Calendar Program

Edward Birdsall

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1 Introduction

This program set are programs to display and printout a calendar of events for the user. It should be able to display a number of different calendars both real and fictional. The python verion is intended to have a number of different UIs which the C version is primarily a command line interface and the Fortran version for use in programs. I've written bits and pieces in various computing languages over the decades and have lost some versions so this is an attempt to get it all together, written and working on the linux platform. Another hope is to do it well enough in python to make it portable to other platforms. Porting to other operating systems is low priority for me but may be done as an exercise.

Different calendars desired:

- Gregorian - ideal and convert to Julian for dates before 10/15/1582 (10/5/1582 Julian == 10/15/1582 Gregorian begin)
- Julian
- Shire
- Oriental
- Jewish
- Scientific - 13 months of 28 days, midDay is between the 14th and 15th of the seventh month as well as LeapDay both of which are not part of the week
- perpetual - similar to Scientific
- Mars MDay=24hrs,39min 35 seconds Myear is 668.82 MDays = 687 EDays
- lunar
- lunar
- Various other proposed calendar ideas

User Interfaces for the program set; Graphical, Web Browser and Command Line. Depending on the user interface not all features may be available. Below is a listing of various program features and subfeatures;

- printout a calendar
  - Day's events
  - by week
  - by month
  - by year
  - blank calendar (month, year)
  - for calendars week long or greater give an option as to which is the starting day of the week
- convert between calendars
- account for time zones based on location
- schedule an event
- be able to invite other people by e-mail-ics-gcal
- be able to import events from iCal and other calendars
- printout or email day's events to user using preferred calendar structure or random calendar
- support multiple calendars for each user

2 Calendar Information

2.1 Gregorian

365 days per year except leap year has 366. Has 12 months with 28, 29, 30 or 31 days. Months are; January(31 Days), February(28,29 days), March(31 days), April(30 days), May(31 days), June(30 days), July(31 days), August(31 days), September(30 days), October(31 days), November(30 days), and December(31 days). Converted from Julian calendar on 10/15/1582 Julian becoming 10/15/1582 Gregorian in some locations.

2.2 Julian

365 days per year with 12 months with 28, 29, 30 or 31 days. Months are; January(31 Days), February(28 days), March(31 days), April(30 days), May(31 days), June(30 days), July(31 days), August(31 days), September(30 days), October(31 days), November(30 days), and December(31 days). Converted from Julian calendar on 10/15/1582 Julian becoming 10/15/1582 Gregorian in some locations.

2.3 Shire

The Shire calendar found in J.R.Tolkein Ring series has twelve months of thirty days with four days not in a month and one or two not in a month or week. Each year starts on 2Yule which is Sterrendei (equivalent to Saturday). The year pattern is 2Yule, 1-30 Afteryule, 1-30 Solmath, 1-30 Rethe, 1-30 Astron, 1-30 Thrimidge, 1-30 Forelithe, 1Lithe, [Midyear's Day, (Overlithe)], 2Lithe, 1-30 Afterlithe, 1-30 Wedmath, 1-30 Halimath, 1-30 Winterfilth, 1-30 Blotmath, 1-30 Foreyule, 1Yule. Overlithe added for leap years and Midyear's Day are not part of any week.

Days of the week are; Sterrendei, Sunnendei, Momendei, Trewesdei,Hevenesdei, Meresdei, and Highdei.

2.4 Oriental

Chinese Zodiac animals - monkey, rooster, dog, pig, rat, ox, tiger, rabbit, dragon, snake, horse, sheep

2.5 Jewish

- A month is calculated as 29 days, 12 hours, and 793 "parts"
- Leap years occur in years 3, 6, 8, 11, 14, 17 and 19 of a 19-year cycle
- Adjustments (dechiyot) prevent round off the date calculated
- Dechiyot prevent oddities in the length of the year
- Dechiyot prevent holidays from falling on the wrong day of the week
- Some months have variable lengths
- There are 14 possible formats of year, identified by codes
- The calendar is not perfect, but it is very accurate

2.6 Scientific / International fixed

13 months of 28 days which starts on Sunday,
midDay is between the 14th and 15th of the seventh month as well as LeapDay both of which are not part of the week

2.7 perpetual?

This calendar was proposed a while ago and I don't remember all the details. It has thirteen months of twenty eight days with MidDay between the fouteenth and fifteenth day of the seventh month. MidDay and LeapDay which is added on leap years are not part of the week similar to the Shire Calendar.

