1. **By Hand**

10/15/1999 -10/25/1999

25-15=10 days

10/23/1999 – 12/1/1999

8+30+1 = 39 days

10/21/1999-3/4/2004

72+366+365+365+365+64 = 1597 days

2. **Approach**

To find the number of days between two dates in the same month we will take the ending date and subtract the beginning date to find the total number of days. To find the number of days between two dates that are not in the same month we find the total remaining number of days in the first month and add the total number of days in the months in between and we find how many days into the last month the ending date is an Add all of those together. To find the number of days between two dates that are not in the same year we will find the remaining number of days in the beginning year the number of days in the years in between the dates and the number of days that the ending date is in the last year. If the year is a leap year February has 29 days.

3. **Pseudocode**

```
FUNCTION daysInMonth(month, year)
  SWITCH month
    CASE 1, 3, 5, 7, 8, 10, 12
      RETURN 31
    CASE 4, 6, 9, 11
      RETURN 30
    CASE 2
      IF isLeapYear(year)
        RETURN 29
      ELSE
        RETURN 28
  ENDSWITCH
```

```
FUNCTION daysBetweenDates(startDay, startMonth, startYear, endDay, endMonth, endYear)
    IF startYear == endYear AND startMonth == endMonth
        RETURN endDay - startDay
    ELSE IF startYear == endYear
        days = daysInMonth(startMonth, startYear) - startDay
        FOR month = startMonth + 1 TO endMonth - 1
            days = days + daysInMonth(month, startYear)
        days = days + endDay
        RETURN days
    ELSE
        days = daysInMonth(startMonth, startYear) - startDay
        FOR month = startMonth + 1 TO 12
            days = days + daysInMonth(month, startYear)
        FOR year = startYear + 1 TO endYear - 1
            FOR month = 1 TO 12
                days = days + daysInMonth(month, year)
        FOR month = 1 TO endMonth - 1
            days = days + daysInMonth(month, endYear)
        days = days + endDay
        RETURN days
```

4. **Copilot**

```
FUNCTION calculateDaysBetween(startDate, endDate):
    INPUT: startDate (year1, month1, day1), endDate (year2, month2, day2)
    OUTPUT: totalDays (integer)

    # Initialize totalDays to 0
    totalDays = 0
```

```
# If the dates are in the same year
IF year1 == year2 THEN:
    # If the dates are in the same month
    IF month1 == month2 THEN:
        totalDays = day2 - day1
    ELSE:
        # Add remaining days in the first month
        totalDays += daysInMonth(year1, month1) - day1
        # Add days for all months in between
        FOR month IN range(month1 + 1, month2):
            totalDays += daysInMonth(year1, month)
        # Add days in the last month
        totalDays += day2

# If the dates are not in the same year
ELSE:
    # Add remaining days in the first year
    FOR month IN range(month1, 13):  # Months from start to December
        IF month == month1 THEN:
            totalDays += daysInMonth(year1, month1) - day1
        ELSE:
            totalDays += daysInMonth(year1, month)

    # Add days in full years in between
    FOR year IN range(year1 + 1, year2):
        totalDays += daysInYear(year)
        # Add days in the last year
        FOR month IN range(1, month2):  # Months from January to the month before the end
            totalDays += daysInMonth(year2, month)
        totalDays += day2

    RETURN totalDays


FUNCTION daysInMonth(year, month):
    # Returns the number of days in a given month and year
    IF month IN [1, 3, 5, 7, 8, 10, 12]:
        RETURN 31
    ELSE IF month IN [4, 6, 9, 11]:
        RETURN 30
    ELSE IF month == 2 THEN:
        RETURN 29 IF isLeapYear(year) ELSE 28


FUNCTION daysInYear(year):
    # Returns the number of days in a given year
    RETURN 366 IF isLeapYear(year) ELSE 365


FUNCTION isLeapYear(year):
    # Checks if a year is a leap year
    RETURN (year MOD 4 == 0 AND year MOD 100 != 0) OR (year MOD 400 == 0)
```

5. **Compare and Contrast**

I think that both versions of the code will work and they will both get the desired output. I think that the Copilot code has a lot more functions which is good because they are going simple things that are easy to understand, and it would be easy to create code based on that. I think that there is more description in the AI code about variables that will be needed. I think that my code is still very comprehensive and it will get the correct results.

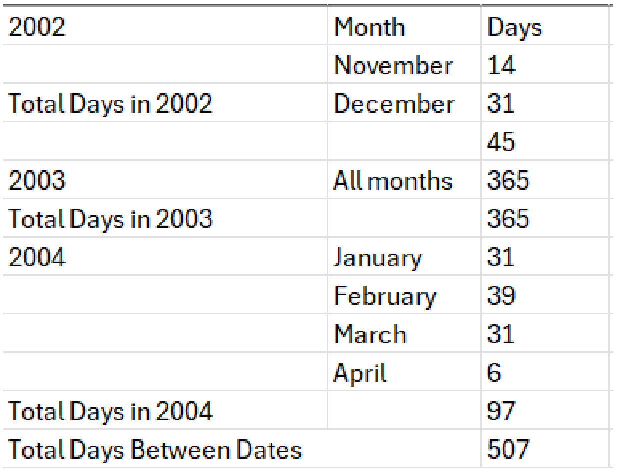
6. **Update**

```
FUNCTION daysInMonth(month, year)
  SWITCH month
    CASE 1, 3, 5, 7, 8, 10, 12
      RETURN 31
    CASE 4, 6, 9, 11
      RETURN 30
    CASE 2
      IF isLeapYear(year)
        RETURN 29
      ELSE
        RETURN 28
  ENDSWITCH

FUNCTION daysBetweenDates(startDay, startMonth, startYear, endDay, endMonth, endYear)
  IF startYear == endYear AND startMonth == endMonth
    RETURN endDay - startDay
  ELSE IF startYear == endYear
    days = daysInMonth(startMonth, startYear) - startDay
    FOR month = startMonth + 1 TO endMonth - 1
      days = days + daysInMonth(month, startYear)
    days = days + endDay
    RETURN days
  ELSE
    days = daysInMonth(startMonth, startYear) - startDay
```

```
FOR month = startMonth + 1 TO 12
  days = days + daysInMonth(month, startYear)
FOR year = startYear + 1 TO endYear - 1
  FOR month = 1 TO 12
    days = days + daysInMonth(month, year)
FOR month = 1 TO endMonth - 1
  days = days + daysInMonth(month, endYear)
days = days + endDay
RETURN days
```

7. Trace



2002	Month	Days
	November	14
Total Days in 2002	December	31
		45
2003	All months	365
Total Days in 2003		365
2004	January	31
	February	39
	March	31
	April	6
Total Days in 2004		97
Total Days Between Dates		507

8. Efficiency

daysInMonth O(1)

daysBetweenDates O(N)

IF startYear == endYear AND startMonth == endMonth O(1)

IF startYear == endYear AND startMonth == endMonth O(1)

OVERALL EFFICENCY

O(n)

Step 1 By Hand: 15 minutes

Step 2 Approach: 20 minutes

Step 3 Pseudocode: 75 minutes

Step 4 Copilot: 15 minutes

Step 5 Compare and Contrast: 20 minutes

Step 6 Update: 8 minutes

Step 7 Trace: 40 minutes

Step 8 Efficiency: 15 minutes