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A Novel Rule to Design a Perpetually Christian Calendar

Hesham S. Ridha
Department of Computer Science, College of Education, University of Basrah
Basrah – IRAQ
zrazan@yahoo.com
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Abstract

The Christian Calendar is a gapped Calendar submitted to the mandatory of the papal authorities. Functionally, its two versions cannot be associated with each other. Surely, the Georgian Calendar cannot be drawn backwards neither to the starting point of AD's "Anno Domini" nor to the BC's "Before Christ" Eras; as well as the Julian one which hardly can keep pace forwards after its deadened; however, some countries used it into the early 1900s. Then, one can judge that, a rigorous rule to emulate a Perpetually Christian Calendar Eras is possibly hardly to obtain. In this study, a new version of the Christian Calendar had been made. By considering the "Sunday" to be the Christ birthday, we animate Dionysius calendar theory to gain a successful initial epoch day for the AD's Era which we named to be the (Springboard Day). On the other hand, the axioms of reporting the (first & last) day for any sequence of years provides the headlines to design a simple tractable algorithm that illuminates the boundless timeline.

Based upon our analysis, we expect this algorithm to be a novel rule that can be used to accomplish the variety of BC's rather than AD's Eras computations

Keywords: Calendar, Christian Calendar, Julian Calendar, Gregorian Calendar, Perpetually Calendar.

1. Statement of the Problem

A calendar is a system devoted to organize the units of time for the purpose of reckoning time over extended periods to satisfy the society necessities. The generality of this definition is due to the diversity of methods that have been used in creating calendars. Although some calendars replicate astronomical cycles according to fixed rules, others are based on abstract, perpetually repeating cycles of no astronomical significance. Some calendars are regulated by astronomical observations, some carefully and redundantly enumerate every unit, and some contain ambiguities and discontinuities. Some calendars are codified in written laws; others are transmitted by oral tradition [1].

By convention, the astronomical bases of calendars could be listed as a set of three harmonic elements, they are: (Day, Month, and Year) [1]:

- Day is considered to be the smallest calendrical unit of time. It is based on the rotation of the Earth on its axis. The measurement of fractions of a day is classified as timekeeping.
- Month is a set of days which supposed to rely on the revolution of the moon around the earth. The Week is a subset derived from the month consists of seven days.
- Finally, the Year to be the set of days counted from the revolution of the earth around the sun.

Because these cycles of revolution do not comprise an integral number of days, moreover their astronomical cycles are neither constant nor perfectly commensurable with each other; complexity of calendars rules arises. Therefore, according to a recent estimate, there are about forty calendars in the world currently used nowadays [2]. One of these calendars is the Christian Calendar which is considered to be the ore of the

Julian Calendar and its updated version the widespread Georgian Calendar [1, 2].

Although the mentioned calendars are based on mathematical rules, nevertheless their birth was infirm due to interposition of religious authorities that laid to obvious variation. By 1582 vernal equinox had moved approximately eleven days backwards. These days had to be dropped from the Julian Calendar [1,2] . Certainly, the algorithms which had been given for correlating the Christian Calendrical systems, will reveals that even the standard calendars are subject to local variation.

This paper is consecrated to present a Perpetually Calendar algorithm that gives a concrete reform to the Christian calendar. The algorithm is based on an extinct rule, intuitive facts, and our restricted Springboard Day. These bases enhance the algorithmic scheme which emphasizes a reliable simple function to provide an accurate presentation to the (BC 's & AD 's) Calendars.

The research is inlaid with atelier sections. In Section one, we have already put forward the statement of the problem. Section two provides opulent tour to the historical summaries of Christian calendar fundamentals rather than their former approaches. Section three is a standpoint to the algorithm organization. The output results and a sufficient discussion shall be displayed in Section four. The final section donates a sweeping view to the conclusion of this work.

Despite the vast literature on calendars, truly authoritative references, particularly in English, are difficult to find. With modesty, the suggested calendrical algorithm could be published alike in other journals in different countries. The author would like to acknowledge his unawareness of these works with all due respect to those researchers.

