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**COURSE:COMPUTER SCIENCE**

**System programming cat one**

**Question**: Write a C program that reads a string from the user and prints it.

#include <stdio.h>

int main() {

char str[100];

printf("Enter a string: ");

fgets(str, 100, stdin);

printf("You entered: %s", str);

return 0;

}

**Explanation:** **#include <stdio.h>**: This preprocessor directive includes the standard input-output library which contains functions like printf and fgets.

 **int main()**: The main function where the execution of the program begins.

 **char str[100];**: This declares a character array str of size 100 to store the input string.

 **printf("Enter a string: ");**: This prompts the user to enter a string.

 **fgets(str, 100, stdin);**: This function reads a string from the standard input (stdin) and stores it in str. It reads up to 99 characters (leaving space for the null terminator) or until a newline character is encountered.

 **printf("You entered: %s", str);**: This prints the string that was entered by the user.

 **return 0;**: This statement terminates the main function and returns 0 to the calling process, indicating that the program ended successfully.

**2. Read and Sum Two Integers**

**Question**: Write a C program that reads two integers from the user and prints their sum.

#include <stdio.h>

int main() {

int a, b, sum;

printf("Enter two integers: ");

scanf("%d %d", &a, &b);

sum = a + b;

printf("Sum: %d\n", sum);

return 0;

}

**Explanation:** **#include <stdio.h>**: This preprocessor directive includes the standard input-output library which contains functions like printf and scanf.

 **int main()**: The main function where the execution of the program begins.

 **int a, b, sum;**: This declares three integer variables a, b, and sum.

 **printf("Enter two integers: ");**: This prompts the user to enter two integers.

 **scanf("%d %d", &a, &b);**: This function reads two integers from the standard input (stdin) and stores them in the variables a and b.

 **sum = a + b;**: This calculates the sum of the two integers and stores the result in the variable sum.

 **printf("Sum: %d\n", sum);**: This prints the sum of the two integers.

 **return 0;**: This statement terminates the main function and returns 0 to the calling process, indicating that the program ended successfully.

**Question 14**

**Write a program to read two integers from the user and print their sum.**

#include <stdio.h>

int main() {

int num1, num2;

printf("Enter two integers: ");

scanf("%d %d", &num1, &num2);

printf("Sum: %d\n", num1 + num2);

return 0;

}

**Explanation:** **#include <stdio.h>**: This preprocessor directive includes the standard input-output library which contains functions like printf and scanf.

 **int main()**: The main function where the execution of the program begins.

 **int num1, num2;**: This declares two integer variables num1 and num2.

 **printf("Enter two integers: ");**: This prompts the user to enter two integers.

 **scanf("%d %d", &num1, &num2);**: This function reads two integers from the standard input (stdin) and stores them in the variables num1 and num2.

 **printf("Sum: %d\n", num1 + num2);**: This prints the sum of the two integers.

 **return 0;**: This statement terminates the main function and returns 0 to the calling process, indicating that the program ended successfully.

**Question 16**

**Write a program to read an integer array of size 5 from the user and print the elements.**

#include <stdio.h>

int main() {

int arr[5];

printf("Enter 5 integers: ");

for(int i = 0; i < 5; i++) {

scanf("%d", &arr[i]);

}

printf("You entered: ");

for(int i = 0; i < 5; i++) {

printf("%d ", arr[i]);

}

printf("\n");

return 0;

}

**Explanation:** **#include <stdio.h>**: This preprocessor directive includes the standard input-output library which contains functions like printf and scanf.

 **int main()**: The main function where the execution of the program begins.

 **int arr[5];**: This declares an array arr of size 5 to store the integers.

 **printf("Enter 5 integers: ");**: This prompts the user to enter 5 integers.

 **for(int i = 0; i < 5; i++) { scanf("%d", &arr[i]); }**: This loop iterates 5 times, reading an integer from the user during each iteration and storing it in the corresponding element of the array arr.

 **printf("You entered: ");**: This prints a message indicating the beginning of the output of the entered integers.

 **for(int i = 0; i < 5; i++) { printf("%d ", arr[i]); }**: This loop iterates 5 times, printing each integer in the array arr followed by a space.

 **printf("\n");**: This prints a newline character to ensure the output is properly formatted.

 **return 0;**: This statement terminates the main function and returns 0 to the calling process, indicating that the program ended successfully.

**Question 22**

**Write a program that reads an integer from the user and checks if it is even or odd.**

**Solution:**

#include <stdio.h>

int main() {

int num;

printf("Enter an integer: ");

scanf("%d", &num);

if (num % 2 == 0) {

printf("%d is even\n", num);

} else {

printf("%d is odd\n", num);

}

return 0;

}

**Explanation:** **#include <stdio.h>**: This preprocessor directive includes the standard input-output library which contains functions like printf and scanf.

 **int main()**: The main function where the execution of the program begins.

 **int num;**: This declares an integer variable num.

 **printf("Enter an integer: ");**: This prompts the user to enter an integer.

 **scanf("%d", &num);**: This function reads an integer from the standard input (stdin) and stores it in the variable num.

 **if (num % 2 == 0) { printf("%d is even\n", num); }**: This condition checks if the integer is divisible by 2 (i.e., if it is even). If true, it prints that the number is even.

 **else { printf("%d is odd\n", num); }**: If the condition in the if statement is false, this else block executes and prints that the number is odd.

 **return 0;**: This statement terminates the main function and returns 0 to the calling process, indicating that the program ended successfully.