Problem 1: Simple Greeting Program (30%)

Problem Statement: Write a Python program that asks the user for their name and age, then prints a message "Hello, *name*! You are *age* months old".

Hints:

- Use standard input and output handling.

Example Input:

> *Enter your name:* Alice
>
> *Enter your age in year:* 20

Example Output:

> Hello, Alice! You are 240 months old.

Problem 2: Factorial Calculation (30%)

Problem Statement: Write a Python program that calculates the factorial of a given number n using loops.

Hints:

- Implement the definition of factorial: $n! = n \times (n-1) \times ... \times 1$, with $0! = 1$
- n is a non-negative integer.

Example Input:

> *Enter a non-negative integer:* 5

Example Output:

> The factorial of 5 is 120

Problem 3: The Shape Problem You Are All Waiting For (20%)

Problem Statement: Write a Python program that asks the user for an odd integer n (greater than or equal to 7). The program should print a **hollow diamond** shape made of asterisks (*) inside a $n \times n$ **solid square** of asterisks. The diamond should be centered within the square.

Example Input:

> *Enter an odd number greater than or equal to 7:* 9

Example Output:

```
*   *   *   *   *   *   *   *   *
*   *   *   *       *   *   *   *
*   *   *               *   *   *
*   *                       *   *
*                               *
*   *                       *   *
*   *   *               *   *   *
*   *   *   *       *   *   *   *
*   *   *   *   *   *   *   *   *
```

Problem 4: Number Pattern Puzzle (20%)

Problem Statement: Write a Python program that asks the user for an integer input n. The program should then do the following:

1. Print the numbers from 1 to n in a single line.

2. For each number i in the range 1 to n:

   o   If i is even, print the string "even" instead of the number.

   o   If i is odd, print the number itself.

   o   If i is divisible by 7 or 11, print "FizzBuzz" instead of the number or "even".

   o   If i is less than or equal to 0, print "Invalid input!" and end the program immediately.

Hints:

- The priority of "FizzBuzz" should be higher than "even" and "odd".

- Use *print("Something to print", end=" ")* to print a space after the output instead of line break.

Example Input:

> *Enter a number:* 13

Example Output:

> 1 even 3 even 5 even Fizzbuzz even 9 even Fizzbuzz even 13