**9.3HD: Research project initial plan**

1, A basic overview of my project (classic snake game):

The planned research project focuses on the development of a classic Snake game, aiming to provide a hands-on exploration of game development fundamentals. Beginning with comprehensive research into game design principles and programming concepts, the project seeks to establish a solid foundation for implementation. Through meticulous planning, including the delineation of game mechanics, user interface design, and project milestones, the project will ensure a systematic approach to development. By leveraging suitable programming languages and game development frameworks, the implementation phase will involve coding key features such as snake movement, food generation, and score tracking.

Testing will play a pivotal role in the project, with thorough evaluations conducted to identify and rectify any bugs or glitches. Ensuring the game's functionality across various platforms and devices will be a priority during this phase. Moreover, user feedback will be solicited to refine the game's mechanics and user experience, fostering an iterative development process. By iterating on the design based on user input, the project aims to deliver an engaging and polished gaming experience.

In conclusion, the Snake game project presents an invaluable opportunity to delve into the intricate world of game development while honing programming skills and problem-solving abilities. Through meticulous research, planning, development, testing, and iteration, the project aims to deliver a fully functional and enjoyable gaming experience. By following a structured approach and leveraging feedback from testers and users, the project endeavors to provide valuable insights into game design principles, programming techniques, and project management practices.

2, My project related to knowledge in this OOP course.

The project of the Snake game serves as a practical demonstration of the application of Object-Oriented Programming (OOP) concepts acquired within the C# programming language. As students engage in the development of this game, they have the opportunity to reinforce their comprehension of fundamental OOP principles and how they can be implemented in real-world situations. A significant aspect to consider is abstraction, which involves representing game elements such as the snake, food, and game board through classes with clearly defined attributes and behaviors. This approach encourages the creation of modular and easily maintainable code structures.

Encapsulation assumes a critical role in guaranteeing the integrity and security of the components within the game. Through the encapsulation of data and methods within classes, developers are able to manage access to the internal mechanisms of each element effectively. This practice helps prevent unintended alterations and fosters stability within the codebase. For example, by encapsulating the logic for the movement of the snake within its corresponding class, developers can achieve a clear separation of concerns. This separation facilitates future modifications or expansions without causing disruptions in other sections of the codebase.

Furthermore, this project offers numerous opportunities for students to delve into the concepts of inheritance and polymorphism, which are foundational elements of OOP. Inheritance allows for the establishment of subclasses that inherit attributes and behaviors from a parent class. This capability empowers developers to organize and enhance the functionality of the game efficiently. On the other hand, polymorphism enables adaptable and dynamic behavior through mechanisms such as method overriding and interface implementation. These features facilitate interactions between diverse game elements while upholding a coherent code structure. By incorporating these OOP principles into the development of the Snake game, students can elevate their programming aptitude and cultivate a deeper understanding of the principles underlying object-oriented design.