Convert India Industrial Production (IIP) Dates to Vedic Calendar Dates

Required packages

```
library(VedicDateTime)
library(seasonal)
library(zoo)
```

Convert Gregorian dates of India Industrial Production (IIP) Dates to Vedic Calendar Dates:

Step 1: View India Industrial Production (IIP) Dates (available through `seasonal` package).

```
industrial_prod <- window(seasonal::iip, start = 2000)
industrial_prod
```

```
##           Jan      Feb      Mar      Apr      May      Jun      Jul      Aug
## 2005                                99.0838 103.0900 103.9666 102.4425 104.1004
## 2006 118.4664 112.4255 126.7159 108.8396 114.8274 114.2126 117.6044 114.2655
## 2007 134.8564 127.8147 144.8739 128.2021 136.8587 136.7408 136.6459 134.5998
## 2008 152.5200 149.3196 161.8845 142.3296 146.7452 148.3757 144.2976 141.8657
## 2009 144.3709 138.5057 153.5340 139.5905 144.2723 145.7417 146.7192 149.4225
## 2010 163.6191 157.5185 176.4743 157.8465 156.5436 156.5543 161.3000 156.1000
## 2011 175.9000 168.0000 193.1000 166.2000 166.2000 171.4000 167.2000 161.4000
## 2012 177.6000 175.2000 187.6000 164.1000 170.3000 168.0000 167.1000 164.7000
## 2013 182.0000 176.2000 194.2000 166.5000 166.0000 164.9000 171.4000 165.4000
## 2014 184.0000 172.7000 193.3000 172.7000 175.3000 172.0000 173.0000 166.2000
##           Sep      Oct      Nov      Dec
## 2005 104.4108 107.3272 104.6366 116.8191
## 2006 118.1773 117.6792 125.5368 132.7696
## 2007 133.9824 140.7213 137.9242 150.7315
## 2008 148.5866 146.1718 139.6522 148.2840
## 2009 151.0090 149.6481 148.4985 162.3779
## 2010 160.3000 166.6000 158.0000 175.6000
## 2011 164.3000 158.3000 167.5000 180.3000
## 2012 163.1000 171.6000 165.8000 179.3000
## 2013 167.5000 169.6000 163.6000 179.5000
## 2014 172.2000 162.5000 169.8000
```

```
iip_data <- data.frame(Y=as.matrix(seasonal::iip), date=as.Date(zoo::as.yearmon(time(seasonal::iip))))
iip_data
```

```
##            Y       date
## 1    99.0838 2005-04-01
## 2   103.0900 2005-05-01
## 3   103.9666 2005-06-01
## 4   102.4425 2005-07-01
## 5   104.1004 2005-08-01
```

```
## 6   104.4108 2005-09-01
## 7   107.3272 2005-10-01
## 8   104.6366 2005-11-01
## 9   116.8191 2005-12-01
## 10  118.4664 2006-01-01
## 11  112.4255 2006-02-01
## 12  126.7159 2006-03-01
## 13  108.8396 2006-04-01
## 14  114.8274 2006-05-01
## 15  114.2126 2006-06-01
## 16  117.6044 2006-07-01
## 17  114.2655 2006-08-01
## 18  118.1773 2006-09-01
## 19  117.6792 2006-10-01
## 20  125.5368 2006-11-01
## 21  132.7696 2006-12-01
## 22  134.8564 2007-01-01
## 23  127.8147 2007-02-01
## 24  144.8739 2007-03-01
## 25  128.2021 2007-04-01
## 26  136.8587 2007-05-01
## 27  136.7408 2007-06-01
## 28  136.6459 2007-07-01
## 29  134.5998 2007-08-01
## 30  133.9824 2007-09-01
## 31  140.7213 2007-10-01
## 32  137.9242 2007-11-01
## 33  150.7315 2007-12-01
## 34  152.5200 2008-01-01
## 35  149.3196 2008-02-01
## 36  161.8845 2008-03-01
## 37  142.3296 2008-04-01
## 38  146.7452 2008-05-01
## 39  148.3757 2008-06-01
## 40  144.2976 2008-07-01
## 41  141.8657 2008-08-01
## 42  148.5866 2008-09-01
## 43  146.1718 2008-10-01
## 44  139.6522 2008-11-01
## 45  148.2840 2008-12-01
## 46  144.3709 2009-01-01
## 47  138.5057 2009-02-01
## 48  153.5340 2009-03-01
## 49  139.5905 2009-04-01
## 50  144.2723 2009-05-01
## 51  145.7417 2009-06-01
## 52  146.7192 2009-07-01
## 53  149.4225 2009-08-01
## 54  151.0090 2009-09-01
## 55  149.6481 2009-10-01
## 56  148.4985 2009-11-01
## 57  162.3779 2009-12-01
## 58  163.6191 2010-01-01
## 59  157.5185 2010-02-01
```

