**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 would have to first click the red or green button depending on if you would like to play solo or as a group. After you choose what you would want to play you could start by hitting the button the game first lighted up.

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 you want to play solo then you would hit the red button.

If you want to play as a group then you would hit the green.

If the colors light up then you remember them and repeat the colors back to the game.

If you are playing solo then you would hit the buttons in order as long as you can remember until you forget and hit a wrong button and lose the game.

If you are playing party then you would hit the buttons on your turn and when your turn is done you would pass it on to the next player this continues until someone forgets the pattern.

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 |
| Red Button | Push | To start a solo game |
| Green Button  Red button  Any Button | Push  Push  Push | To start a group game  To continue the pattern  Game starts up then u choose your mode |

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 |
| Red light | Lights up | Lights up and says solo game |
| Green Light  Red, Blue, Green, Yellow  All button  Sounds | Lights up  Lights up  Lights up  Makes noise | Lights up and says group game  Lights up in pattern and player has to click them  The game has woken up  To show the game has woken up |

**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).

You would choose whether you want to play solo or as a party and then you would hit the colors in order to continue the game. You remember the pattern and continue to click it how the game was shown to continue to keep advancing to the next level.

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 Red light then green light then blue light lights up then you would hit the buttons in that order to continue the game and to keep making it to the next level.

If the game shows the lights in a certain pattern then the player would correspond in the same way by pressing the pattern.

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

If the game sets a specific pattern then the player has to hit the specific patterns to continue advancing.

If the player hits the wrong button then the player loses and has to restart the game over again.

1. 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

If the player hits the wrong button from which the game had shown then the player loses.

If the player hit the wrong player then the player would have to restart.

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 |
| Right button | push | Records a step in pattern |
| Wrong button button | push | Hitting the wrong button makes you lose |

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 |
| Red light | Lights up | Indicates a step in the pattern |
| Red, Green, Blue, Yellow  Sound | Lights up  Makes noise | Indicates a long pattern for the player to remember  Makes noise every time right button is hit |

**Level 3: Flowchart Conventions**

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

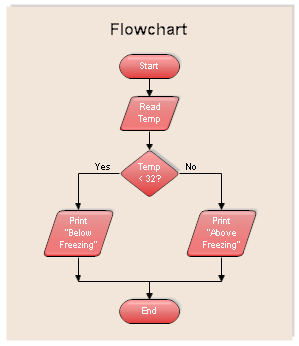
1. Read the background information at: <https://www.smartdraw.com/flowchart/>
2. Hand draw and explain each of the basic flow chart symbols.

Shapes with rounded edges indicate start and end points of a flow chart.

Rectangles represent the middle boxes of a flow chart.

1. 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.

For this flowchart it is detecting the temperature and it begins with the a oval to show that it is the starting part. Then it goes to a four sided figure in a parallelogram to show that it is the next box. In this flow chart the next part is reading the temperature. After that it is another four sided figure to show that the flowchart isn’t finished and this represents if it above or below 32 degrees. Then it goes to two boxes which are parallelogram one side shows whether it is under 32 degrees and the other side shows if it is over 32 degrees. After that it goes into an oval figure showing that the flowchart is finished.

[](https://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=2ahUKEwjgy7X2haHZAhVq6IMKHQXKD74QjRx6BAgAEAY&url=https://www.rff.com/flowchart_samples.php&psig=AOvVaw1__ECuZODM2T8yoMH-TcCf&ust=1518547725844148)

**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.