2.8 Mars

MDay=24hrs,39min 35 seconds Myear is 668.82 MDays = 687 EDays

2.9 Earth Lunar

2.10 Various Other proposed calendars

3 Calendar Structures

Date - Year - Day of Year Time - Zulu time zone (Greenwich Mean time) - Seconds from midnight

Calendar Event Structure

- date and time start
- date and time end
- duration
- location - ?URL to location map
- originator
- invitees
- invitees status
- description/agenda
- date and time created
- frequency - interval and end criteria??

4 Calendar Routines/functions/...

4.1 Common

4.2 Gregorian

Gregorian Calendar 12 months of varying days and various starting days

month names = January, February, March, April, May, June, July, August, September, October, November, December days names = Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday Gregorian Year - Month - Day of Month - Time - time zone - Day of Week
This calendar was started in year 1582 A.D. with a date shift
from the existing calendar so need to put that in the
algorithm. 10/5/1582==10/15/1582

Year - Christian calendar wih A.D. and B.C.
Month - 12 months of varying days, second month changes number of
days if leap year
January-31, February-28?29, March-31, April-30, May-31, June-30
July-31, August-31, September-30, October-31, November-30,
December-31
Day of Month - see above for days in each month
Time - Earth 24 hour time
Time Zone - ranges from -12 to +12 with 0 being Zulu
Day of Week - 7 days per week, each year starts on a different day
Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday

enum Gdow Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday; enum GMon January, February, March, April, May, June, July, August, September, October, November, December enum Gry 31,28,31,30,31,30,31,31,30,31,30,31 enum Gly 31,29,31,30,31,30,31,31,30,31,30,31 Years divisible by 4 a leap year except divisible by 100 unless divisible by 400 logical isaLeapYear(int year) If (year mod 4) ¡¿ 0 then isaLeapYear = FALSE; else isaLeapYear = TRUE; If (((year mod 100) == 0) and ((year mod 400) ¡¿ 0)) then isaLeapYear = FALSE; return isaLeapYear;

4.3 Julian

Year - Day - Time

Year - could be Christian or some other - pick is Christian Day - First day of the year is 1 and then sequentially numbered till end of year Time - Earth 24 hour day at Zulu (Greenwich Mean Time) 24 hours/day, 60 minutes/hour, 60 seconds/minute

4.4 Shire

12 months of 30 days year starts on (Saturday) Sterrendei with 2 Yule

month names = Afteryule, Solmath, Rethe, Astron, Thrimidge, Forelithe, Afterlithe, Wedmath, Halimath, Winterfilth, Blotmath, Foreyule Days names = Sterrendei, Sunnendei, Momendei, Trewesdei, Hevenesdei, Meresdei, Highdei

Year =¿2Yule, Afteryule, Solmath, Rethe, Astron, Thrimidge, Forelithe, 1Lithe, Midyear's Day, (Overlithe), [Not days of any week, overlithe for leap year] 2Lithe, Afterlithe, Wedmath, Halimath, Winterfilth, Blotmath, Foreyule, 1Yule

Shire
Year - Month - Day of Month - Time - time zone - Day of Week

Year - ?
Month - 12 months of 30 days - 5 days not part of any month or week
Afteryule, Solmath, Rethe, Astron, Thrimidge, Forelithe,
Afterlithe, Wedmath, Halimath, Winterfilth, Blotmath, Foreyule
Day of month - 1 to 30 with a few days not part of any month
Time - Earth 24 hour time

