GP106 Computing Project Flow Chart

Group B7
Semester 02
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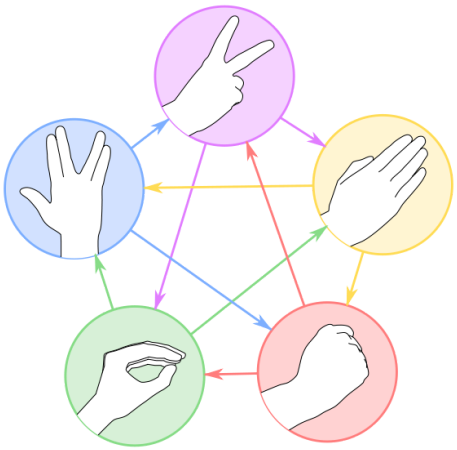
Code Concept:



In this game, each choice is represented by a number:

1 for "Scissors" 2 for "Paper"
3 for "Rock" 4 for "Lizard"
5 for "Spock"

By studying the game's dynamics, a clear pattern appears for instance, "Scissors" (1) defeats "Paper" (2) and "Lizard" (4), while "Paper" (2) triumphs over "Rock" (3) and "Spock" (5). This pattern reveals a simple rule: each choice (X) can overpower the one that follows it (X+1) and the one exactly three steps ahead (X+3) in the sequence of numbers. This insight forms the foundation for developing a code that streamlines gameplay based on these intuitive rules.

The game runs for 7 rounds, but if a player wins 4 rounds, the game stops and that player is declared the winner. Additionally, the game can be ended at the end of any round by pressing a button.

Design Choice:

The game starts with 5 LEDs, which increase in brightness and then suddenly turn off. After that, the choices are displayed on the screen, and an indicator LED lights up. The player is allowed to choose an option by pressing a button from a set of 5 buttons. If the player makes a choice before the time ends (3 seconds), their choice is considered. If the player delays, their choice is ignored. The indicator LED will turn off when the player presses the button or when the time ends, accompanied by a buzzer sound.

Next, the computer selects a choice, and the corresponding LED in the 5 LED set lights up to indicate the computer's choice. The choices are then compared to determine the winner. If the player did not make a choice, the computer is declared the winner of the round. A message is printed on the screen declaring the winner, and the corresponding set of LEDs will light up to indicate the winner. If both players win, both sets of LEDs will light up.

