**Outline**

Play the original Simon game to establish a mind-set around basic game systems. Research the history of game systems. Analyze the Simon game from an input-process-output perspective.

**Objectives**

* Use the input-process-output model to solve programming problems.
* Use industry-standard programming tools (e.g., UML [Unified Modeling Language], diagrams, structure charts, flow charts, pseudocode) to develop a software project.

**Materials**

* Simon game obtained from teacher

**Level 1: Start of Game - Input / Output Analysis**

Explore the Simon Game and Instruction Booklet to understand how the game works with respect to starting a new game.

1. Describe how to start a new game in your own words using point form.

To start a new game of Simon you have to click the button in the middle and follow the pattern the game displays.

1. Re-format your answer to question #1 above to identify and list all the steps required to start a new game.
   * Use an IF … THEN… statement format.
   * e.g. IF the user presses a green button THEN the game flashes a green light

If the user clicks the button in the middle then the game will make a noise and light up a color.

1. List all of the user input objects and actions using a table similar to the one below.

|  |  |  |
| --- | --- | --- |
| **Object** | **Action** | **Result** |
| e.g. Red Button | e.g. Push | e.g. Record a step in the pattern |
| Blue button, green button, yellow button | Push | Records a step in the pattern |
| Small round button | Push | Starts game, picks which game mode the user wants to play |

1. List all of the user output objects and actions using a table similar to the one below.

|  |  |  |
| --- | --- | --- |
| **Object** | **Action** | **Meaning** |
| e.g. Red Light | e.g. Play tone | e.g. Indicates a step in the pattern |
| Blue, green, yellow lights | Play a tone | Shows another step in the pattern |
|  |  |  |

**Level 2: Game Play - Input / Output Analysis**

Explore the Simon Game and Instruction Booklet to understand how the game works with respect to playing the game.

1. Describe how to play the game in your own words using point form. Assume that the pattern is at the 3 tone stage (e.g. Red, Green, Blue).

To play the game the user must memorize the pattern it is given by the game and repeat the same pattern by clicking the colored buttons.

1. Re-format your answer to question #1 above to identify and list all the steps required to start a new pattern.
   * Use an IF … THEN… statement format.
   * e.g. IF the user presses a green button THEN the game flashes a green light

If the user memorizes the pattern and repeats it they will succeed to the next level.

1. Re-format your answer to question #1 above to identify and list all the steps involved in successfully completing the pattern (e.g. Red, Green, Blue).
   * Use an IF … THEN… statement format.
   * e.g. IF the user presses a green button THEN the game flashes a green light
2. Re-format your answer to question #1 above to identify and list all the steps related to making a mistake in the pattern (e.g. Red, Green, Red).
   * Use an IF … THEN… statement format.
   * e.g. IF the user presses a green button THEN the game flashes a green light
3. List all of the user input objects and actions using a table similar to the one below.

|  |  |  |
| --- | --- | --- |
| **Object** | **Action** | **Result** |
| e.g. Red Button | e.g. Push | e.g. Record a step in the pattern |
| Blue button | Push | Record a step |
| Green Button, Yellow Button | Push | Record a step |

1. List all of the user output objects and actions using a table similar to the one below.

|  |  |  |
| --- | --- | --- |
| **Object** | **Action** | **Meaning** |
| e.g. Red Light | e.g. Play tone | e.g. Indicates a step in the pattern |
| Blue, yellow, green light | Play tone | Display a pattern step |
|  |  |  |

**Level 3: Flowchart Conventions**

Research and explore how flowchart symbols can be used to represent pseudo code for computer programs.

1. Read the background information at: <https://www.smartdraw.com/flowchart/>
2. Hand draw and explain each of the basic flow chart symbols.
3. Find an example flow chart that uses each basic symbol at least twice. Hand draw the flow chart and explain the logic flow using words in point form.

**Level 4: Flowchart the Simon Game**

1. Create a flow chart showing the pseudo code for a three-tone pattern game you described in your Level 2 answers.