2. Historical Background

Although the “Christian Calendar” is a popular pronounced term; a few people had awareness of its historical setting mistakes. This section shall undertake the principles from which the Christian Calendar versions were born; touching on the ensuing mess from the calendar switching process between these versions; bringing up the most prevail approaches to map the last version, that is the Gregorian Calendar.

2.1 Christian Calendar Fundamental Point of View :

The Christian calendar originated in pre-Christian Rome, traditionally used to designate the calendar commonly in use. Its years consist of 365 or 366 days divided into 12 months that have no relationship to the motion of the moon. In parallel with this system, the concept of weeks groups the days in sets of 7.Two main versions of the Christian calendar have been existed; they are the Julian calendar and its updated version the Gregorian calendar [2].

The first version embodiments in the Julian calendar which was introduced by Julius Caesar [2] in 45 BC. It was in common use until the late 1500s, when countries started changing to the Gregorian calendar because of a papal interference. The tropical year in the Julian calendar is approximated as 365 $^{1}/_{4}$ days = 365.25 days. The approximation 365 $^{1}/_{4}$ is achieved by having 1 leap year every 4 years (i.e. *all* years exactly divisible by 4 be leap years). In spite of this achievement, the 4-year rule was not followed in the first years after the Julian calendar introduction. Yet, due to a religious counting error, every 3rd year was considered to be a leap year in the first fifty years of this calendar's existence. The leap years were: (42 BC, 39 BC, 36 BC, 33 BC, 30 BC, 27 BC, 24 BC, 21 BC, 18 BC, 15 BC, 12 BC, 9 BC, AD 8, AD 12, and every 4th year from then on !). Authorities disagree about whether 45 BC was a leap year rather the period between 9 BC to AD 8 either [2].

The second version of the Christian calendar is represented in the Gregorian calendar. The Gregorian calendar is a solar arithmetical calendar commonly used nowadays. Its tropical year is approximated as 365 $^{97}/_{400}$ days = 365.2425 days. It counts days as the basic unit of time, grouping them into years of 365 or 366 days[3]. This calender was proposed by Aloysius Lilius [1, 2, 3], a physician from Naples, decreed by Pope Gregory XIII in a papal bull on 24 February 1582 to correct the errors which were found in the older Julian Calendar. The changes were made by Gregory, corrected the drift in the Julian calendar year which was slightly too long, causing the vernal equinox, and consequently the date on which Easter was being celebrated, to slowly drift forward in relation to the seasons. So, the Gregorian calendar system dropped almost eleven days from the older calendar in order to give the civil calendar a religious synchronization with the seasons. To keep its stability, the new calendar adopted the following leap year rule: "Every year that is exactly divisible by 4 is a leap year, except for years that are exactly divisible by 100; these centurial years are leap years only if they are exactly divisible by 400"[1, 2, 3].

The order of months and number of days per month of Georgian Calendar were adopted from the Julian calendar. The following table lists that order [1].

Month			Month		
Order	Name	Days no.	Order	Name	Days no.
1st	January	31	7th	July	31
2nd	February	28*	8th	August	31
3rd	March	31	9th	September	30
4th	April	30	10th	October	31
5th	May	31	11th	November	30
6th	June	30	12th	December	31
* In a leap year, February has 29 days.					

Table (1) : Months of the Gregorian Calendar

2.2 The Consequent Confusion on Switching to the Gregorian Calendar

Te last day of the Julian calendar was on Thursday October 4, 1582 directly followed by the first day of the Gregorian calendar, Friday October 15, 1582 [3]. The cycle of the weekdays, which must be taken in consederation, was not affected .

Figure (1): Gregory XIII celebrating the introduction of the Gregorian calendar [3]; ***for perception only***

Despite the bull to switch the Julian Calender, only four (Catholic) countries adopted the Gregorian calendar on the date specified by the bull. Other Catholic countries experienced some delay before adopting the reform; and non-Catholic countries, not being subject to the decrees of the Pope, initially they rejected or simply ignored the reform altogether, although they all eventually adopted it [3].

