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MAGIC CALENDAR From (0001–4000)

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ABSTRACT

To find the day of the year from the given date.

Keywords: Odd days, Modulus 7, Multiples of 4, Quotient of leap year (Qly), Quotient of non-leap year (Qny), Remainder 1, Remainder 2.

INTRODUCTION

A calendar is a system of organizing days for social, religious, commercial or administrative purpose. This is done by giving names to period of time typically days, weeks, months, and years. But to find out the day of the week from the given date is a quite long method. Few mathematicians have given some shortcut methods which are quite good so here is one more method to find the day of the week from the given date.

Result: We only find out the number of odd days from the given date and the consider the below given table,

Number of odd days (Required day)	Day we consider
0	Sunday
1	Monday
2	Tuesday
3	Wednesday
4	Thursday
5	Friday
6	Saturday

FOR LEAP YEAR

We divide the given date into 3 parts, A = Date
B = Month
C = Year
Required day (X) = (A+B+C+3) mod7

- Take the value of A as it is given.
- For the value of B we follow the below given table,

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Month	B
January	0
February	3
March	4
April	0
May	2
June	5
July	0
August	3
September	6
October	1
November	4
December	6

- For the value of C we divide the last two digits of the given year by 4 and note down the quotient (Qly) and the follow the given table,

		C						
	Quotient of leap year (Qly)	1 8 15 22	2 9 16 23	3 10 17 24	4 11 18 if(00)	5 12 19	6 13 20	7 14 21
Year								
0001-0100		5	3	1	6	4	2	0
0101-0200		4	2	0	5	3	1	6
0201-0300		3	1	6	4	2	0	5
0301-0400		2	0	5	3	1	6	4
0401-0500		1	6	4	2	0	5	3
0501-0600		0	5	3	1	6	4	2
0601-0700		6	4	2	0	5	3	1
0701-0800		5	3	1	6	4	2	0
0801-0900		4	2	0	5	3	1	6
0901-1000		3	1	6	4	2	0	5
1001-1100		2	0	5	3	1	6	4
1101-1200		1	6	4	2	0	5	3
1201-1300		0	5	3	1	6	4	2
1301-1400		6	4	2	0	5	3	1
1401-1500		5	3	1	6	4	2	0
1501-1600		4	2	0	5	3	1	6
1601-1700		3	1	6	4	2	0	5
1701-1775		2	0	5	3	1	6	4
1776-1800		5	3	1	6	4	2	0
1801-1900		3	1	6	4	2	0	5
1901-2000		1	6	4	2	0	5	3
2001-2100		0	5	3	1	6	4	2

2101-2200		5	3	1	6	4	2	0
2201-2300		3	1	6	4	2	0	5
2301-2400		1	6	4	2	0	5	3
2401-2500		0	5	3	1	6	4	2
2501-2600		5	3	1	6	4	2	0
2601-2700		3	1	6	4	2	0	5
2701-2800		1	6	4	2	0	5	3
2801-2900		0	5	3	1	6	4	2
2901-3000		5	3	1	6	4	2	0
3001-3100		3	1	6	4	2	0	5
3101-3200		1	6	4	2	0	5	3
3201-3300		0	5	3	1	6	4	2
3301-3400		5	3	1	6	4	2	0
3401-3500		3	1	6	4	2	0	5
3501-3600		1	6	4	2	0	5	3
3601-3700		0	5	3	1	6	4	2
3701-3800		5	3	1	6	4	2	0
3801-3900		3	1	6	4	2	0	5
3901-4000		1	6	4	2	0	5	3

Example:
26th October, 1996

Here we divide the date into 3 parts, A, B, and C, also as it is leap year so we add 3 too,

So the required day
X = (A+B+C+3) mod7

Here,
A = 26
B = 1 (From the table of months)

For C,

Taking the last two digits of the year and dividing them by 4 we get,
96/4 = 24 (Qly)

As the year is 1996 so in the row of 1901-2000 and column having 24 as the quotient we get the value of C,
C = 4

Thus we found our all the variables A, B, and C So the required day,

X = (A+B+C+3) mod7
= (26+1+4+3) mod7
= (34) mod7
= 6
= Saturday (from table of days) Thus the required day is Saturday.

