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UWTSD ACCA5033

Changemakers Creativity & Value Creation

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Submission date: 13-Mar-2026 01:21PM (UTC+0000)

Submission ID: 277256343

File name:

21880_Sanwar_Ahmed_Sanwar_Ali_Ahmed_1920465_UWTSD_ACCA5033_Changemakers_Creativity__Value_Creation_719466_1538577781.pdf
(6.33M)

Word count: 2198

Character count: 12319

Title

Friday, 13 March 2026

12:45

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Changemakers: Creativity & Value Creation

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TASK 1

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TASK 1

1 Innovation is Everywhere

Everyday Products & Services

Smart Thermostats

Beyond basic programming, smart thermostats learn your schedule and preferences. Sensors detect occupancy, adjusting temperature automatically. Remote control via smartphone saves energy (10-12% on heating/cooling). Future: Predictive learning, personalized profiles, and energy grid integration.

Online Grocery Delivery

More than just ordering online! Sophisticated logistics, inventory management & algorithms optimize routes and predict demand. Convenience is key. Future: Drone delivery, personalized recommendations based on dietary needs, & integration with meal planning apps.

Reusable Water Bottles

A conscious shift from disposable plastic, now with durable materials (stainless steel, Tritan) and stylish designs. Future: Built-in filtration, smart tracking of water intake, & recycled ocean plastic construction.

Electric Toothbrushes

Offer superior cleaning through oscillating/rotating vibrations, timers & pressure sensors. Future: AI feedback on brushing technique, personalized cleaning modes linked to dental records, and subscription services for brush heads.

Communication & Technology

Text Messaging (SMS)

Revolutionized communication with instant, asynchronous messaging. Future: RCS offers richer media & improved security; AI chatbots for automated customer service.

Video Conferencing

Enables face-to-face communication regardless of location. Future: Immersive VR/AR experiences, real-time translation, and integration with metaverse platforms for interactive meetings.

GPS Navigation

Real-time routing & traffic data optimize travel. Future: Autonomous vehicle integration, AR overlays projecting directions onto the real world, and predictive routing based on weather.

One of the most impactful inventions in modern society is the printing press. "Invented by

Johannes Gutenberg in 1450, the printing press enabled the mass production of books and instigated a new age of enlightenment, as the ability to reproduce knowledge" [1]

2 Ideation

Snake Game

Creating a simple web-based game accessible to everyone on laptop and mobile phones via website, no logins required, quick pick-up and play, people who unable to concentrate or need to refocus, modern games required too much effort, and commitment, financially and mentally.

Pinball

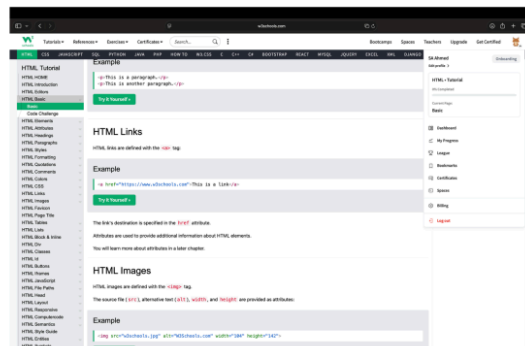
Physical pinball game pre-introduces physical contact with physics gameplay, young children acclimatised to virtual gameplay, like the snake game this is pick up and play, no commitments or calls.

