The Tower of Magical Type Conversions

Background:

In the mystical World of CodeCraft, alchemists use various magical ingredients to create powerful spells. Each ingredient has a unique data type, and mixing them requires careful handling of type conversions.

Your task is to implement a C program that demonstrates implicit and explicit type conversions while performing magical operations on these ingredients.

Requirements:

1. 1. Define the following magical ingredients using different data types:

- - Dwarf Sand (char)
- - Elf Dust (short int)
- - Giant Bone (int)
- - Orc Blood (unsigned int)
- - Dragon Scale (long int)
- - Troll Slime (unsigned long int)
- - Fairy Dust (float)
- - Magical Water (double)

Step 2: Implicit Type Conversions (Automatic Promotion)

When performing arithmetic operations, C automatically converts smaller data types to larger ones. Your program should demonstrate these conversions:

Magical Mixtures (Implicit Conversions):

- - Dwarf Sand (char) + Giant Bone (int) → char is converted to int.
- - Elf Dust (short int) + Giant Bone (int) → short int is converted to int.
- - Orc Blood (unsigned int) - Giant Bone (int) → int is converted to unsigned int.
- - Dragon Scale (long int) × Orc Blood (unsigned int) → unsigned int is converted to long int.
- - Fairy Dust (float) / Troll Slime (unsigned long int) → unsigned long int is converted to float.
- - Magical Water (double) × Fairy Dust (float) → float is converted to double.

Step 3: Explicit Type Conversions (Manual Casting)

In some cases, we must force the conversion manually using type casting. Your program should demonstrate these conversions:

Example:

int stone = (int)fairy_dust;

Magical Transformations (Explicit Casting):

- Fairy Dust (float) → Stone (int)

  - float is converted to int, removing decimal points.

- Magical Water (double) → Scroll (char)
  - double is converted to char, keeping only the lowest byte of data. (it takes the integer part)

- Giant Bone (int) → Talisman (unsigned int)
  -int is converted to unsigned int, ensuring non-negative values.

```
// Step 1: Define magical ingredients
char dwarf_sand = 'A';          // Represents Dwarf Sand
short int elf_dust = 25;        // Represents Elf Dust
int giant_bone = 100;           // Represents Giant Bone
unsigned int orc_blood = 200;   // Represents Orc Blood
long int dragon_scale = 1000;   // Represents Dragon Scale
unsigned long int troll_slime = 5000; // Represents Troll Slime
float fairy_dust = 2.5f;        // Represents Fairy Dust
double magical_water = 65.75;   // Represents Magical Water
```

```
Implicit Conversions:
Mix1 (Dwarf Sand + Giant Bone) [char to int]: 165
Mix2 (Elf Dust + Giant Bone) [short int to int]: 125
Mix3 (Orc Blood - Giant Bone) [int to unsigned int]: 100
Mix4 (Dragon Scale * Orc Blood) [unsigned int to long int]: 200000
Mix5 (Fairy Dust / Troll Slime) [unsigned long int to float]: 0.0005
Mix6 (Magical Water * Fairy Dust) [float to double]: 164.37500000

Explicit Conversions:
Stone (Fairy Dust to int): 2
Scroll (Magical Water to char): A
Talisman (Giant Bone to unsigned int): 100
```