Based on the image you uploaded, you need to write a C program that initializes a 3x3 matrix, inserts elements into the array, reads and prints the array using only pointers, and calculates the sum of all diagonal elements.

Here's how you can implement this in C:

c

#include <stdio.h>

int main() {

int matrix[3][3];

int \*ptr = &matrix[0][0];

int sum\_diagonal = 0;

// Input elements in the matrix

printf("Input elements in the matrix:\n");

for(int i = 0; i < 3; i++) {

for(int j = 0; j < 3; j++) {

printf("element - [%d][%d]: ", i, j);

scanf("%d", (ptr + i \* 3 + j));

}

}

// Print the matrix and calculate sum of diagonal elements

printf("The matrix is:\n");

for(int i = 0; i < 3; i++) {

for(int j = 0; j < 3; j++) {

printf("%d ", \*(ptr + i \* 3 + j));

if(i == j || i + j == 2) {

sum\_diagonal += \*(ptr + i \* 3 + j);

}

}

printf("\n");

}

// Print the sum of the diagonal elements

printf("Sum of diagonal elements: %d\n", sum\_diagonal);

return 0;

}

### Explanation:

1. \*Matrix Initialization\*:

- The matrix is a 3x3 array of integers.

- int \*ptr = &matrix[0][0]; is used to point to the first element of the matrix.

2. \*Input\*:

- The program takes input for each element of the matrix using pointers.

3. \*Print the Matrix\*:

- It prints the matrix using pointer arithmetic.

4. \*Diagonal Sum Calculation\*:

- The sum of the diagonal elements is calculated during the printing of the matrix.

5. \*Output\*:

- It prints the matrix and the sum of its diagonal elements.

### Example Output:

If the input is as shown in the image:

Input elements in the matrix:

element - [0][0]: 1

element - [0][1]: 2

element - [0][2]: 3

element - [1][0]: 4

element - [1][1]: 5

element - [1][2]: 6

element - [2][0]: 7

element - [2][1]: 8

element - [2][2]: 9

The matrix is:

1 2 3

4 5 6

7 8 9

Sum of diagonal elements: 25

This program satisfies the requirements specified in the image. It reads the matrix elements, prints them, and calculates the sum of the diagonals using only pointers.