Week 2: String, Overflow and Type Casting

Overview

Welcome to your second week of learning C programming!
This week, we will cover the basics of writing and running a simple C program. By the end of this tutorial, you will:

- Overflow, Underflow
- Handling String with <string.h>
- Type Casting/Conversion

** 1. Overflow (10 min)**

You should always be careful of the range of values

Example: Overflow!

```c
#include<stdio.h>
#define MAX 214783647
#define MIN -2147483648
int main(){

    printf("max value: %d\n",MAX);
    printf("min value: %d\n",MIN);

    printf("max +1 value: %d\n",MAX+1);
    printf("min -1 value: %d\n",MIN-1);

}
```

PROF

Exercise 1 (5 min):

Check the maximum and minimum values of other data types and see what happens when you go beyond the range of values

---

2. String (15 min)

There are lots of functions in stirng.h that we can use when we deal with a string.

Functions in <string.h>

Operation Name	FUNCTION
strlen	Find length of string
strwr	Converts a string to lowercase
strupr	Converts a string to uppercase
strcat	Appends one string at the end of another
strncat	Appends first n characters of a string at the end of another
strcpy	Copies a string to another
strncpy	Copies first n characters of two strings
strcmp	Compare two strings
strncmp	Compares first n characters of two strings
strcmpi	Compares two strings without regard to case ('i' denotes that this function ignores case)
stricmp	Compares two strings without regard to case (identical to strcmpi)
strnicmp	Compares first n characters of two strings without regard to case
strdup	Duplicates a string
strchr	Finds first occurrence of a given character in a string
strrchr	Finds last occurrence of a given character in a string
strstr	Finds first occurrence of a given string in another string
strset	Sets all characters of string to a given character
strnset	Sets first n characters of a string to a given character
strrev	Reverses string

Example: Using Variables

```
#include <stdio.h>
#include <string.h>
int main() {
    char hello[20]="hello";
    char world[20]="world";
    printf("%s%s\n",hello,world);
    strcat(hello,world);
    printf("%s and length of hello string is:
%d\n",hello,strlen(hello));
    return 0;
}
```

PROF

Exercise 2 (10 min):

Create a program that introduce yourself by getting input of your last name, first name and age.
*Please get input of your last, middle, first name seperately and print if by putting your name in one string variable.
(Output Ex. Hello, my name is JinseSeo and I am 24 years old. Nice to meet you!)

3. Typecasintg (20 min)

You can converse data type

Example: User Input

```c
#include<stdio.h>

int main(){

    int a=100;
    int b=3;
    float c=3.33;
    printf("%d and %f \n", a/b, (float)a/b);

    printf("%d and %f\n", (int)c, c);

    c=a/b;
    a=3.33;
    printf("%f and %d\n", c, a);
    return 0;
}
```

Exercise 3 (10 min):

Write a program that ask score of Math, English, Korean and print the average score to the second decimal place.

Example Output:

Your average score is 54.25

PROF

**4. Assignment (10 min) a personal information output program:

Inspired by previous assignments, let's create a structured task:

Task: Write a C program that a personal information output program. Your program should:

1. Ask the user for their last name, first name, age, gender (M/F), height (in cm) and weight (in kg).
2. Askt the user for their scores of Math, English, Korean and Art.
3. Print all this information using proper formatting.

BMI = Kg/m^2

Example Output:

```
You are JinseSeo, 24 years old and your gender is "M"
Your BMI is 21.749418
Your average score is 54.25
```

Summary & Wrap-Up (10 min)

This week, we covered:

- Writing a simple C program
- Overflow, Underflow
- Utilizing String functions
- Type casting/conversion

Next Week: Basic C Programming - loops

Happy coding! 🚀