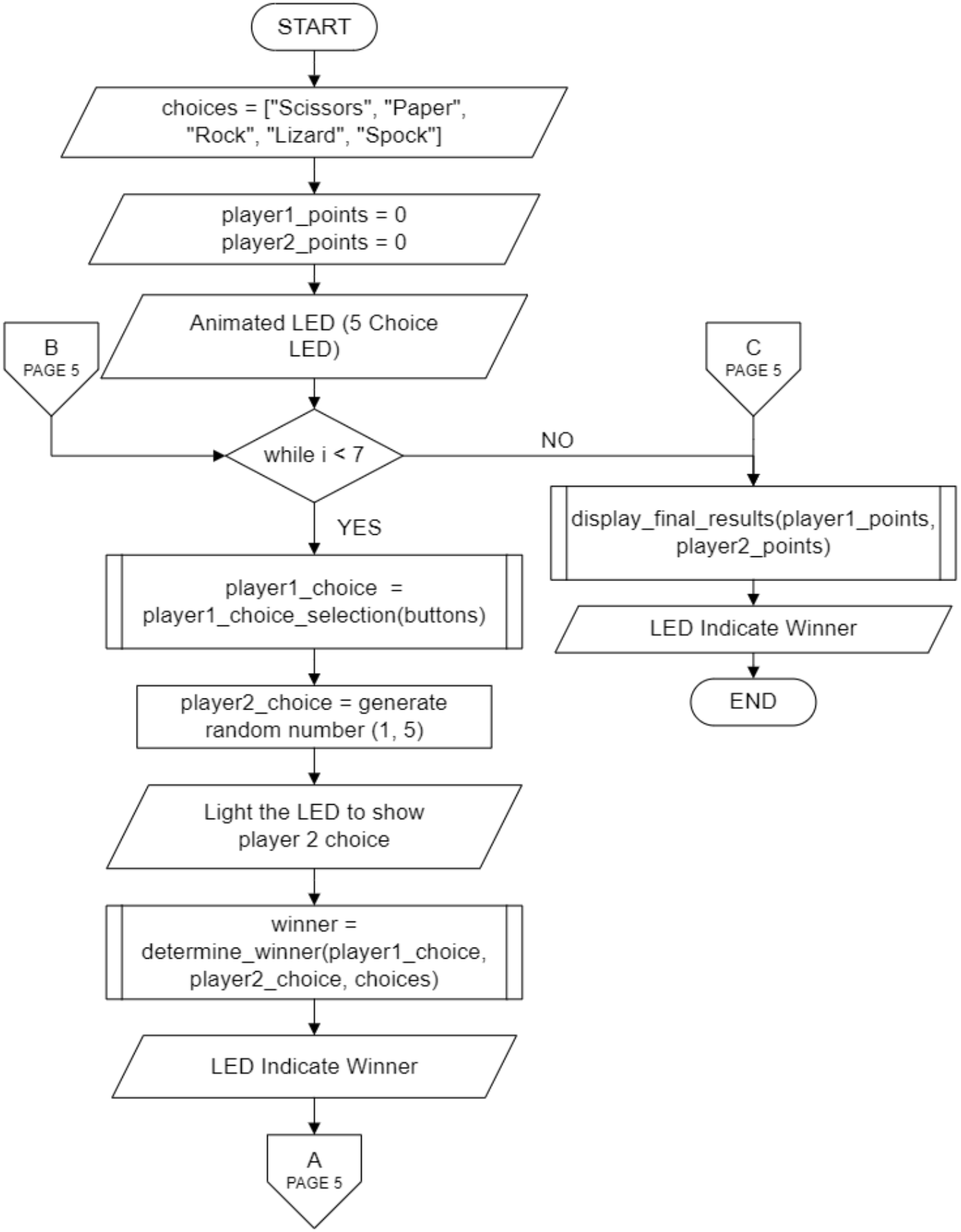
Points are then computed, and the LED sets display the corresponding scores of the players. Each player has 2 sets of LEDs to indicate their score in binary, up to a maximum of 3 points. The game loops for 7 rounds in this manner. If any player reaches 4 points before the end of 7 rounds, that player is announced as the winner using the LEDs, and the final scores are printed on the screen and indicated using the player LEDs.

