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Date	Dec 13 2024	Assignment	2
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Topic : C Programming -Functions - Solutions

1. Write a function `int add(int a, int b)` that takes two integers as input and returns their sum. Call this function from `main()` and print the result.
2. Write a function `void checkEvenOdd(int num)` that takes an integer as input and prints whether the number is even or odd.
3. Write a function `int max(int a, int b)` that takes two integers and returns the larger of the two.

```

1  #include <stdio.h>
2
3  // Function to add two integers
4  int add(int a, int b) {
5      return a + b;
6  }
7
8  // Function to check if a number is even or odd
9  void checkEvenOdd(int num) {
10     if (num % 2 == 0) {
11         printf("%d is even.\n", num);
12     } else {
13         printf("%d is odd.\n", num);
14     }
15 }
16
17 // Function to find the maximum of two integers
18 int max(int a, int b) {
19     return (a > b) ? a : b;
20 }
21
22 // Main function
23 int main() {
24     int num1, num2, result;
25
26     // Testing the add function
27     printf("Enter two numbers to add: ");
28     scanf("%d %d", &num1, &num2);
29     result = add(num1, num2);
30     printf("Sum: %d\n", result);
31
32     // Testing the checkEvenOdd function
33     printf("Enter a number to check even or odd: ");
34     scanf("%d", &num1);
35     checkEvenOdd(num1);
36
37     // Testing the max function
38     printf("Enter two numbers to find the maximum: ");
39     scanf("%d %d", &num1, &num2);
40     result = max(num1, num2);
41     printf("Maximum: %d\n", result);
42
43     return 0;
44 }
45

```

4. Write a function `float calculate(char operator, float a, float b)` that performs addition, subtraction, multiplication, or division based on the operator provided. Return the result and print it in the `main()` function.

```

main.c
1 #include <stdio.h>
2 float calculate(char operator, float a, float b) {
3     if (operator == '+') {
4         return a + b;
5     } else if (operator == '-') {
6         return a - b;
7     } else if (operator == '*') {
8         return a * b;
9     } else if (operator == '/') {
10        if (b != 0) {
11            return a / b;
12        } else {
13            printf("Error: Division by zero is not allowed.\n");
14            return 0.0;
15        }
16    } else {
17        printf("Error: Invalid operator.\n");
18        return 0.0;
19    }
20 }
21 int main() {
22     char operator;
23     float num1, num2, result;
24
25     printf("Enter an operator (+, -, *, /): ");
26     scanf("%c", &operator);
27
28     printf("Enter two numbers: ");
29     scanf("%f %f", &num1, &num2);
30
31     result = calculate(operator, num1, num2);
32     printf("Result: %.2f\n", result);
33
34     return 0;
35 }

```

Output

```

Enter an operator (+, -, *, /): *
Enter two numbers: 2
4
Result: 8.00

=== Code Execution Successful ===

```

```

main.c
1 #include <stdio.h>
2 float calculate(char operator, float a, float b) {
3     if (operator == '+') {
4         return a + b;
5     } else if (operator == '-') {
6         return a - b;
7     } else if (operator == '*') {
8         return a * b;
9     } else if (operator == '/') {
10        if (b != 0) {
11            return a / b;
12        } else {
13            printf("Error: Division by zero is not allowed.\n");
14            return 0.0;
15        }
16    } else {
17        printf("Error: Invalid operator.\n");
18        return 0.0;
19    }
20 }
21 int main() {
22     char operator;
23     float num1, num2, result;
24
25     printf("Enter an operator (+, -, *, /): ");
26     scanf("%c", &operator);
27
28     printf("Enter two numbers: ");
29     scanf("%f %f", &num1, &num2);
30
31     result = calculate(operator, num1, num2);
32     printf("Result: %.2f\n", result);
33
34     return 0;
35 }

```

Output

```

Enter an operator (+, -, *, /): -
Enter two numbers: 2 3
Result: -1.00

=== Code Execution Successful ===

```

- Write a function `int factorial(int n)` that calculates and returns the factorial of a number. Use this function in `main()` to compute the factorial of a user-input number.
- Write a function `int power(int base, int exp)` that calculates the result of raising a base to an exponent using a loop. Use this function to calculate 2^5 .
- Write a function `void greet()` that takes no arguments and prints a greeting message like "Hello, welcome to C programming!".
- Write a function `int isPrime(int n)` that checks if a number is prime. It should return `1` if the number is prime and `0` otherwise.

9. Write a function `int sumOfDigits(int num)` that takes an integer as input and returns the sum of its digits. For example, if the input is `123`, the output should be `6`.
10. Write a function `int square(int n)` that takes an integer as input and returns its square. Use this function in `main()` to calculate and print the square of a user-input number.

Solutions 5-10

```
1  #include <stdio.h>
2
3  // Function to calculate the factorial of a number
4  int factorial(int n) {
5      int fact = 1;
6      for (int i = 1; i <= n; i++) {
7          fact *= i;
8      }
9      return fact;
10 }
11
12 // Function to calculate power using a loop
13 int power(int base, int exp) {
14     int result = 1;
15     for (int i = 0; i < exp; i++) {
16         result *= base;
17     }
18     return result;
19 }
20
21 // Function to print a greeting message
22 void greet() {
23     printf("Hello, welcome to C programming!\n");
24 }
25
26 // Function to check if a number is prime
27 int isPrime(int n) {
28     if (n <= 1) return 0;
29     for (int i = 2; i * i <= n; i++) {
30         if (n % i == 0) return 0;
31     }
32     return 1;
33 }
34
35 // Function to calculate the sum of digits of a number
36 int sumOfDigits(int num) {
37     int sum = 0;
38     while (num != 0) {
39         sum += num % 10;
40         num /= 10;
41     }
42     return sum;
43 }
44
45 // Function to calculate the square of a number
46 int square(int n) {
47     return n * n;
48 }
49
```

```

49
50 // Main function
51 int main() {
52     int num, result;
53
54     // Testing the factorial function
55     printf("Enter a number to calculate its factorial: ");
56     scanf("%d", &num);
57     result = factorial(num);
58     printf("Factorial: %d\n", result);
59
60     // Testing the power function
61     printf("2^5 = %d\n", power(2, 5));
62
63     // Testing the greet function
64     greet();
65
66     // Testing the isPrime function
67     printf("Enter a number to check if it's prime: ");
68     scanf("%d", &num);
69     if (isPrime(num)) {
70         printf("%d is a prime number.\n", num);
71     } else {
72         printf("%d is not a prime number.\n", num);
73     }
74
75     // Testing the sumOfDigits function
76     printf("Enter a number to calculate the sum of its digits: ");
77     scanf("%d", &num);
78     printf("Sum of digits: %d\n", sumOfDigits(num));
79
80     // Testing the square function
81     printf("Enter a number to calculate its square: ");
82     scanf("%d", &num);
83     printf("Square: %d\n", square(num));
84
85     return 0;
86 }
87

```

END