I will be choosing snake game project for my assignment title **Snake Mania** this will be programmed in HTML JAVA SCRIPT CSS SVG accessible via any web browser without logging instantly playable on laptop and mobile phones

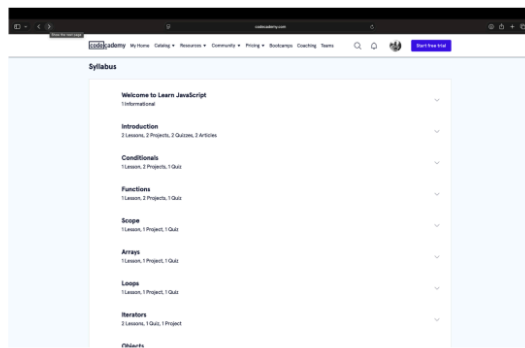
“After launching in 1997 on the Nokia 6110, Snake quickly became a phenomenon. The game’s developer Taneli Armanto discusses its origin and digital legacy.” [2]

3 Research

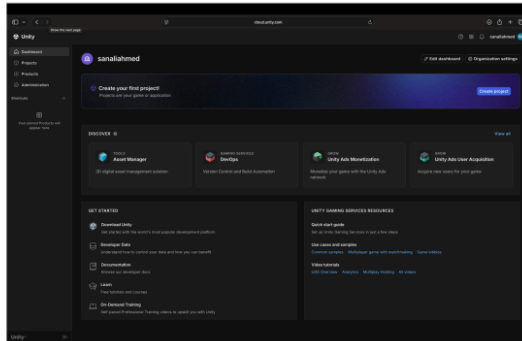
To learn HTML CSS I have enrolled in W3 Schools



Registered with code Academy for JavaScript



Game development with unity



Combined courses should give essential knowledge to create a basic game

TASK 2

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TASK 2

1 Document the Project Scope

Proposed Solution:

The **Snake Mania** project aims to develop a lightweight, browser-based game designed specifically for cognitive refocusing and accessibility. The core solution is a responsive web application built using standard web technologies that requires no installation or login. Unlike modern titles requiring high-end hardware or complex tutorials, Snake Mania prioritizes immediate engagement through intuitive controls keyboard on desktop, touch swipe on mobile. The core will utilize HTML for structure, CSS for styling and responsiveness, and JavaScript for game logic to ensure maximum performance across devices without external dependencies like heavy frameworks.

Required Technologies/Resources

To achieve the aim of universal accessibility, the following resources are required: Development Environment A code editor Visual studio or HTML editor

Project Timeline & Task Schedule

The project is estimated to take four weeks approximate from inception to deployment

Week 1 Requirement analysis and UI.

Week 2 Core development of game logic movement, collision detection.

Week 3 Responsive design implementation and mobile touch controls integration.

Week 4 Testing, bug fixing, and final deployment to a static hosting service.

2 Charting Project



“Charting on timelines is crucial in projects because it transforms plans into a clear visual sequence of tasks, deadlines, and dependencies. It helps teams track progress, allocate resources efficiently, identify potential delays, and monitor key milestones, while providing stakeholders with an easy-to-understand overview. By highlighting critical paths and risks early, timeline charts enhance planning, coordination, and overall project control.” [3]

3 Risks/Challenges

Snake Mania Challenges

To ensure the successful delivery of Snake Mania, three primary risks have been identified. Each includes a specific challenge description and a practical mitigation strategy to minimize impact on the project timeline and quality.

Challenges

Mobile Responsiveness & Touch Controls

Web-based games frequently encounter issues on mobile devices due to differences in how touch events are handled compared to mouse clicks. If the game interface does not scale correctly, or if touch controls feel imprecise accidental swipes, user frustration will increase, reducing engagement with the quick pick-up.

Different web browsers Chrome, Safari, Firefox, Edge may interpret HTML5 Canvas or SVG rendering slightly differently. This can cause visual glitches or logic errors in the game loop, especially on older devices or operating systems

Resolutions

Medication would alleviate most of these problems

CSS Media Queries Use CSS media rules to ensure the game canvas resizes automatically to fit different screen widths and heights without distortion.

Focus initial testing on Chrome and Safari, as they cover approximately 90% of mobile web traffic, ensuring most users have a smooth experience
use old standards of JavaScript and core coding components.

Laptop desktop users on top these problems above navigation will be used to physical keyboards with Arros keys as default, screen resolution issues medicated by default.