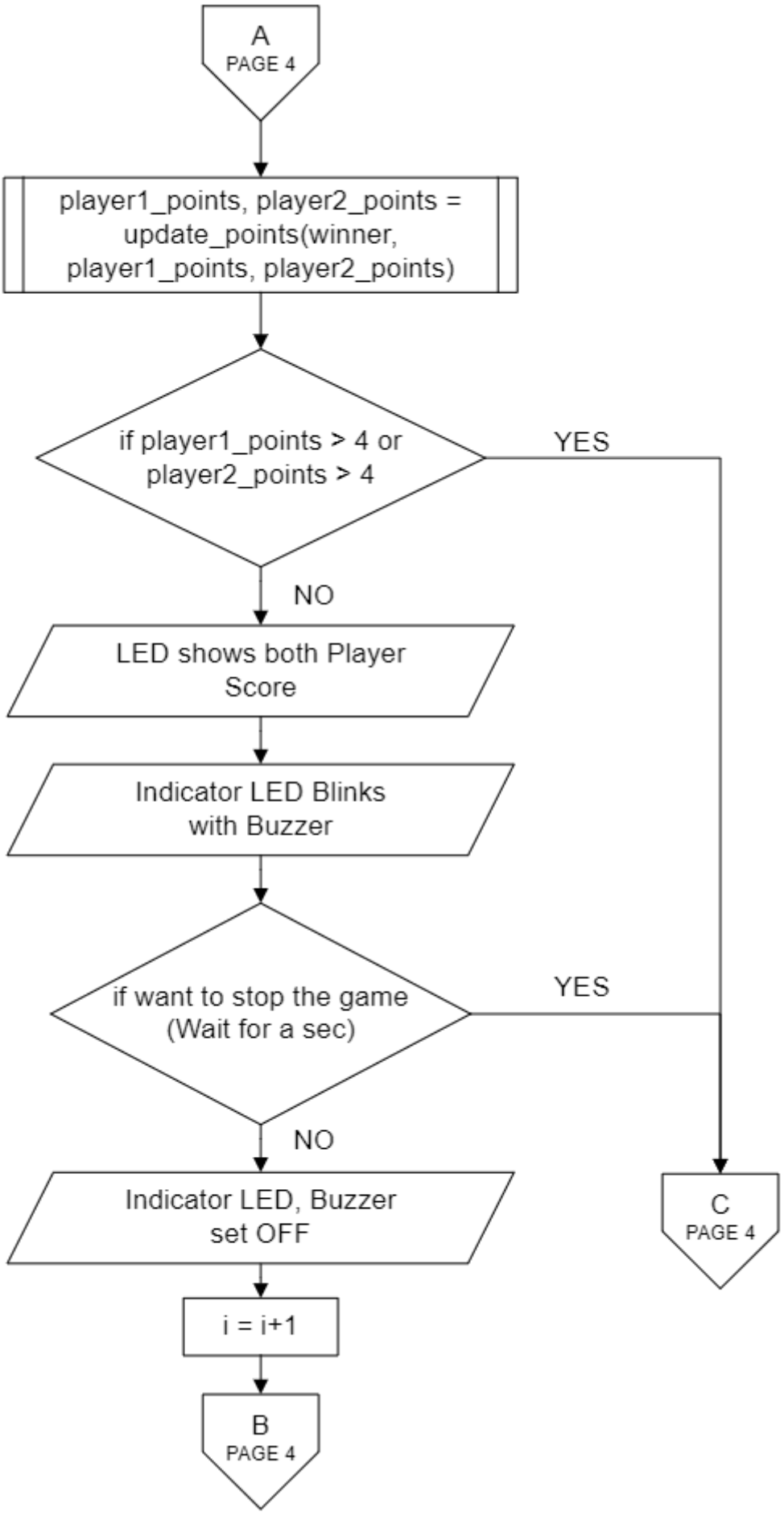
Additionally, there is one button available to quit the game at the end of each round. At the end of each round, the LED indicator turns on with a buzzer sound for a second, allowing the player to quit the game if desired. If the player chooses to quit, the final results are displayed at that time, and the LEDs indicate the winner accordingly.

The sets of buttons and LEDs in the hardware are as follows:

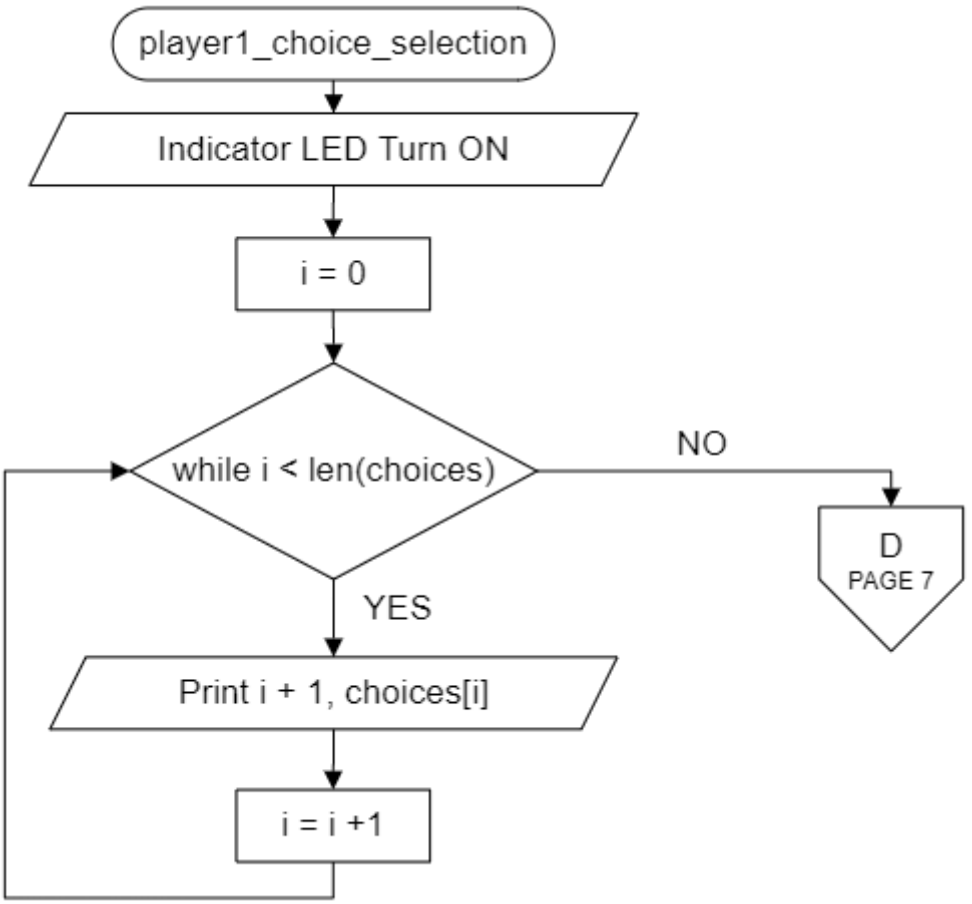
- 5 sets of buttons: Allow the player to choose
- 5 sets of LEDs: To display the player's choice
- 2 sets of LEDs for each player to indicate the winner and score in binary, up to 3 points
- 1 indicator LED
- 1 buzzer to indicate commands
- 1 button to quit the game between rounds