```
## 60  176.4743 2010-03-01
## 61  157.8465 2010-04-01
## 62  156.5436 2010-05-01
## 63  156.5543 2010-06-01
## 64  161.3000 2010-07-01
## 65  156.1000 2010-08-01
## 66  160.3000 2010-09-01
## 67  166.6000 2010-10-01
## 68  158.0000 2010-11-01
## 69  175.6000 2010-12-01
## 70  175.9000 2011-01-01
## 71  168.0000 2011-02-01
## 72  193.1000 2011-03-01
## 73  166.2000 2011-04-01
## 74  166.2000 2011-05-01
## 75  171.4000 2011-06-01
## 76  167.2000 2011-07-01
## 77  161.4000 2011-08-01
## 78  164.3000 2011-09-01
## 79  158.3000 2011-10-01
## 80  167.5000 2011-11-01
## 81  180.3000 2011-12-01
## 82  177.6000 2012-01-01
## 83  175.2000 2012-02-01
## 84  187.6000 2012-03-01
## 85  164.1000 2012-04-01
## 86  170.3000 2012-05-01
## 87  168.0000 2012-06-01
## 88  167.1000 2012-07-01
## 89  164.7000 2012-08-01
## 90  163.1000 2012-09-01
## 91  171.6000 2012-10-01
## 92  165.8000 2012-11-01
## 93  179.3000 2012-12-01
## 94  182.0000 2013-01-01
## 95  176.2000 2013-02-01
## 96  194.2000 2013-03-01
## 97  166.5000 2013-04-01
## 98  166.0000 2013-05-01
## 99  164.9000 2013-06-01
## 100 171.4000 2013-07-01
## 101 165.4000 2013-08-01
## 102 167.5000 2013-09-01
## 103 169.6000 2013-10-01
## 104 163.6000 2013-11-01
## 105 179.5000 2013-12-01
## 106 184.0000 2014-01-01
## 107 172.7000 2014-02-01
## 108 193.3000 2014-03-01
## 109 172.7000 2014-04-01
## 110 175.3000 2014-05-01
## 111 172.0000 2014-06-01
## 112 173.0000 2014-07-01
## 113 166.2000 2014-08-01
```

```
## 114 172.2000 2014-09-01
## 115 162.5000 2014-10-01
## 116 169.8000 2014-11-01
```

Step 2: First, convert Gregorian dates of India Industrial Production (IIP) Dates to Julian dates.

```
get_vedic_date<- function(julian_day, place) {

masa_num <- VedicDateTime::masa(julian_day, place)
vikram_samvatsara = VedicDateTime::elapsed_year(julian_day, masa_num)[5]
tithi_ = tithi(julian_day, place)[1]
masa_ = masa(julian_day, place)[1]
vedic_dates = paste(as.character(vikram_samvatsara),"-",as.character(masa_),
                    "-",as.character(tithi_), sep = "")
return(vedic_dates)
}
```

```
date<- iip_data$date
date <- as.POSIXct.Date(date)
julianday_iip <- insol::JD(date)
julianday_iip
```

```
##   [1] 2453462 2453492 2453523 2453553 2453584 2453615 2453645 2453676 2453706
##  [10] 2453737 2453768 2453796 2453827 2453857 2453888 2453918 2453949 2453980
##  [19] 2454010 2454041 2454071 2454102 2454133 2454161 2454192 2454222 2454253
##  [28] 2454283 2454314 2454345 2454375 2454406 2454436 2454467 2454498 2454527
##  [37] 2454558 2454588 2454619 2454649 2454680 2454711 2454741 2454772 2454802
##  [46] 2454833 2454864 2454892 2454923 2454953 2454984 2455014 2455045 2455076
##  [55] 2455106 2455137 2455167 2455198 2455229 2455257 2455288 2455318 2455349
##  [64] 2455379 2455410 2455441 2455471 2455502 2455532 2455563 2455594 2455622
##  [73] 2455653 2455683 2455714 2455744 2455775 2455806 2455836 2455867 2455897
##  [82] 2455928 2455959 2455988 2456019 2456049 2456080 2456110 2456141 2456172
##  [91] 2456202 2456233 2456263 2456294 2456325 2456353 2456384 2456414 2456445
## [100] 2456475 2456506 2456537 2456567 2456598 2456628 2456659 2456690 2456718
## [109] 2456749 2456779 2456810 2456840 2456871 2456902 2456932 2456963
```

Step 3: Select the desired location for the date conversion.

