# GPA Calculator: Code Explanation

## Introduction

This document provides a detailed breakdown of a Python program designed to calculate the Grade Point Average (GPA)

based on user input. The program takes letter grades, assigns corresponding grade points, calculates the GPA,

and allows the user to continue entering grades until they choose to exit.

## Code Breakdown

### License Notice

The program begins with a license notice under the Hasan Open License (HOL). This notice states that any copied

or modified version of the code must include a reference to the original source.

### Initialization of Variables

```python
sentry = "y"
count = 0
gpa = 0
amount = 0
```

- `sentry`: A control variable that determines whether the program continues or stops.
- `count`: Tracks the number of valid grades entered.
- `gpa`: Stores the total grade points accumulated.
- `amount`: Counts the total number of grades entered, including invalid ones.

### Program Flow

1. The program displays a welcome message and initializes the required variables.
2. It enters a `while` loop that continues running as long as `sentry` is "y" (user wants to continue).
3. Inside the loop:
   - The user is prompted to enter a letter grade.

- The input is converted to lowercase for uniformity.
- The program updates `amount` by 1, indicating an attempt to input a grade.
- A series of conditional checks (`if-elif`) assigns numerical values to valid grades:
  - "A" = 4 points
  - "B" = 3 points
  - "C" = 2 points
  - "D" = 1 point
  - "F" = 0 points
  - If the grade is invalid, an error message is displayed, and the program prompts the user to restart.

**GPA Calculation**

```python
gpafinal = gpa / count
```

- The GPA is computed as the sum of grade points divided by the number of valid grades.
- The calculated GPA is displayed to the user.
- The user is asked if they want to continue (`y` for yes, `n` for no).
- If "y" is entered, the loop continues; otherwise, the program terminates.

**Exiting the Program**

The program ends with:

```python
input("Press Enter to Exit")
```

This ensures the user can read the final output before the program closes.

## Example Run

```
Welcome to the GPA Calculator
--------------------

What is your letter grade? A
You have entered 1 grade.
```

Your GPA is 4.0

Do you want to continue (y or n)? y

---

What is your letter grade? B

You have entered 2 grades.

Your GPA is 3.5

Do you want to continue (y or n)? n

Press Enter to Exit

```

## Possible Improvements

1. **Input Validation:** Instead of restarting the program for invalid inputs, loop until a valid grade is entered.
2. **Error Handling:** Add exception handling to avoid division by zero if no valid grades are entered.
3. **Better User Experience:** Improve the user interface with clearer prompts and formatted output.

This concludes the explanation of the GPA Calculator program.
```