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**

A white table with numbers and a number of days

Description automatically generated

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