**What's the name of your team? Who are the team members?**
We are 190Jiers, we are a group consisting of Monica Trinh, Dhruv Aggarwal, and Francisco Leyva.

**Which track did you pick?**
We picked track 5 for our project, a blockchain survey system.

**What's the name of the application that you plan to build?**
Our application is named SurveyChain

**A brief introduction and overview of the system.**

SurveyChain leverages blockchain technology to ensure transparency, security, and anonymity in collecting user responses for surveys. Our system offers a seamless experience for both survey creators and participants, incorporating features like customizable account names, secure login using blockchain addresses, and efficient survey management.

The blockchain survey system simplifies the process of creating, managing, and participating in surveys while maintaining integrity and reliability. Here's a breakdown of its main functionalities:

1. **Account Management:** Users can register customized account names and utilize their blockchain addresses for logging into the survey system. Registration is required only for creating new surveys; participation in surveys is open to all, without the need for registration.
2. **Survey Creation:** Registered users can create new surveys by providing a problem description and defining several numerical options for respondents to choose from. Each survey is assigned an expiry block timestamp and a maximum limit for the number of data points it can accept.
3. **Survey Participation:** Participants can view active surveys and their available options by accessing their respective IDs. They can submit their choices once for each survey ID.
4. **Survey Closure:** Survey owners have the authority to close their surveys manually or wait for them to automatically close after reaching the expiry block timestamp or the maximum accepted data points. Upon closure, participants receive rewards in ETH for their contributions.
5. **Closing Mechanism:** Surveys close either upon reaching the expiry block timestamp or when all incoming data points are received within the same block, ensuring fairness and accuracy in the survey results.

With these features, our blockchain survey system offers a user-friendly solution for collecting anonymous user responses securely and efficiently.

**Application development timeline and distribution of work between team members.**

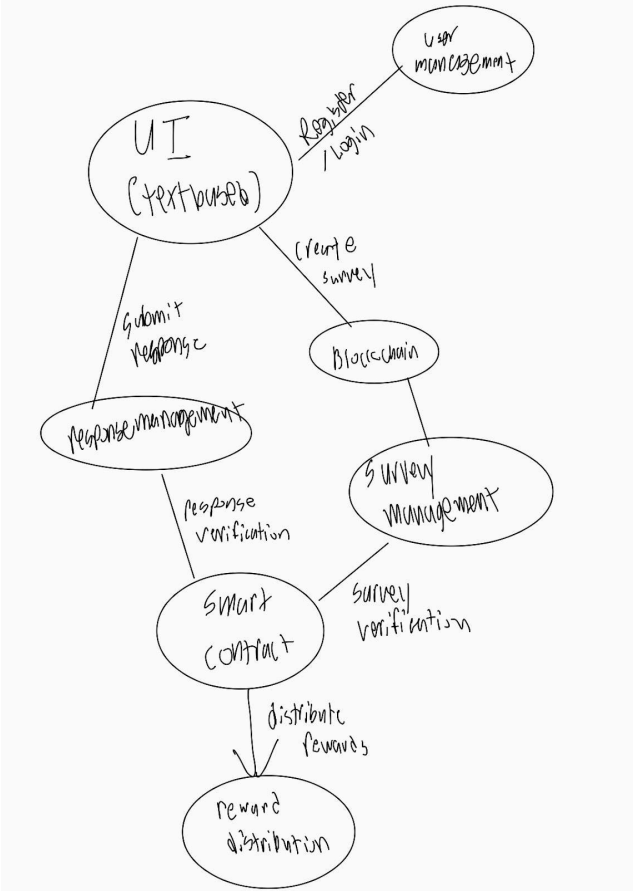
As of now, we don't have an exact schedule of how long each task will take, but they are listed below. We will divide up labor as time goes forward, but for now, Monica and Dhruv are focusing on smart contract development while Francisco works on back-end integration.