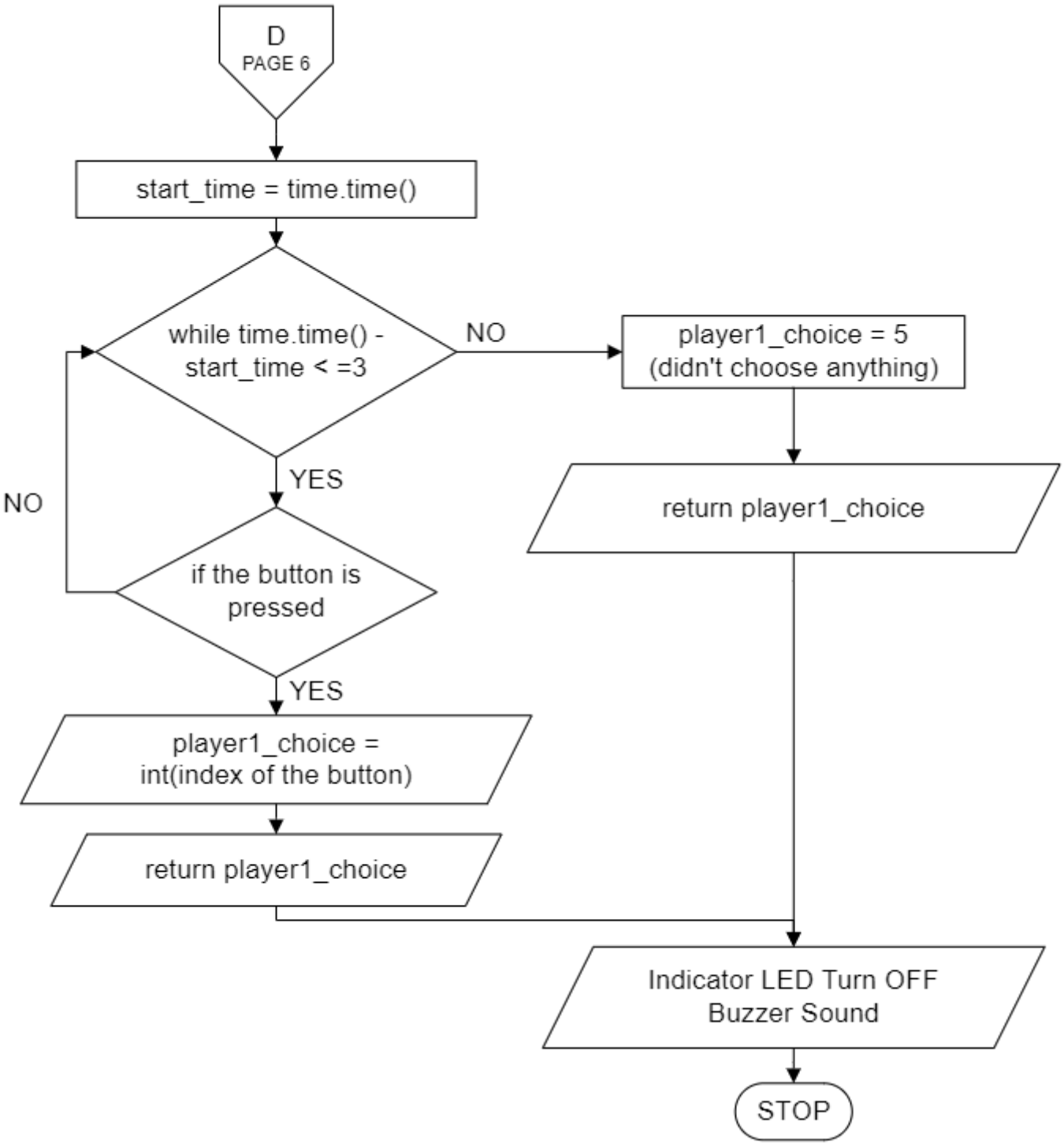
Main Flow mentioning Subprograms:

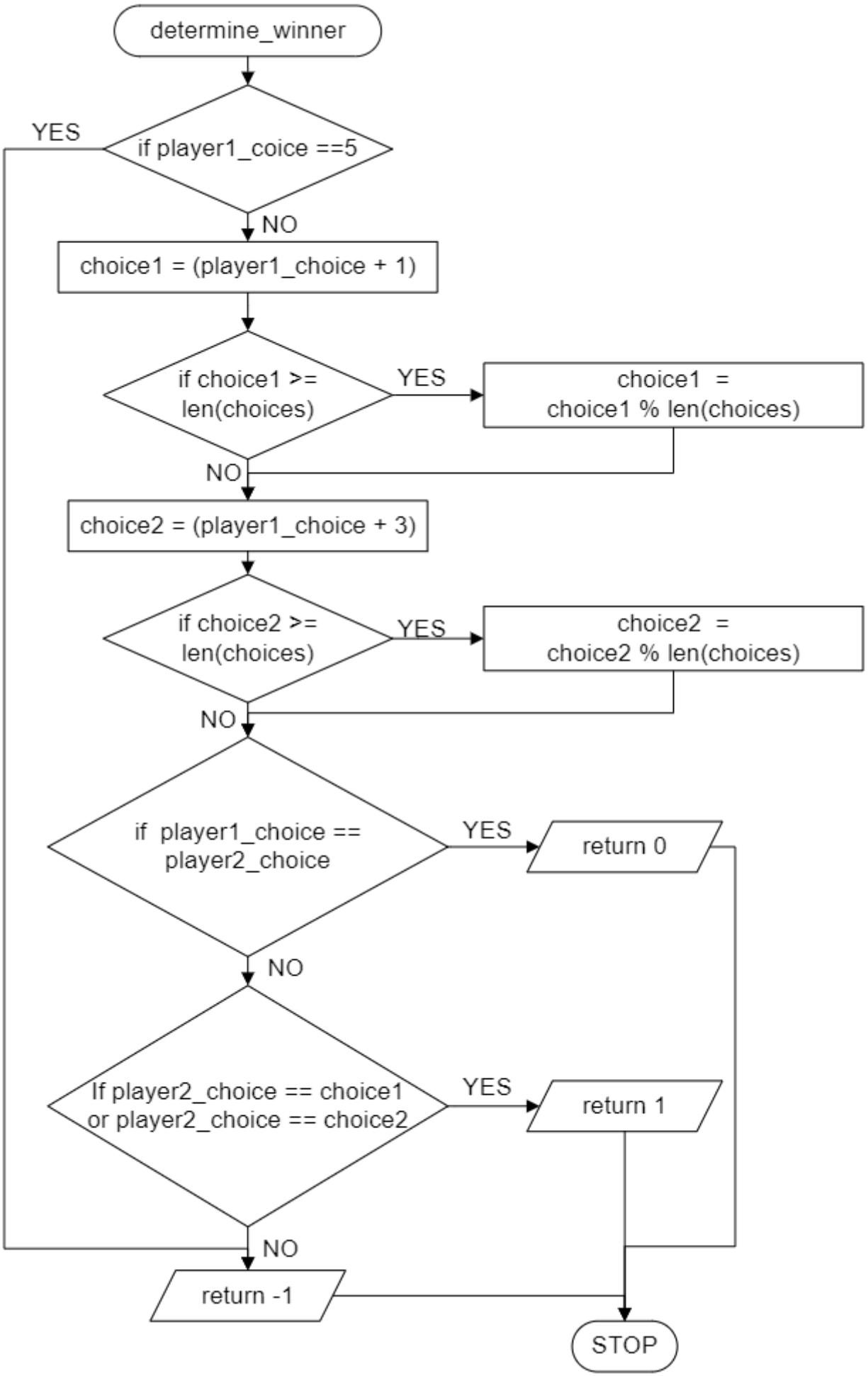


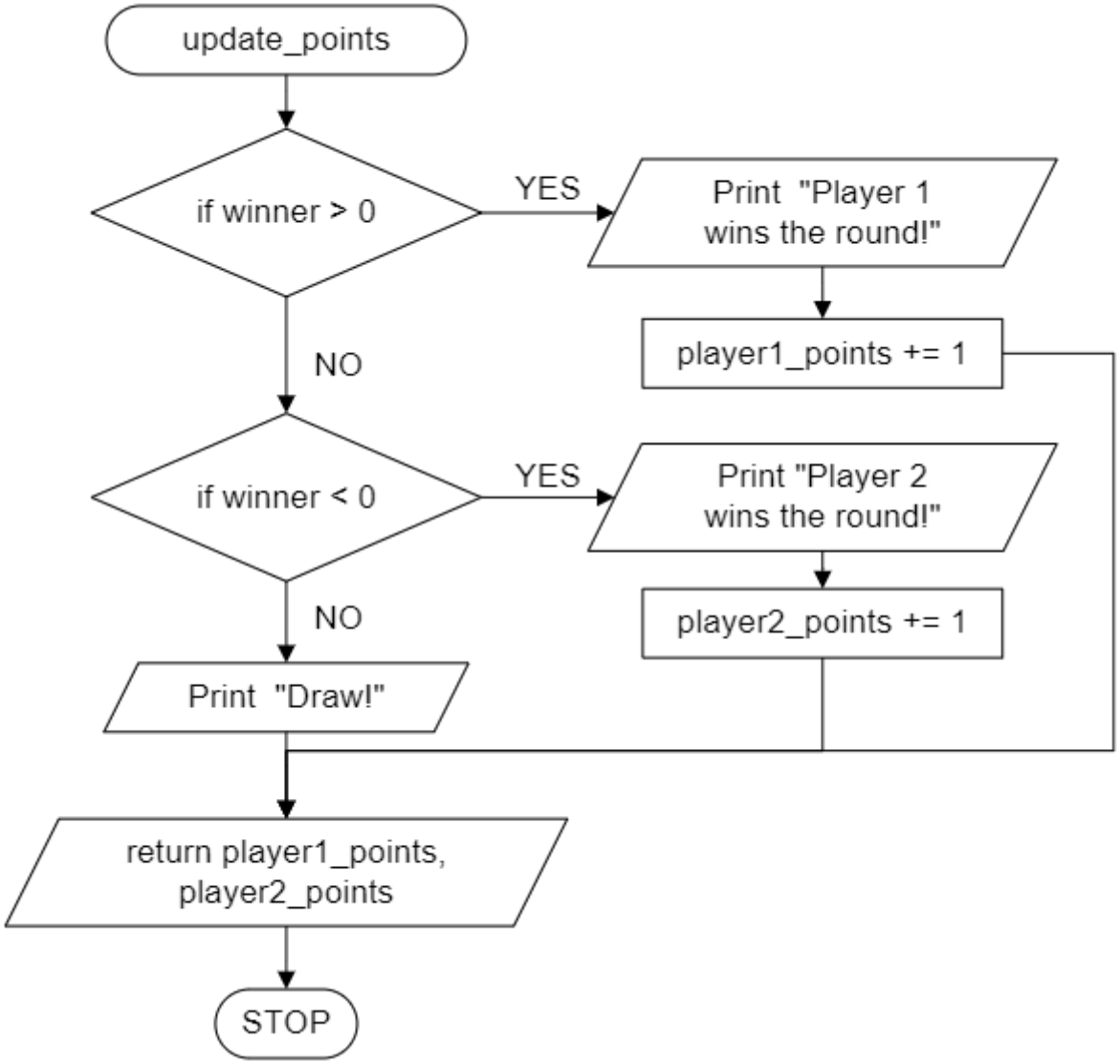

A
PAGE 4
player1_points, player2_points =
update_points(winner,
player1_points, player2_points)
if player1_points > 4 or
player2_points > 4
YES
NO
LED shows both Player
Score
Indicator LED Blinks
with Buzzer
if want to stop the game
(Wait for a sec)
YES
NO
Indicator LED, Buzzer
set OFF
C
PAGE 4
i = i+1
B
PAGE 4