The following table contains the dates for changes in a number of countries. Seemingly, it is very strange that in many cases there were some doubt among authorities about what the correct days are [2].

Table (2): Dates of adopting Gregorian Calendar in some countries in Europe.

Country	Year of Gregorian Calendar adoption	Shifting day		
		From	To	Total days
Austria	1583	5 Oct.	16 Oct.	11
		14 Dec.	25 Dec.	11
Bulgaria	1916	31 Mar.	14 Apr.	14
Canada	1752	2 Sep.	14 Sep.	12
Czechoslovakia	1584	6 Jan.	17 Jan.	11
Denmark	1700	18 Feb.	1 Mar.	12
Norway				
Estonia	1918	31 Jan.	14 Feb.	14
France	1582	9 Dec.	20 Dec.	11
Germany	1610	22 Aug.	2 Sep.	10
Great Britain	1752	2 Sep.	14 Sep.	12
Greece	1924	9 Mar.	23 Mar.	14
Hungary	1587	21 Oct.	1 Nov.	11
Italy	1582	4 Oct.	15 Oct.	11
Poland				
Portugal				
Luxemburg	1582	14 Dec.	25 Dec.	11
Holland	1583	1 Jan.	12 Jan.	11
Belgium				
Romania	1919	31 Mar.	14 Apr.	14
Russia	1918	31 Jan.	14 Feb.	14
Sweden	1753	17 Feb.	1 Mar.	12

2.3 Perpetually Christian Calendrical Algorithmic Approaches:

There are a lot of approaches that had been adopted to echo the accession mankind calendrical desires. Parise (1982) [1] provided useful, though not infallible, tables for date conversion. Aveni (1989) [1] surveys a broad variety of calendrical systems, stressing their cultural contexts rather than their operational details. The sections on "Calendars" and "Chronology" in all editions of the *Encyclopedia Britannica* [1] provide useful historical surveys. Formulas for computing the Julian date from the Gregorian one for all AD's Era are given in Danby (1988) [1] and Sinnott (1991) [1]. Also Claus [2] had listed algorithmic answers to the plenty of Christian calendrical needs in AD's Era such as:

- When can I reuse my 1992 calendar ?
- How does one calculate Gregorian Easter ?
- What day of the week was 1 December 1960?

For the Perpetually Christian Calendar, just three approaches are found. One such algorithm was named as Zeller's [4] algorithm which was invented in the late of 1800s. Actually Zeller's algorithm works only for those dates starting with the use of the Gregorian Calendar in the year 1582. Since the Gregorian Calendar will be off one full day in the year 4902, this algorithm works for any dates between 1582 and 4902 [5].

The brothers Hennacy's (2005) [4] established a tabulated Perpetually like Christian calendrical algorithmic approach for the interval in between (1700's – 2400's) AD. Their algorithm depended on three cornerstone tables , they are :

Table (3): The brothers Hennacy's cornerstone symbol table

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
D	0	1	2	3	4	5	6

Table (A) : Days and their symbols

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
M	6	2	2	5	0	3	5	1	4	6	2	4

Table (B) : Months and their symbols

	1700	1800	1900	2000	2100	2200	2300	2400
C	5	3	1	0	5	3	1	0

Table (C) : Centuries and their symbols

On the other hand, Java^{TM} [6], put the versions of Christian Calendars together into service. Their four digits implementations on (BC and AD) Eras handle a single discontinuity, which corresponds by default to the date the Gregorian calendar was instituted (October 15, 1582 in some countries, later in others). The cutover date can be changed by the user call only [6].

The goal of this work is to accomplish a simple algorithm that has springboard from which one can flaunt backward all the BC's as well as the AD's forward eyeshot. Due to its perspective analytical paradigm, definitely, it can be perceived by even a tyro programmer.

3. Algorithm Phases

The proposal algorithm own two phases. The first one, is a planning phase that concerns with mapping an Analytical Framework while the second phase will flaunt the Planned Algorithm.

3.1 Analytical Framework

Counting of years from an initial epoch is the most successful way of maintaining a consistent chronology. This epoch must be tied with an historical or legendary event even [1].