TASK 3

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TASK 3

1 Development method

For the Snake Mania project, an Iterative Incremental Development Method is the most suitable approach to plan and complete the application. Unlike a traditional Waterfall model where all requirements must be finalized before coding begins, this method allows for the game to be built in small, testable cycles. This is particularly effective for web-based games because it enables developers to verify core mechanics

The development process was structured into three primary phases

Core Logic Phase The initial focus was on the game Loop function and the HTML5 Canvas rendering engine. This ensured that the snake moved correctly, ate food, and handled collisions before worrying about aesthetics.

UI Integration Phase Once the logic was stable, CSS styling (using the 'Press Start 2P' font for a retro feel) and DOM manipulation were added to create the "Attract Mode" title screen and control buttons.

Feature Expansion Phase Advanced features like the AI bot (calculateAIMove) and persistent high scores using local Storage were implemented last

This method helps manage complexity by breaking the project into manageable chunks. For example, if a bug occurs in the collision detection code, it can be isolated without affecting the title screen or sound effects. It also facilitates "playtesting" early on; once the snake moves, a user can test responsiveness immediately

2 Design work

1. UI Layout Specification Wireframe

The user interface was designed with a "Single Page Application" architecture, meaning all game states exist within one HTML file without reloading. The layout is defined by two main containers that are visually represented in the wireframe below.

Key UI Components

Global Controls Bar A horizontal bar containing buttons for Start, Pause, Restart, and Reset positioned above the game canvas

Game Container A fixed-size (400x400px) canvas area that acts as the viewport with absolute positioning for overlays

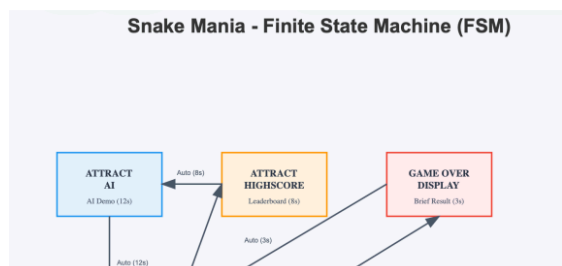
Overlay Screens Three main overlay states (Title Screen, High Scores, Game Over) that appear on top of the canvas

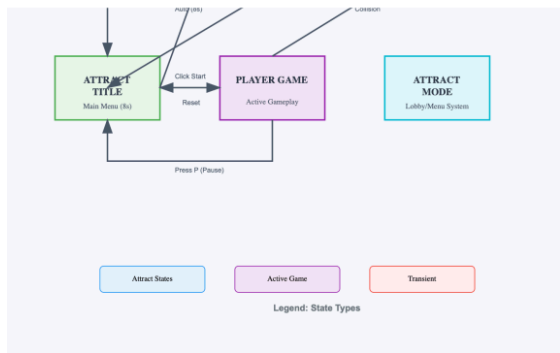
2. Finite State Machine (FSM) Diagram

The core logic of the game is governed by a Finite State Machine design pattern. The switchAppState function acts as the central controller that transitions between distinct states based on user interaction and time-based events

STATE 2000 ON 200: HIGHSCORE AND 2000 STATE.

FSM logic





"A **finite state machine** (sometimes called a finite state automaton) is a computation model that can be implemented with hardware or software and can be used to simulate [sequential logic](#)" [4]

Logic Flow of the Snake Mania FSM

The Snake Mania game uses a **Finite State Machine (FSM)** to control how the game moves between different screens and gameplay modes. Each state represents a specific part of the game, and transitions occur based on **time limits or player actions**.

1. Attract Mode

When the game is idle, it runs in **Attract Mode**, which automatically cycles through three screens.

ATTRACT_AI

- Displays an AI demonstration of the game for **12 seconds**.
- Then moves to **ATTRACT_TITLE**.

ATTRACT_TITLE

- Shows the **main menu** for **8 seconds**.
- The player can press **Start** to begin the game.