1. Smart Contract Development
2. Back-End Integration
3. Testing & Security Audits
4. Finalization
5. Poster + Logistic Work

**A brief discussion about potential security issues and your key designs to prevent them.**

1. Reward Manipulation
    a. Implement strict rules and checks in smart contracts to ensure fair distribution of rewards.
    b. Use cryptographic techniques to verify legitimate participation
2. Anonymity
    a. Anonymize responses while keeping reliable records of participation.
    b. Use zero-knowledge proofs to ensure participant privacy
3. Data Integrity
    a. Leverage blockchain immutability to ensure data cannot be altered after being recorded.
    b. Use hash functions to verify data integrity
4. Double Voting
    a. Implement unique IDs for each participant's response to ensure only one submission per user
    b. Use cryptographic signatures to verify single participation.
5. Survey Creation Abuse
    a. Implement moderation and reporting mechanisms to prevent spam and inappropriate surveys.
    b. Use decentralized governance to allow the community to flag and review surveys

**Draw a figure with detailed description (in text) about the overall framework or workflow of your application, which should include (but not restricted to): key components/classes and data structures, inputs/outputs.**




**Key Components and Data Structures:**

1. User Interface:
   - Description: The front-end interface that users interact with to create surveys, view active surveys, and submit responses.
   - Inputs: User actions such as survey creation details and survey responses.
   - Outputs: Forms for survey creation, lists of active surveys, and response submission forms.

2. User Management:
   - Description: Handles user registration, login, and account management.
   - Data Structures: User profiles including blockchain addresses and account details.
   - Inputs: Registration and login requests.
   - Outputs: Authentication tokens or session management.

3. Survey Management:
   - Description: Manages the creation, storage, and retrieval of surveys.

- Data Structures: Survey objects containing survey IDs, creator IDs, question text, numerical options, expiry time, and maximum data points.
- Inputs: Survey creation details from users.
- Outputs: Stored survey details.

4. Response Management:
- Description: Handles submission, storage, and retrieval of survey responses.
- Data Structures: Response objects containing survey IDs, participant addresses, and selected options.
- Inputs: Responses submitted by users.
- Outputs: Stored responses, ensuring one response per user per survey.

5. Smart Contracts:
- Description: Implements business logic for survey creation, participation, and reward distribution.
- Data Structures: Smart contract code that includes functions for storing survey details, storing responses, and distributing rewards.
- Inputs: Survey and response data from Survey Management and Response Management.
- Outputs: Immutable records on the blockchain and triggers for reward distribution.

6. Blockchain:
- Description: Stores all immutable data related to surveys and responses, ensuring data integrity and transparency.
- Data Structures: Blockchain ledger entries for survey details and responses.
- Inputs: Data from smart contracts.
- Outputs: Verified and immutable data records.

7. Reward Distribution:
- Description: Manages the distribution of rewards to survey participants.
- Data Structures: Reward distribution logic and participant reward records.
- Inputs: Trigger events from smart contracts upon survey expiry or maximum data points reached.
- Outputs: Distributed rewards to participants' blockchain addresses.

**Workflow**

1. User Registration and Login:
- Users register and log in through the User Interface, which communicates with User Management to authenticate users.

2. Survey Creation:
- Registered users create surveys via the User Interface, which sends the survey details to Survey Management.
- Survey Management passes the details to Smart Contracts, which store the survey details on the Blockchain.

3. Response Submission:
   - Participants view active surveys and submit their responses through the User Interface.
   - The responses are sent to Response Management, which verifies the uniqueness of each response and then passes them to Smart Contracts.
   - Smart Contracts store the responses on the Blockchain.

4. Reward Distribution:
   - Upon survey expiry or when the maximum number of responses is reached, Smart Contracts trigger the Reward Distribution process.
   - Rewards are distributed to participants based on predefined rules, and the transactions are recorded on the Blockchain.

**Any other discussions that you think make your application different than others'.**

1. Customizable Reward Structures
    a. Survey creators can set different reward structures based on the importance or complexity of the survey.
    b. Bonus rewards can be distributed based on predefined criteria such as insightful feedback.
2. Decentralized Governance
    a. Users can flag inappropriate surveys, which will be reviewed by moderators, ensuring fairness and preventing abuse.
3. Reputation System
    a. A reputation system can be implemented where higher reputation users have their surveys appear near the top of the list and receive more rewards for their participation in surveys.