```
place <- c(15.34, 75.13, +5.5) #Latitude, Longitude and timezone of the location
iip_vedic_calendar = c()
for (i in 1:length(julianday_iip))
{
iip_vedic_calendar = c(iip_vedic_calendar, get_vedic_date(julianday_iip[i], place))
}
iip_vedic_calendar
```

```
##   [1] "2061-12-22" "2062-1-23"  "2062-2-25"  "2062-3-25"  "2062-4-27"
##   [6] "2062-5-28"  "2062-6-28"  "2062-7-29"  "2062-8-30"  "2062-10-2"
##  [11] "2062-11-3"  "2062-12-2"  "2063-1-3"   "2063-2-4"   "2063-3-5"
##  [16] "2063-4-6"   "2063-5-7"   "2063-6-8"   "2063-7-9"   "2063-8-10"
##  [21] "2063-9-11"  "2063-10-13" "2063-11-14" "2063-12-13" "2064-1-14"
##  [26] "2064-2-14"  "2064-3-15"  "2064-3-16"  "2064-4-18"  "2064-5-20"
##  [31] "2064-6-20"  "2064-7-22"  "2064-8-23"  "2064-9-24"  "2064-10-25"
##  [36] "2064-11-24" "2064-12-25" "2065-1-25"  "2065-2-27"  "2065-3-28"
##  [41] "2065-4-30"  "2065-6-2"   "2065-7-2"   "2065-8-3"   "2065-9-4"
##  [46] "2065-10-5"  "2065-11-6"  "2065-12-5"  "2066-1-6"   "2066-2-7"
##  [51] "2066-3-9"   "2066-4-10"  "2066-5-11"  "2066-6-12"  "2066-7-12"
```

```
##  [56] "2066-8-14"  "2066-9-14"  "2066-10-16" "2066-11-18" "2066-12-16"
##  [61] "2067-1-18"  "2067-2-18"  "2067-2-19"  "2067-3-20"  "2067-4-21"
##  [66] "2067-5-22"  "2067-6-23"  "2067-7-25"  "2067-8-25"  "2067-9-27"
##  [71] "2067-10-29" "2067-11-27" "2067-12-28" "2068-1-28"  "2068-2-30"
##  [76] "2068-3-30"  "2068-5-2"   "2068-6-4"   "2068-7-5"   "2068-8-6"
##  [81] "2068-9-7"   "2068-10-8"  "2068-11-9"  "2068-12-8"  "2069-1-9"
##  [86] "2069-2-10"  "2069-3-11"  "2069-4-12"  "2069-5-14"  "2069-6-16"
##  [91] "2069-6-16"  "2069-7-18"  "2069-8-18"  "2069-9-19"  "2069-10-20"
##  [96] "2069-11-19" "2069-12-21" "2070-1-21"  "2070-2-23"  "2070-3-24"
## [101] "2070-4-25"  "2070-5-26"  "2070-6-27"  "2070-7-28"  "2070-8-28"
## [106] "2070-9-30"  "2070-11-2"  "2070-11-30" "2071-1-2"   "2071-2-2"
## [111] "2071-3-4"   "2071-4-4"   "2071-5-5"   "2071-6-7"   "2071-7-7"
## [116] "2071-8-9"
```

Step 4: Convert Julaian dates to Vedic calendar dates.