FOR NON LEAP YEAR

We divide the given date into 3 parts, A = Date
B = Month
C = Year

Required day (X) = (A+B+C) mod7

- Take the value of A as it is given.
- For the value of B we follow the below given table,

Month	B
January	0
February	3
March	3
April	6
May	1
June	4
July	6
August	2
September	5
October	0
November	3
December	5

- Than for C we divide the last two digits by 4 and note down the quotient (Qny), and also remainder 1 (as R1th term).
- Further we divide the quotient (Qny) by 7 and note down the remainder 2 as R2.
- And then follow the below given table to evaluate C,
- For the years from the following intervals follow Table-1,
- 0001-0100, 0701-0800, 1400-1500, 2101-2200, 2501-2600, 2901-3000, 3301-3400, 3701-3800.

Table-1

R2		0	1	2	3	4	5	6
C	R_1^{th} term							
	$_1st$	5	3	1	6	4	2	0
	$_2nd$	6	4	2	0	5	3	1
	$_3rd$	0	5	3	1	6	4	2

- For the years from the following intervals follow Table-2,
- 0101-0200, 0801-0900, 1501-1600.

Table-2

R2		0	1	2	3	4	5	6
C	R_1^{th} term							
	$_1st$	4	2	0	5	3	1	6
	$_2nd$	5	3	1	6	4	2	0
	$_3rd$	6	4	2	0	5	3	1

- For the years from the following intervals follow Table-3,
- 0201-0300, 0901-1000, 1601-1700,
  1801-1900, 2201-2300, 2601-2700,
  3001-3100, 3401-3500, 3801-3900.

Table-3

R2		0	1	2	3	4	5	6
C	R_1^{th} term							
	1^{st}	3	1	6	4	2	0	5
	2^{nd}	4	2	0	5	3	1	6
	3^{rd}	5	3	1	6	4	2	0

- For the years from the following intervals follow Table-4,
- 0301-0400, 1001-1100, 1701-1752.

Table-4

R2		0	1	2	3	4	5	6
C	R_1^{th} term							
	1^{st}	2	0	5	3	1	6	4
	2^{nd}	3	1	6	4	2	0	5
	3^{rd}	4	2	0	5	3	1	6

- For 1753-1800 follow Table-4.1 given below

Table-4.1

R2		0	1	2	3	4	5	6
C	R_1^{th} term							
	1^{st}	5	3	1	6	4	2	0
	2^{nd}	6	4	2	0	5	3	1
	3^{rd}	0	5	3	1	6	4	2

- For the years from the following intervals follow Table-5,
- 0401-0500, 1101-1200, 1901-2000,
  2301-2300, 2701-2800, 3101-3200,
  3501-3600, 3901-4000.

Table-5

R2		0	1	2	3	4	5	6
C	R_1^{th} term							
	1^{st}	1	6	4	2	0	5	3
	2^{nd}	2	0	5	3	1	6	4
	3^{rd}	3	1	6	4	2	0	5

- For the years from the following intervals follow Table-6,
- 0501-0600, 1201-1300, 2001-2100,
  2401-2500, 2801-2900, 3201-3300,
  3601-3700.

Table-6

R2		0	1	2	3	4	5	6
C	R_1^{th} term							
	1^{st}	0	5	3	1	6	4	2
	2^{nd}	1	6	4	2	0	5	3
	3^{rd}	2	0	5	3	1	6	4

- For the years from the following intervals follow Table-7,
- 0601-0700, 1301-1900.

Table-7

R2		0	1	2	3	4	5	6
C	R_1th term							
	1st	6	4	2	0	5	3	1
	2nd	0	5	3	1	6	4	2
	3rd	1	6	4	2	0	5	3

Example:

- 1st August,2003

We divide the date into three parts A, B, C. Here,
A = 1
B = 2 (From the table of months for non-leap year)

For C,

We divide the last two digits of the year by 4 so we get,
03/4
Quotient (Qny) = 0
Remainder 1(R1) = 3 (i.e. 3rd term)

Now we divide the quotient (Qny) by 7 so we get,
0/7
Remainder 2(R2) = 0

And our year is 2003 which is in the interval of 2001-2100 which is Table-6,

So from table-6 we select the 0 in R2 and then 3rd term in it as our required C which is C=2.

Thus we found all the variables A, B and C. Therefore required day X is,

X = (A+B+C) mod7
= (1+2+2) mod7
= (5) mod7
= 5
= Friday. (From the table of days) Thus the required day is Friday.

CONCLUSION

Using the above method it is quite easier to find the day of the week from the given date in the interval of years from (0001-4000).

REFERENCE

1. www.timeanddate.com

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