Introduction to Basic C Programming and Assignment Questions

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Introduction to Basic C Programming

C is one of the most fundamental and widely used programming languages. It is known as a **procedural language** because programs are written as a series of step-by-step instructions.

Learning C helps you understand:

- **How programs interact with hardware** — C is close to low-level programming.

- **Core programming logic** — loops, conditions, functions.

- **Memory management** — variables, pointers.

Structure of a C Program

A typical C program has:

- **Preprocessor directives** — e.g., `#include <stdio.h>`

- **main() function** — starting point of execution.

- **Statements and expressions** — instructions to the computer.

- **Return statement** — sends an exit code back to the OS.

Basic Terminology

- **Variable:** Named storage in memory. Example: `int age = 20;`

- **Data Types:**

    - `int` — integers (whole numbers)
    - `float` — decimal numbers
    - `char` — single characters

- **Operators:**

    - Arithmetic: `+ - * / %`
    - Relational: `> < == !=`
    - Logical: `&& || !`

- **Input/Output Functions:**
  - `printf()` — prints to the screen
  - `scanf()` — takes input from the user

- **Control Structures:**
  - Decision making: `if`, `if-else`, `switch`
  - Loops: `for`, `while`, `do-while`

- **Functions:** Blocks of reusable code.

Sample C Programs

Before starting the assignment, study these examples:

Example 1: Hello World Program

```c
#include <stdio.h>

int main() {
    printf("Hello, World!\n");
    return 0;
}
```

This program demonstrates the simplest C output.

Example 2: Adding Two Numbers

```c
#include <stdio.h>

int main() {
    int a, b, sum;
    printf("Enter two numbers: ");
    scanf("%d %d", &a, &b);
    sum = a + b;
    printf("Sum = %d\n", sum);
    return 0;
}
```

Example 3: Using if-else for Decision Making

```c
#include <stdio.h>

int main() {
    int num;
    printf("Enter a number: ");
    scanf("%d", &num);
```

```c
    if(num % 2 == 0)
        printf("Even number\n");
    else
        printf("Odd number\n");
    return 0;
}
```

Example 4: Simple Loop

```c
#include <stdio.h>

int main() {
    int i;
    for(i = 1; i <= 5; i++) {
        printf("Count: %d\n", i);
    }
    return 0;
}
```

Assignment Questions with Hints

Now that you know the basics, complete the following programs:

1. Add two numbers. *Hint: Use + operator.*

2. Subtract two numbers. *Hint: Use - operator.*

3. Multiply two numbers. *Hint: Use * operator.*

4. Divide two numbers. *Hint: Use / operator with float.*

5. Perform all four operations. *Hint: +, -, *, /.*

6. Convert hours into minutes. *Hint: minutes = hours * 60.*

7. Convert minutes into hours. *Hint: hours = minutes / 60.*

8. Convert dollars into Rs. (1$ = 48 Rs). *Hint: rupees = dollars * 48.*

9. Convert Rs. into dollars. *Hint: dollars = rupees / 48.*

10. Convert dollars into pounds (1$=48Rs, 1 pound=70Rs). *Hint: Convert via Rs.*

11. Convert grams into kg. *Hint: kg = grams / 1000.*

12. Convert kg into grams. *Hint: grams = kg * 1000.*

13. Convert bytes into KB, MB, GB. *Hint: Divide by 1024.*

14. Celsius to Fahrenheit. *Hint: F = (9/5) * C + 32.*

15. Fahrenheit to Celsius. *Hint: C = (5/9) * (F - 32).*

16. Calculate interest. *Hint: I = P * R * N / 100.*

17. Area & perimeter of a square. *Hint: A = L², P = 4L.*

18. Area & perimeter of a rectangle. *Hint: A = L*B, P = 2(L+B).*

19. Area of a circle. *Hint: A = (22/7) * R².*

20. Area of a triangle. *Hint: A = (H * L) / 2.*

21. Net salary (Allowance=10%, Deduction=3%). *Hint: net = gross + allowance - deduction.*

22. Net sales with 10% discount. *Hint: net = gross - (0.10 * gross).*

23. Average & total of three subjects. *Hint: total = s1+s2+s3; avg=total/3.*

24. Swap two values. *Hint: Use a temporary variable.*