As we had mentioned in Section 1, our approach depends on three consistent bases which exist in the extinct rule [1, 2], intuitive facts [2, 3], and our substantial Springboard Day. These bases can be depicted as follows:

3.1.1 Dionysius Exiguus theory

By the 6th century the scholar Dionysius Exiguus [1] adopted a presumed birthday of Christ *(Allah's blessing and peace be upon him)* to be the initial epoch of the Christian calendar. Dionysius rule (AD 523), so-called as "*Alexandrine*" rule, fixed Jesus birth *(Allah's blessing and peace be upon him)* in such a manner that it falls on 25 December 753 AUC *(Ab Urbe Condita ,i.e. since the founding of Rome)* ; thus making the Christians Era start with AD 1 on 1 January 754 AUC (i.e. Dionysius let the year AD 1 starts one week after what he believed to be Jesus' birthday *(Allah's blessing and peace be upon him)*) [2].

The basis for Dionysius calculations rests on the Gospel of Luke (3:1 & 3:23) which declared that Jesus (*Allah's blessing and peace be upon him)* was "about thirty years old" shortly after the fifteenth year of the reign of Tiberius Caesar [2] which become emperor in AD 14. If you combine these numbers you would, certainly, reach the birth year for Jesus (*Allah's blessing and peace be upon him)* that is strikingly close to the beginning of Dionysius reckoning year [2]. We can illustrate the last statement using the following equation :

AD 14 (of Tiberius induction) + 15 (Years of Tiberius reign time) = 29 year ≈ 30 year of Jesus age … (1)

Dionysius Exiguus years are divided into two classes: common years and leap years. A common year is 365 days in length while a leap year is 366 days with an intercalary day, designated February 29, preceding March 1 [2].

3.1.2 Intuitive Facts

Here are two facts from which we can pave our proposal algorithm:

- The first fact is concerned with the timeline representation. That is; for dates before the year 1, Gregorian calendar (like the Julian calendar) does not have a year 0; instead they use the ordinal numbers 1, 2, … . Thus the traditional timeline sequence is (…., 2 BC, 1 BC, AD 1, AD 2, …..) [3]. So, When people started dating years using the term ``Before Christ'', they let the year 1 BC immediately precede AD 1 with no intervening year zero [2]. The selected fact can be abbreviated in the following equation :

BC 1 + 1 = 1 AD … (2)

- The second fact is a statistic one. The non-leap years always begin and end on the same day of the week; whereas leap years end on the next day of the week from which they begin [3]. For example, 2007 (as a non-leap year) began on a Monday and ended on a Monday too; while, on the contrary , the year 2008 (as a leap year) began on Tuesday and should end on Wednesday *(God willing)*. Thus, not counting leap years will induce any calendar beginning date moving it to the next day of the week that the former year has beganwith. In the same manner, the equations below can epitomize this fact:

Let:
NewYearNo = NYN
DecLastDayFormerYear = DLDFY
JanFirstDayNewYear = JFDNY
DecLastDayNewYear = DLDNY
ShiftDayOrder = SDO

Then:
JFDNY = DLDFY + SDO …(3)

$$DLDNY = \begin{cases} (JFDNY + SDO) \text{ iff } (NYN \bmod 4) = 0 \\ JFDNY \quad \text{otherwise} \end{cases} \quad ….(4)$$

3.1.3 Springboard Day

Dionysius rule had been dropped from the outset because Dionysius did not establish an accurate date for the birth of Christ *(Allah's blessing and peace be upon him)* as what the scholars believe. Although scholars generally believe that Christ *(Allah's blessing and peace be upon him)* was born before AD 1, the historical evidences are too sketchy to allow a definitive dating [1].

Perhaps one might wonder, "In Dionysius lifetime, why didn't he try to name a starting weekday for Christian initial epoch date (1/ January / AD 1) taking into consideration the starting weekday of his lifetime epoch (1/ January / AD 523)?". A simple calculation process, with a reasonable time, to the probability of nominating a starting weekday from the set of weekdays taking into account the mentioned intuitive facts; by all means that process will reveal a certain weekday to the Dionysius dogma.

