BUPT SE ICP Quiz -- Unit 03 Operators and Expressions
Information Coding

If you are using LLM to help you in this quiz, you MUST write down 1) the name of the LLM and 2) the PROMPTS. Otherwise, you will get zero score if the instructor finds that you are using LLM.
You may use the following table as a template, putting the table down to the title of each question.

Name of LLM	Prompts
No LLM Used	

1. The sizeof operator returns the __size of memory (Bytes)__ of the variable.
2. The escape character "\n" represents ____line feed____, and its ASCII code is ____10____ (use decimal number)
3. [F] T/F: Arithmetic operators only apply to numeric types.
4. [T] T/F: Compound assignment operators change two variables.
5. [F] T/F: Unicode and UTF-8 are all Character Sets.
6. A UTF-8 encoded character may occupy up to ____1/2/3/4____ bytes.
7. Write a program that takes two integer inputs and outputs the sum, difference, product, quotient and remainder. Use the +, -, *, / and % operators.

```c
#include<stdio.h>
int main(void){
   int num1, num2;
   int sum, diff, prod, quot, remainder;
   printf ("Please input 2 numbers\n\a");
   scanf ("%d %d", &num1, &num2);
   sum = num1 + num2;
   diff = num1 - num2;
   prod = num1 * num2;
   quot = num1/num2;
   remainder = num1 % num2;
   printf("The sum is %d\n", sum);
   printf("The diff is %d\n", diff);
   printf("The product is %d\n", prod);
   printf("The quotient is %d\n", quot);
   printf("The remainder is %d\n", remainder);
   return 0;
}
```

8. Write a program to input a year and check if it is a leap year using logical operators && and ||.

```
#include <stdio.h>
int main() {
   int year;
   printf("Enter a year: ");
   scanf("%d", &year);

   if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
      printf("%d is a leap year.\n", year);}
   else {
      printf("%d is not a leap year.\n", year);}
   return 0;
}
```

9. Write a program to input 5 numbers and find the largest and smallest using conditional and relational operators.

```
#include <stdio.h>
int main() {
   int nums[5];
   int largest, smallest;
   printf("Enter 5 numbers:\n");
   scanf("%d", &nums[i]);
   largest = nums[0];
   smallest = nums[0];
   for (i = 1; i < 5; i++) {
      if (nums[i] > largest) {
         largest = nums[i];
      }
      if (nums[i] < smallest) {
      smallest = nums[i];
      }
   }
   printf("The largest number is%d\n", largest);
   printf("The smallest number is: %d\n", smallest);
   return 0;
}
```

//I tried NOT to use array to solve this question, BUT that makes the code hard to read and more like shit code...

10. Write a program to separate and print the high and low bytes of an integer in hexadecimal format. The program should:

    1) Declare an integer variable and initialize it to any 4-byte value.
    2) To extract the high 2 bytes, right shift the integer 16 bits and print the result in hexadecimal format using printf("%X", high_bytes).
    3) To extract the low 2 bytes, mask the integer using the bitwise AND operator with 0x0000FFFF and print the result in hexadecimal format using printf("%X", low_bytes).
    4) Print the original integer value in hexadecimal format for comparison.

Example:

If integer x = 0x12345678;

High bytes: x >> 16 = 0x00001234
Low bytes: x & 0xFFFF = 0x00005678

Printf statements would be:

printf("%X\n", x); // prints 12345678
printf("%X\n", x>>16); // prints 1234
printf("%X\n", x&0xFFFF); // prints 5678

```c
#include <stdio.h>
int main() {
   unsigned int x;
   printf("Enter a Hex Number: 0x");
   scanf("%x", &x);
   printf("%X\n", x);
   printf("%X\n", x >> 16);
   printf("%X\n", x & 0xFFFF);
   return 0;
}
```