal of the hackathon is to enable competitors to design their own solutions based on a minimal set of general guidelines.*

# Continuous Authentication using AI-based Face Recognition

The target of this track is to explore the suitability of DFINITY's [face recognition AI example](#) for use in "continuous authentication" as defined by the Knowledge Foundation's [Authentication and Anti-fraud Technology Working Group](#):

- DFINITY's face recognition AI example:  
<https://github.com/dfinity/examples/tree/master/rust/face-recognition>
- Authentication and Anti-fraud Technology Working Group (AAF.TWG):  
<https://KnowledgeFound.org/groups>

## Continuous Authentication

The term "continuous authentication" refers to the authentication of computer or mobile device users over a continuous period of time.

Continuous authentication can be used, for example, to determine if a student (learner) taking an exam on a computer or mobile device is actually the same person over the entire period of time that the exam is underway.

## AI-based Face Recognition

DFINITY's face recognition AI example holds the potential of being a suitable method for implementing continuous authentication.

The purpose of this hackathon is to experiment with DFINITY's face recognition AI example to determine if indeed this approach to continuous authentication is possible.



## Your Solution

Your hackathon solution should utilize DFINITY's face recognition AI example for continuous authentication.

Ideally your solution will periodically obtain the user's face images from the computer or mobile device's **camera** (obtaining the user's face image from the webcam once per minute, for example).

Please note that obtaining face images directly from the device camera (webcam) for "live" realtime image capture is **preferred**. Extra points will be given to such solutions during the judging period.

If you are not able to obtain images of the user's face from the computer or mobile device camera you can instead use a series of photos (JPEG images, for example). In this case you must use photos of yourself and members of your team, and you should supply a series of photos for several people for testing purposes. **Do not use face photos of a person you haven't received permission from** (do not use images from the Internet, for example).



## 6. TRACK 2: Non-Fungible Tokens (NFTs)



*Please note that the following instructions are the full extent of detail provided to hackathon competitors. The instructions intentionally do not provide technical specifications, nor technical guidelines. A primary goal of the hackathon is to enable competitors to design their own solutions based on a minimal set of general guidelines.*

## Experimenting with ICRC-7 NFTs

The target of this track is to experiment with the emerging ICRC-7 non-fungible token (NFT) standard described in the following Developer Journey and corresponding standard specification:

- Creating NFTs on ICP:  
<https://internetcomputer.org/docs/current/tutorials/developer-journey/level-5/5.4-NFT-tutorial>
- ICRC-7 standard specification:  
<https://github.com/dfinity/ICRC/tree/main/ICRCs/ICRC-7>

## Fungibility

The term "fungible" refers to something that can be exchanged or replaced with something else of the same type and value (each unit is interchangeable).

For example, currency is fungible: a \$10 bill can be exchanged for another \$10 bill because both bills have the same value. Likewise, a \$10 bill can be exchanged for any combination of other bills and/or coins that add up to \$10 because their ultimate value is equivalent (and therefore exchangeable).

In contrast, something is "non-fungible" if it is unique and can't be considered equivalent or exchangeable with something else.

## NFTs

An NFT, or non-fungible token, is a unique digital asset. NFTs are commonly used to represent ownership of a specific item, object or piece of content.

NFTs are typically implemented using blockchain technology. Unlike cryptocurrencies (such as Bitcoin), which are fungible and can be exchanged for

one another, NFTs are one-of-a-kind and cannot be replaced with something else: every NFT is unique.

NFTs can represent a wide variety of items, including digital art, music, videos, real estate, and collectibles. The ownership and transaction history of an NFT are recorded on a blockchain, providing proof of authenticity and ownership.

## Your Solution

Your hackathon solution should demonstrate a full experimentation of the ICRC-7 NFT standard to illustrate what these types of NFTs are capable of.

Exactly *what* you do to experiment with ICRC-7 NFTs is your choice provided your solution actually demonstrates the capabilities of the ICRC-7 NFT standard.

Note that there is no single "official" implementation of the ICRC-7 NFT standard.

You can utilize any of the following implementations in your solution, or you can use another implementation if you prefer not to use one of the following.

ICRC-7 NFT standard implementations in Rust and Motoko:

- <https://github.com/PanIndustrial-Org/icrc7.mo>
- [https://github.com/tuminfei/icrc7\\_launchpad](https://github.com/tuminfei/icrc7_launchpad)
- <https://github.com/UncensoredGreats/NFT>
- <https://github.com/pramitgaha21/icrc7>

## Geolocation

An optional, but **preferred**, feature of your solution is geolocation using the HTML Geolocation API. You can utilize geolocation in any way that you wish.

Although geolocation is optional (not required) a solution that utilizes geolocation via the HTML Geolocation API will receive **preference** during the judging process.



# 7. SUBMITTING YOUR SOLUTION

## **SUBMIT YOUR SOLUTION ON TIME!**

For details on **how and when** to submit your hackathon solution please refer to the **SUBMIT YOUR SOLUTION** section of the official hackathon page at:

<https://KnowledgeFound.org/hackathons/virtual/2024>



Knowledge Foundation : <https://KnowledgeFound.org> | Knowledge Token® : <https://KnowledgeFound.org/token>