Time Zone - ranges from -12 to +12 with 0 being Zulu
Day of Week - 7 days per week, each year starts on Sterrendei
Sterrendei, Sunnendei, Momendei, Trewesdei, Hevenesdei,
Meresdei, Highdei
Year's progression
2Yule, Afteryule, Solmath, Rethe, Astron, Thrimidge, Forelithe,
1Lithe,
Midyear's Day, (OverLithe), - these two are not part of the week
2Lithe, Afterlithe, Wedmath, Halimath, Winterfilth, Blotmath,
Foreyule, 1Yule

```
int Shire2internal(gdates itime, edaet ftime)int gregorian2internal(gdates itime, edaet ftime)
{
int errNum = 0;
int maxdays;
struct etyme theTime;

isleap(itime.year) ? maxdays = 366 : maxdays = 365;
if (itime.zone != 0)
{
errNum = local2zulu(itime.etyme, itime.zone, theTyme);
if (theTyme.hour > 23)
{
itime.day += 1;
theTyme.hour -= 24;
}
if (theTyme.hour < 0 )
{
itime.day -= 1;
theTyme.hour += 24;
}
}
errNum = etime2seconds(theTyme, ftime.seconds);
ftime.year = itime.year;
switch (itime.month)
{
case  0: \\ Days outside of months
if (itime.day == 1) ftime.days = 1;
case  1: \\ Yule
ftime.days = itime.day + 1;
if (itime.day < 0 )
{
isleap((itime.year - 1)) ? ftime.days = 366 : ftime.days = 365;
ftime.year -= 1;
}
break;
case  2: \\ Solmath
ftime.days = itime.day + 31;
break;
case  3: \\ Rethe
ftime.days = itime.day + 61;
break;
case  4: \\ Astron
```

```
ftime.days = itime.day + 91;
break;
case  5: \\ May - 31
ftime.days = itime.day + 121;
break;
case  6: \\ June - 30
ftime.days = itime.day + 151;
break;
case  7: \\ July - 31
isleap(itime.year) ? ftime.days = 181 + itime.day : ftime.days = 182 + itime.day;
break;
case  8: \\ August - 31
isleap(itime.year) ? ftime.days = 212 + itime.day : ftime.days = 213 + itime.day;
break;
case  9: \\ September - 30
isleap(itime.year) ? ftime.days = 243 + itime.day : ftime.days = 244 + itime.day;
break;
case 10: \\ October - 31
isleap(itime.year) ? ftime.days = 273 + itime.day : ftime.days = 274 + itime.day;
break;
case 11: \\ November - 30
isleap(itime.year) ? ftime.days = 304 + itime.day : ftime.days = 305 + itime.day;
break;
case 12: \\ December - 31
isleap(itime.year) ? ftime.days = 334 + itime.day : ftime.days = 335 + itime.day;
if (ftime.days > maxdays)
{
ftime.year += 1;
ftime.days = 1;
}
break;
}
return (errNum);
}
```

4.5 Oriental

```
year = int(input("Enter a year: "))
zodiacYear = year % 12
if zodiacYear == 0:
    print("monkey")
elif zodiacYear == 1:
    print("rooster")
elif zodiacYear == 2:
    print("dog")
elif zodiacYear == 3:
    print("pig")
elif zodiacYear == 4:
    print("rat")
elif zodiacYear == 5:
    print("ox")
```

```
elif zodiacYear == 6:
    print("tiger")
elif zodiacYear == 7:
    print("rabbit")
elif zodiacYear == 8:
    print("dragon")
elif zodiacYear == 9:
    print("snake")
elif zodiacYear == 10:
    print("horse")
else:
    print("sheep")
```

4.6 Jewish

- A month is calculated as 29 days, 12 hours, and 793 "parts"
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- Adjustments (dechiyot) prevent round off the date calculated
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4.7 Scientific/International Fixed

Scientific / International Fixed
Year - Month - Day of Month - Time - time zone - Day of Week

Year - ?
Month - 13 months
Day of month - 1 through 28 with MidDay and LeapDay not part of month
Time - Earth 24 hour time
Time Zone - ranges from -12 to +12 with 0 being Zulu
Day of Week - 7 days per week, each year starts on Sunday
Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday
January, February,March, April,May,June,Sol,July,August,September,October,November,December YearDay and LeapDay not part of any week
YearDay is at the end of December
LeapDay is between June and Sol on leap years

4.8 perpetual

perpetual Year - Month - Day of Month - Time - time zone - Day of Week

Year - ? Month - 12 months 8-30 4-31 Day of month - 1 through 28 with MidDay and LeapDay not part of month
Time - Earth 24 hour time
Time Zone - ranges from -12 to +12 with 0 being Zulu
Day of Week - 7 days per week, each year starts on Sunday
Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday
MidDay and LeapDay not part of any week
WorldDay is last day of year except every 4th year
LeapDay is with MidDay on leap years

4.9 Mars

Mars1
MDay = 24 hours, 39 minutes, 35 seconds of ETime
MYear = 668.62... MDays = 687 EDays

4.10 lunar

4.11 Various other proposed calendar ideas