**IPO chart:**

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| --- | --- | --- |
| Input: | Processing: | Output: |
| User input for whether they want to calculate the number of gallons needed to paint a room (Yes or No).  If the response is "Yes," the program prompts for:  User input for the length of the room (in feet).  User input for the width of the room (in feet).  User input for the height of the room (in feet). | The program defines a function calculateSquareFootage to calculate the square footage of the room based on the provided length, width, and height. It considers the floor, ceiling, and all four walls.  The program uses a while loop to repeatedly prompt the user for input:  If the user's response is "No," the loop ends.  If the user's response is "Yes," the program proceeds to collect room dimension information.  For each "Yes" response, the program calculates the square footage and the number of gallons needed to paint the room. It calculates the number of gallons based on the square footage (1 gallon covers 50 square feet).  If the user provides an invalid response, the program informs the user.  The program repeats this process until the user responds with "No." | For each "Yes" response, the program displays the square footage of the room and the number of gallons needed to paint the room.  If the user provides an invalid response, the program informs the user.  The program ends with a message when the user responds with "No." |

**Code:**

def calculateSquareFootage(length, width, height):

floorCeilingArea = 2 \* length \* width

wall1Area = 2 \* length \* height

wall2Area = 2 \* width \* height

totalArea = floorCeilingArea + wall1Area + wall2Area

return totalArea

while True:

response = input("Do you want to calculate the number of gallons needed to paint a room? (Yes/No): ").strip().lower()

if response == "no":

break

elif response == "yes":

length = float(input("Enter the length of the room (in feet): "))

width = float(input("Enter the width of the room (in feet): "))

height = float(input("Enter the height of the room (in feet): "))

squareFootage = calculateSquareFootage(length, width, height)

gallonsNeeded = squareFootage / 50.0

print(f"Square Footage of the Room: {squareFootage} square feet")

print(f"Number of Gallons Needed: {gallonsNeeded:.2f} gallons\n")

else:

print("Invalid response. Please enter 'Yes' or 'No'.")

print("Program ended.")