In this paper, we had succeeded by putting up the Sunday weekday as a Springboard candidate day to the prime of the Christian Era; revitalizing Dionysius theory to be the evidence on our work.

Why did this paper choose "Sunday" to be the "Springboard Day" not any other day of the weekdays? The answer of this astonishing question is divided into two parts. The second part is a "Probation" to the "Religious Hypothesis" part. These parts can be explored in the following manner :

- As all we know, there is a hallowing weekday in every religion. The Christian believe in "Sunday", as Muslims believe in "Friday". My proposed myth is based on the assumption that "IF Mohammed the Prophet *(Allah's blessing and peace be upon him and his kindred)* was born on "Friday" [7], it is possible that Christ's birthday *(Allah's blessing and peace be upon him)* took place on "Sunday".
- If the date (25/12/ 1 BC) was a "Sunday" then logically the year AD1 will acquire the "Sunday" as a starting day too. Undoubtedly, the year AD 2008 will wind up at "Tuesday" to be its starting day.

3.2 The Proposal Algorithm

After all the persuasive expatiation and their consolidated equations which are treated in the former phase; certainly the object algorithm can be able to score. The algorithm exhibits the gist; that is the "January First Day " together with "December Last Day" for any given "Year" whether it is a BC or an AD year. Then the Calendar formalization process will be a simple problem to solve.

To catch the right sight, we'll map the proposed algorithm into two sights. The "Helicopteric sight" gives the programmer a bird's eye view to sketch the program, while the "Thorough sight" provides him a comprehensive look to accomplish the task.

3.2.1 The Helicopteric Sight

After pinpointing all needed elements, this sight could have the following outline :

```
Begin
 Input your SelectedYear
 If the SelectedYear is a BC Year then
    begin
      rewind BCera
     If the SelectedYear is a NonLeapYear Then Execute the NonLeapYearPhase
       Else Execute the LeapYearPhase
   end
  else If the SelectedYear is an AD Year then
    begin
      rewind ADera
     If the SelectedYear is a NonLeapYear Then Execute the NonLeapYearPhase
       Else Execute the LeapYearPhas
```

```
end
 End IF
End
 Output the (SelectedYear, January First Day, December Last Day)
```

3.2.2 The Thorough sight :

On putting the Helicopteric sight under a microscope view, a detailed Perpetually Calenrical Algorithm will be carried out.

```
Begin
 Input your SelectedYear
 If (SelectedYear > 0) Then
   begin
     InitialDayNo=1;
     FinalDayNo=1;
     For (K =1) To (K ≤ SelectedYear) Do
       begin
         If mod (K / 4) ≠ 0 Then
           begin
           FinalDayNo = InitialDayNo
           If (FinalDayNo > 7) Then FinalDayNo = 1
           end
         Else If mod (K / 4) = 0 Then
           begin
             FinalDayNo = InitialDayNo+1
             If (FinalDayNo>7) Then FinalDayNo=1
             end
         End If
         JanFirstDay = InitialDayNo
         DecLastDay = FinalDayNo
         InitialDayNo = FinalDayNo+1
       End For
 End if
 If ( SelectedYear < 0) Then
  begin
   InitialDayNo=7
   FinalDayNo=7
   For (K = -1) DownTo (SelectedYear) Do
     begin
       If mod (K / 4) ≠ 0 Then
         begin
           InitialDayNo = FinalDayNo
           If (InitialDayNo<1) Then InitialDayNo = 7
         end
       Else if mod (K / 4) = 0 Then
```

```
                begin
                  InitialDayNo = FinalDayNo - 1
                  If ( InitialDayNo < 1 ) Then InitialDayNo = 7
                end
      End If
        JanFirstDay = InitialDayNo
        DecLastDay = FinalDayNo
        FinalDayNo = InitialDayNo - 1
      End For
End If
Case (JanFirstDay) Of
   1 : InitialDayName is "SUN"
   2 : InitialDayName is "MON"
   3 : InitialDayName is "TUE"
   4 : InitialDayName is "WED"
   5 : InitialDayName is "THU"
   6 : InitialDayName is "FRI"
   7 : InitialDayName is "SAT"
End Case
Case (DecLastDay) Of
   1 : FinalDayName is "SUN"
   2 : FinalDayName is "MON"
   3 : FinalDayName is "TUE"
   4 : FinalDayName is "WED"
   5 : FinalDayName is "THU"
   6 : FinalDayName is "FRI"
   7 : FianlDayName is "SAT"
End Case
If (SelectedYear = 0) Then
 begin
   Year No. = SelectedYear
   Output the SelectedYear is Not included year
End If
End
```

