

Analysing and Solving Problems – Dice Game Question (Solution Examples)

Your task is to create a simplified game of Dice using three dice. The user will be prompted for and enter three dice throws as numbers between 1 and 6. The program will then check to see if the three dice have the same value (“Three of a kind!”) or if the total is 15 or over. In this simple game, the player loses if they do not get three of a kind or a total over 15 and you should compose a suitable message in this case.

The Content/Questions The task will include questions that will involve:

- 1. Creating an IPO Table for the dice game program.
- 2. Creating a list of variable names used/required.
- 3. Displaying a Pseudocode representation of the program with a program output.
- 4. Creating a flowchart for the above pseudocode.
- 5. Creating a Trace table to find any errors in the program.

1. Creating an IPO Table for the dice game program.

IPO Table

<u>Input</u>	<u>Process</u>	<u>Output</u>
Three dice	Check for “Three of a kind”	Player wins or loses
	Calculate the total sum of the three dice	

2. Creating a list of variable names used/required.

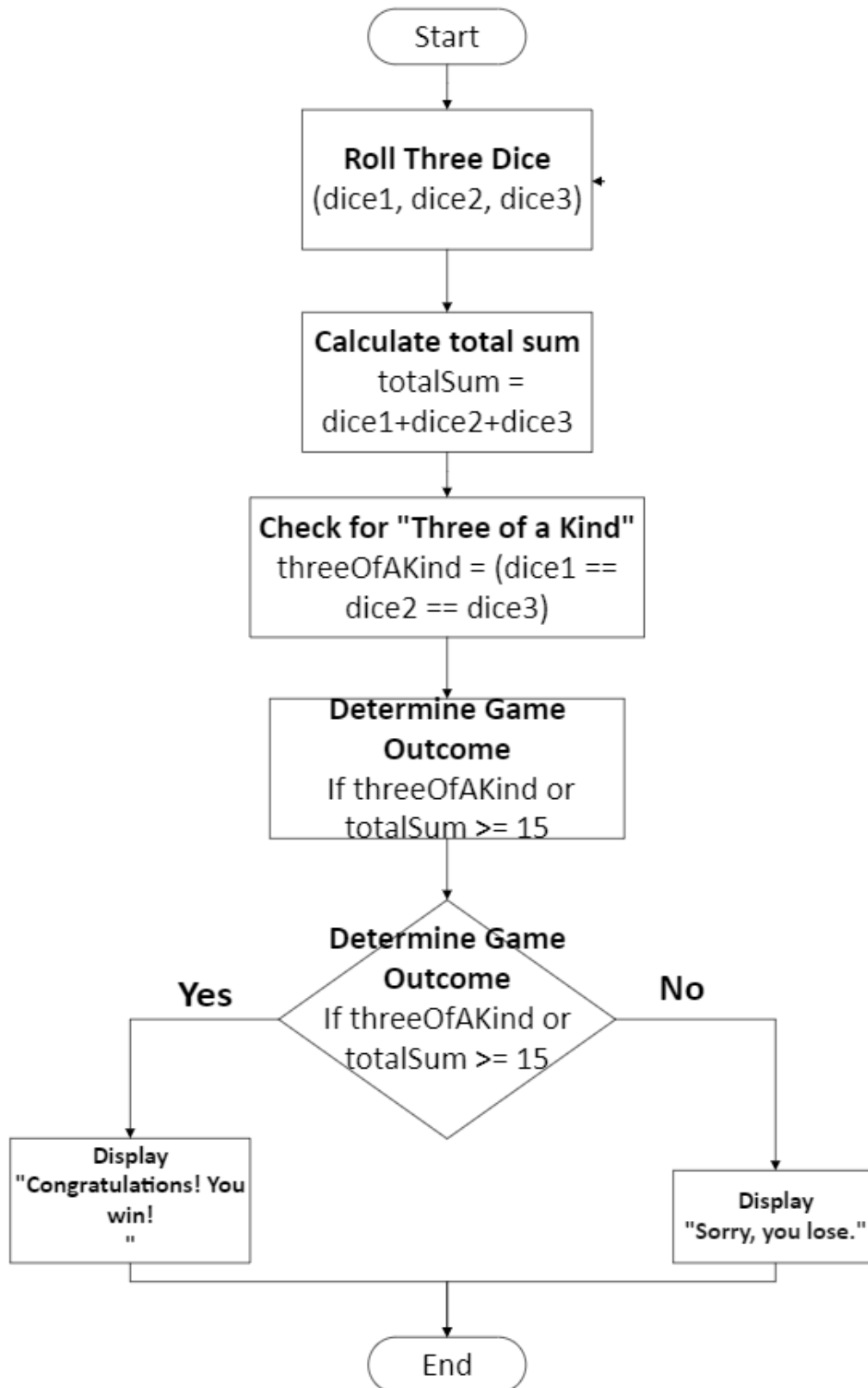
Variable List:

1. **dice1**: Represents the value rolled on the first die.
2. **dice2**: Represents the value rolled on the second die.
3. **dice3**: Represents the value rolled on the third die.
4. **totalSum**: Stores the sum of the three dice values.
5. **threeOfAKind**: A boolean variable indicating whether the dice have the same value (Three of a kind).
6. **playerWins**: A boolean variable indicating whether the player wins the game.

3. Displaying a Pseudocode representation of the program with a program output.

1. Initialize three dice rolls (dice1, dice2, dice3) with random values between 1 and 6.
2. Calculate the total sum: $\text{totalSum} = \text{dice1} + \text{dice2} + \text{dice3}$.
3. Check if the dice have the same value (Three of a kind): If $\text{dice1} == \text{dice2} == \text{dice3}$, set a boolean variable called threeOfAKind to true.
4. Determine the game outcome:
 - If threeOfAKind or $\text{totalSum} \geq 15$:
 - Display "Congratulations! You win!"
 - Else:
 - Display "Sorry, you lose."

4. Creating a flowchart for the above pseudocode.



5. Creating a Trace table to find any errors in the program.

Trace Table:

Step	dice1	dice2	dice3	totalSum	threeOfAKind	Outcome
1	4	2	6	12	false	Sorry, you lose.
2	5	5	5	15	true	Congratulations! You win!
3	3	3	3	9	true	Congratulations! You win!
4	2	4	6	12	false	Sorry, you lose.
5	6	6	6	18	true	Congratulations! You win!
6	1	2	3	6	false	Sorry, you lose.