```
iip_data$date <- iip_vedic_calendar
iip_data
```

```
##            Y       date
## 1    99.0838 2061-12-22
## 2   103.0900  2062-1-23
## 3   103.9666  2062-2-25
## 4   102.4425  2062-3-25
## 5   104.1004  2062-4-27
## 6   104.4108  2062-5-28
## 7   107.3272  2062-6-28
## 8   104.6366  2062-7-29
## 9   116.8191  2062-8-30
## 10  118.4664  2062-10-2
## 11  112.4255  2062-11-3
## 12  126.7159  2062-12-2
## 13  108.8396   2063-1-3
## 14  114.8274   2063-2-4
## 15  114.2126   2063-3-5
## 16  117.6044   2063-4-6
## 17  114.2655   2063-5-7
## 18  118.1773   2063-6-8
## 19  117.6792   2063-7-9
## 20  125.5368  2063-8-10
## 21  132.7696  2063-9-11
## 22  134.8564 2063-10-13
## 23  127.8147 2063-11-14
## 24  144.8739 2063-12-13
## 25  128.2021  2064-1-14
## 26  136.8587  2064-2-14
## 27  136.7408  2064-3-15
## 28  136.6459  2064-3-16
## 29  134.5998  2064-4-18
## 30  133.9824  2064-5-20
## 31  140.7213  2064-6-20
## 32  137.9242  2064-7-22
## 33  150.7315  2064-8-23
## 34  152.5200  2064-9-24
## 35  149.3196 2064-10-25
```

```
## 36  161.8845 2064-11-24
## 37  142.3296 2064-12-25
## 38  146.7452  2065-1-25
## 39  148.3757  2065-2-27
## 40  144.2976  2065-3-28
## 41  141.8657  2065-4-30
## 42  148.5866   2065-6-2
## 43  146.1718   2065-7-2
## 44  139.6522   2065-8-3
## 45  148.2840   2065-9-4
## 46  144.3709  2065-10-5
## 47  138.5057  2065-11-6
## 48  153.5340  2065-12-5
## 49  139.5905   2066-1-6
## 50  144.2723   2066-2-7
## 51  145.7417   2066-3-9
## 52  146.7192  2066-4-10
## 53  149.4225  2066-5-11
## 54  151.0090  2066-6-12
## 55  149.6481  2066-7-12
## 56  148.4985  2066-8-14
## 57  162.3779  2066-9-14
## 58  163.6191 2066-10-16
## 59  157.5185 2066-11-18
## 60  176.4743 2066-12-16
## 61  157.8465  2067-1-18
## 62  156.5436  2067-2-18
## 63  156.5543  2067-2-19
## 64  161.3000  2067-3-20
## 65  156.1000  2067-4-21
## 66  160.3000  2067-5-22
## 67  166.6000  2067-6-23
## 68  158.0000  2067-7-25
## 69  175.6000  2067-8-25
## 70  175.9000  2067-9-27
## 71  168.0000 2067-10-29
## 72  193.1000 2067-11-27
## 73  166.2000 2067-12-28
## 74  166.2000  2068-1-28
## 75  171.4000  2068-2-30
## 76  167.2000  2068-3-30
## 77  161.4000   2068-5-2
## 78  164.3000   2068-6-4
## 79  158.3000   2068-7-5
## 80  167.5000   2068-8-6
## 81  180.3000   2068-9-7
## 82  177.6000  2068-10-8
## 83  175.2000  2068-11-9
## 84  187.6000  2068-12-8
## 85  164.1000   2069-1-9
## 86  170.3000  2069-2-10
## 87  168.0000  2069-3-11
## 88  167.1000  2069-4-12
## 89  164.7000  2069-5-14
```

```
## 90  163.1000  2069-6-16
## 91  171.6000  2069-6-16
## 92  165.8000  2069-7-18
## 93  179.3000  2069-8-18
## 94  182.0000  2069-9-19
## 95  176.2000 2069-10-20
## 96  194.2000 2069-11-19
## 97  166.5000 2069-12-21
## 98  166.0000  2070-1-21
## 99  164.9000  2070-2-23
## 100 171.4000  2070-3-24
## 101 165.4000  2070-4-25
## 102 167.5000  2070-5-26
## 103 169.6000  2070-6-27
## 104 163.6000  2070-7-28
## 105 179.5000  2070-8-28
## 106 184.0000  2070-9-30
## 107 172.7000  2070-11-2
## 108 193.3000 2070-11-30
## 109 172.7000   2071-1-2
## 110 175.3000   2071-2-2
## 111 172.0000   2071-3-4
## 112 173.0000   2071-4-4
## 113 166.2000   2071-5-5
## 114 172.2000   2071-6-7
## 115 162.5000   2071-7-7
## 116 169.8000   2071-8-9
```

```
iip_vedic_date_ts <- ts(iip_data$Y,start=c(2061,2))
```