4. Results and Discussion

Of course, the Christian Calendar designation is a process based upon a thorough study of the solar system in such a manner that the priesthood can keep to their religious occasions. In practice, this theory failed partly due to priesthood ignorance by making certain years long and other years short; furthermore, leap years were avoided in time of crisis [2]. Although algorithms had been given for correlating the calendrical systems, close examination reveals that even the standard calendars are subject to local variation.

Among its deep cruise; this paper results :

- ☞ A condensed standpoint that is; during all Eras there are a lot of discontinuities in the century switiching process, except in between the 19th and 20th centuries. Though the Calendar munufacture can illuminate only a Christian Calander for a single century, a shortcut to your personal computer calendar as well as your mobile phone will reveal the truth of this issue.
- ☞ Dspite that truth, this paper has succeeded in flooring a theoritial springboard that emendated all previous BC's and AD's Eras equalizing with the 19th and 20th century to go endlessly.

☞ Moreove, it incises a case to be studied that is, the suggested weekday for Christ's birthday which was on "Sunday".

☞ A moral result had come out when this paper compensated those pepole who lost their rights at the time of switching the calendar from its Julian version to the Gregorian one [3]. See Figure (2).

Figure (2): William Hogarth (*c.* 1755) painting which is the main source for "Give us our losten days"

5. Conclusions

In this paper a simple Christian Calendar algorithm has been suggested. The algorithm is based upon three compressed forms of knowledge representation that are streamlines computations; they are the Dionysius rule, the derivation of (initial & terminal) days of the year , and our Springboard day. Figure (3) provides a birds eye view to the magnitude of our work.

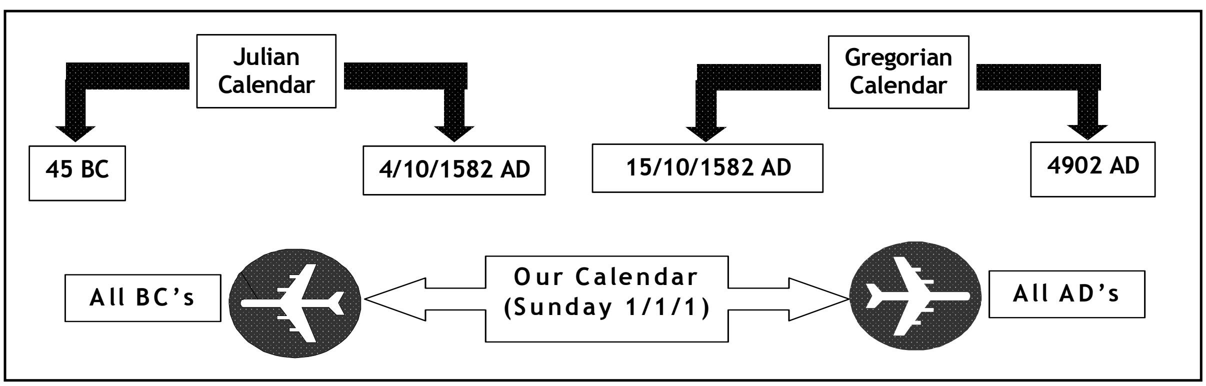

Figure (3): A pictorial differences between our Calendar and the (Julian & Gergorian) Calendars

The content of this study could be considered as a novel version of the Christian Calendar that can be exploited to give the answer to a variety of questions about calendrical items. With our role, its possible to manufacture an integrated calendrical software system that can emulate the bases for: (Planning Agricultural, Migration Cycles, Prognostication, Maintaining Cycles of Religious and Civil Events, and for building a concrete calendical Database in Computers and Mobiles).

