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BLG 458E – Functional Programming

Assignment 1

Question 2)

Helper function (sundays') calculates the number of Sundays in given year. It takes a year and a month as parameters to check whether each day of week is Sunday or not. If it is Sunday, it returns a "rest" function call with addition operation, otherwise returns a regular "rest" function call.

If we don't define a "rest" and use its expression where it's needed, the Sundays function would still work. The function "rest" is used to keep code tidy and readable.

Question 5)

We need to calculate number of days in 400 years in order to answer the first question.

$$400 * 365 + 400 * \frac{1}{4} * 1 - 400 * \frac{1}{100} * 1 + 400 * \frac{1}{400} * 1 = 146097$$

400 * 365 days (without leap days)

400 * 1/4 * 1 day (leap day once in four year)

400 * 1/100 * 1 day (leap days divisible by 100)

400 * 1/400 * 1 day (leap days divisible by 400)

There are 146097 days based on the calculation above. Since 146097 is a multiple of 7, there are 20871 weeks which is an integer.

Number of years starting with different day of week in 400 years is given below.

Day	Number	Possibility
Monday	56	14.00%
Tuesday	58	14.50%
Wednesday	57	14.25%
Thursday	57	14.25%
Friday	58	14.50%
Saturday	56	14.00%
Sunday	58	14.50%

Possibility that a certain day of a month (such as 1 Jan) is a Sunday is 14.50%. We can see the possibility is not same for each weekday in 400 years based on the data above.