ATTRACT_HIGHSCORE

- Displays the **leaderboard** for **8 seconds**.
- Then returns to **ATTRACT_AI**, creating a loop.

2. Gameplay

=====

PLAYER_GAME

- The player controls the snake, collects food, and avoids collisions.

Transitions

- Collision with wall or snake → **GAME_OVER_DISPLAY**
- Reset or pause → return to **ATTRACT_TITLE**

3. Game Over

GAME_OVER_DISPLAY

- Shows the final score for **3 seconds**.
- Then returns to **ATTRACT_TITLE**.

3 initial practical implementations

The following sections document three key stages of the initial practical implementation for Snake Mania. These screenshots illustrate how the design plans were turned into working code. Each image shows a different part of the game, from the main playing area to the menus and score saving system.

Screenshot 1 Active Gameplay State

Description: This screenshot shows the main screen where the player plays the game. You can see a black grid with green blocks representing the snake. The snake moves around trying to eat the colored squares (food) that appear on the grid. Each food square has a number inside it, showing how many points you get for eating it.

This part of the code uses an HTML5 <canvas> element. In the JavaScript file, there is a function called drawGame() which runs every time the game updates. It clears the screen and redraws the grid and snake positions. The green color comes from the CSS style defined in the <style> section of the HTML file. This proves that the basic movement and drawing systems are working correctly on both laptop screens and mobile phones.

Screenshot 2 Title Screen Animation

Description: This image shows what happens when you first open the game before clicking "Start". The screen displays the text "Snake Mania" in a pixel-style font, along with your name and the year. At the top of the grid, there is a small green snake moving back and forth automatically.

This animation is created using JavaScript functions like initTitleSnake() and titleSnakeLoop(). These functions create a simple version of the snake that moves on its own to attract attention. The text is loaded from Google Fonts (Press Start 2P) as seen in the <head> section of the HTML file. This screen acts as a welcome page, providing the user

the <head> section of the HTML file. This screen acts as a welcome page, ensuring the user knows what game they are about to play before starting.

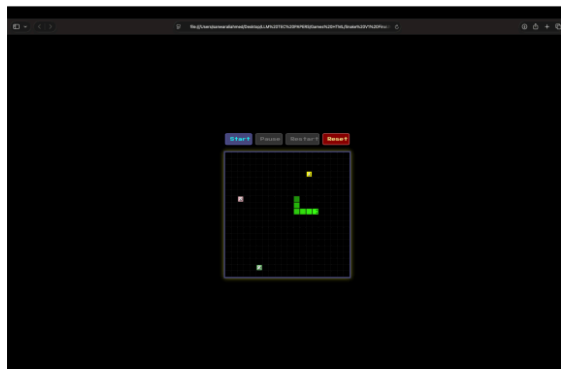
Screenshot 3 High Score Persistence

Description: This screenshot shows the "High Scores" list that appears after you finish playing or reset the game. It lists your top five scores (e.g., 60, 52, 34) with numbers next to them. Even if you close the browser window and open it again later, these numbers stay there.

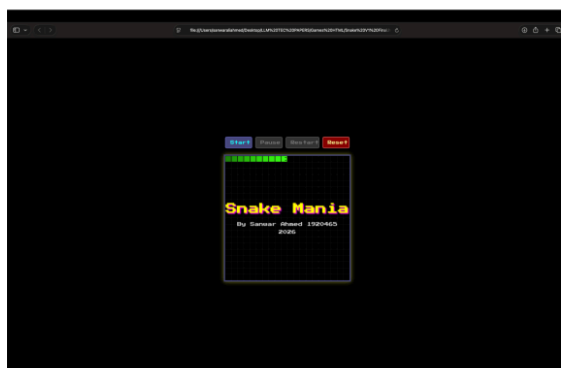
This feature uses a part of the web browser called `localStorage`. In the JavaScript code, there is a function named `saveHighScores()` that stores your best scores in the browser's memory instead of sending data to a server. This means you don't need an internet connection or a login system to keep track of your progress. It makes the game very easy to pick up and play again later without losing your achievements.