In a few word, we had earned a new calendar system that can be serve as a source of social order and cultural identity. Table (3) provide useful information about the (First & Last) Day in some randomly selected years.

Table (3) : Useful information about the (First & Last) Day in some randomly selected years.

Year	Era.	First Day	Last Day
369870	BC	Saturday	Saturday
1953	BC	Tuesday	Tuesday
2009	AD	Thursday	Thursday
96587664	AD	Saturday	Sunday

6. References

[1] L.E. Doggett, P.K. Scidelmann (Ed.), “Calendars and Their History”, Explanatory Supplement to the Astronomical Almanac, Sau Salito, CA: University Science Books, 1992.

[2] Claus Tondering, “Julius og Gregor.”, Denmark, ISBN 978-8792032-58-4, 2007.

[3] Duncan, D. E., “Humanity’s Epic Struggle To Determine A True and Accurate Year”, ISBN 0-385-79324-5, 1999.

[4] R. Hennacy, K. Hennacy, “A simple Gregorian calendar algorithm based upon single-digit numbers”, University of Maryland, 3257 A.V. Williams Bldg., Computer Science Department, College Park, MD 20742, 2005.

[5] Zeller, "Problema duplex Calendarii fundamentale", *Bulletin de la Société Mathématique de France* **11**: 59–61. ,1883.

[7] Java™, “Class Gregorian Calendar”, 2 Platform, std. Ed. V.1.4.2, Sun Microsystem, Inc, http://java.sun.com, 2003.

[8] الشيخ محمد باقر المجلسي، "بحار الأنوار الجامعة لدرر اخبار الأئمة الأطهار"، المجلّد الثامن، الباب الثالث، صفحة 143، الأميره للطباعة والنشر، بيروت، لبنان، 2008.

قــاعــدة جــديــدة لــتــصــمــيــم تــقــويــم مــيــلادي ابــدي

هشام صالح رضا

قسم علوم الحاسبات ، كلية التربية، جامعة البصرة

zrazan@yahoo.com

الخلاصة

التقويم الميلادي هو تقويم مسيحي غير مستقر متعرض الى تدخلات السلطات البابوية. من الناحية العملية، ان جيليه لايمكن ربطهما مع بعضهما البعض. بالتأكيد، ان التقويم الجيورجي لايمكن الرجوع به الى الوراء من تاريخ اعداده الى بداية عهد الميلاد ولا حتى الى عهد ما قبل الميلاد ؛ كذلك الحال في التقويم الجولياني الذي لايمكن الأمتداد به الى الأمام بعد تاريخ انتهاء العمل به؛ بالرغم من اعتماده في بعض الدول لغاية بداية القرن التاسع عشر. بالتالي، يمكن الجزم بصعوبة احراز طريقة صارمه تحاكي عصور التقويم الميلادي . في هذه الدراسة تم اعداد جيل جديد للتقويم الميلادي. عند اختيار يوم "الأحد" ليكون هو يوم ولادة السيد المسيح يعيد للحياة نظرية "ديونيسيوس" لحساب التقويم الميلادي وبالتالي تعطي البداية الصحيحه للعهد المسيحي والذي اسميناه (يوم نقطة الأنطلاق). ومن ناحية اخرى، اضاءت بديهيات معرفة اليوم الأول والأخير لأي متسلسلة من السنين في وضع الخطوط العريضة لتصميم خوارزمية ممكن تعقبها ببساطة لأستعراض تقويم ميلادي غير محدود. بالأستناد الى طريقة تحليلنا للمسألة، نتوقع لخوارزميتنا ان تعتبر كطريقة لم يسبق لها مثيل يمكن استخدامها لأنجاز الحسابات التقويمية المختلفة لعصور ماقبل الميلاد وما بعده.