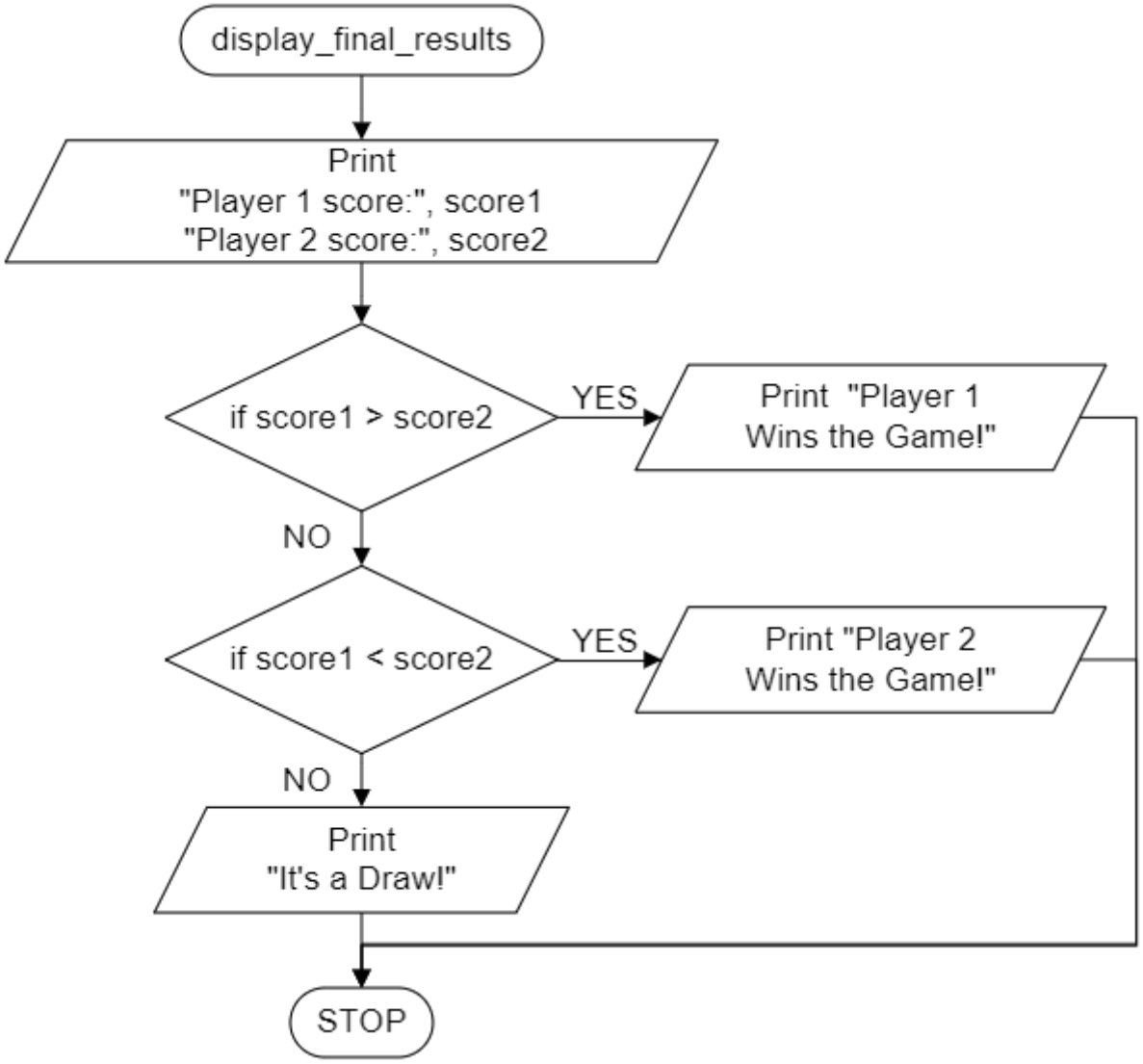
Subprograms:




D
PAGE 6
start_time = time.time()
while time.time() - start_time < =3
NO
player1_choice = 5
(didn't choose anything)
return player1_choice
YES
NO
if the button is pressed
YES
player1_choice = int(index of the button)
return player1_choice
Indicator LED Turn OFF
Buzzer Sound
STOP


determine_winner
YES
if player1_coice ==5
NO
choice1 = (player1_choice + 1)
if choice1 >= len(choices)
YES
choice1 = choice1 % len(choices)
NO
choice2 = (player1_choice + 3)
if choice2 >= len(choices)
YES
choice2 = choice2 % len(choices)
NO
if player1_choice == player2_choice
YES
return 0
NO
If player2_choice == choice1 or player2_choice == choice2
YES
return 1
NO
return -1
STOP


update_points
if winner > 0
YES
Print "Player 1 wins the round!"
player1_points += 1
NO
if winner < 0
YES
Print "Player 2 wins the round!"
player2_points += 1
NO
Print "Draw!"
return player1_points, player2_points
STOP


display_final_results
Print
"Player 1 score:", score1
"Player 2 score:", score2
if score1 > score2
YES
Print "Player 1
Wins the Game!"
NO
if score1 < score2
YES
Print "Player 2
Wins the Game!"
NO
Print
"It's a Draw!"
STOP