Screenshot 1: Active Gameplay State

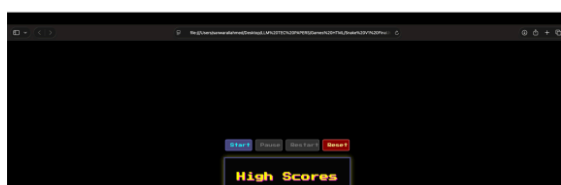
-----> Snake Mania <-----

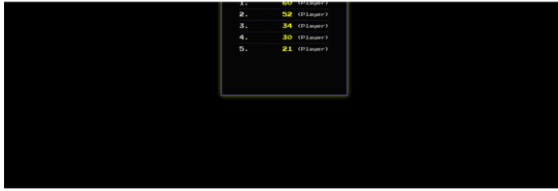


Screenshot 2: Title Screen Animation



Screenshot 3: High Score Persistence





Implementation Summary

These three screenshots show that the project is moving from ideas into real code. The Gameplay Screen proves the snake moves and eats food correctly. The Title Screen shows how the user starts the game smoothly. Finally, the High Score List confirms that your progress is saved safely in the browser. Together, these steps confirm that the "Snake Mania" complete game finalised, ENJOY.

END

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Bibliography

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- [3] C. GPT, *Important of schedules and charting*, Chat GPT, 2026.
- [4] F. S. Machines, ". Brilliant.org.," 03 2026. [Online]. Available: <https://brilliant.org/wiki/finite-state-machines/>. [Accessed 03 2026].

75/100

Total: 75

1. Engagement with Literature Skills

+ Some use of citations and references included. – could be extended. 8

+ IEEE reference list format. Good.

2. Knowledge and Understanding Skills 5, 5, 5

T1Q1 Innovation: + Good overview of relevant innovations. Some knowledge and understanding of some unit 1 topics are covered. – Some additional 'concepts' from unit 1 could be included. 14

T1Q2 Ideation: + Several project ideas documented. And 1 project area selected.

T1Q2 T-A&Os: + Aim and brief description are clearly documented. Good.

- A project title and several Objectives are not documented

T1Q3 Research: + Evidence of some key courses and sources is documented. – Course

content could be briefly described i.e. briefly state how each will help you to complete your project aim/objectives.

3. Cognitive and Intellectual Skills 5, 5, 5, 5

T2Q1:

16

+ Project **solution**
and required technologies/resources
documented. Good.

+ **Project timeline** and **task schedule**
documented. –
Timeline dates are not clearly stated.

T2Q2: + **Gantt chart** created, documented.
- Unable to read the
Gantt chart.

+ Key stage descriptions are good, clear and
valuable.

T2Q3: +/- Some development
risks/challenges and contingencies are
documented. Good. These could also relate
to the project as a whole, not only
the user perspective. Although they are
useful and valuable.

4. Practical Application Skills 5, 10, 5

T3Q1: + A suitable

20

Development method to plan and
complete the project is clearly
described.

T3Q2: + Evidence of x2 **Design work**
documented.

T3Q3: + Use of several screenshots with
brief
description to show some **initial practical**
implementation is
documented. Good.

5.

Transferable Skills for Life and Professional Practice 10, 5, 5

+ Format, structure and
presentation. Good.

17

+ Title
page.

+ Spelling and grammar.

- Figures
could be labelled.

Appendix:

+/- Evidence of engagement with a relevant course documented. Somewhat located in the main body. Progress also needs to be documented in the appendix.

+ Evidence of use of a relevant Digital tool e.g. Project Planning / Management tool is documented. = Main body.

On-time/Late: OT.

Good project idea. Good start. Good luck with the implementation. Looking forward to seeing how it turns out.

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