Periodic table of Prime number intervals

Annotation

In accordance with the General Theory Systems of Urmantsev (GTSU) [1, 2, 3], the set of primes is considered as a system of objects. For the relationship between objects taken the difference of prime numbers. Revealed periodicity of pairs of intervals.

Keywords

Introduction

"An object — any material or ideal nature - a thought subject (for example, the biosphere or conclusion); and not only things, but also properties and relations: quantity and quality, preservation and change, substance and phenomenon (for example, interaction and friendship, conductivity and drought resistance, humour and satire...).

   Object system is the unity constructed on the relations (in that specific case - to interactions of r of a set {Ros} to the conditions limiting these relations — to laws of composition - z of a set {Zos} from "primary" elements m of a set {Mos (0)} allocated on the bases and sets {Aos(0)} from U universum. At the same time sets {Zos}; {Zos} and {Ros}; {Zos} and {Ros) and {Aos} can be empty or contain one, two..., the infinite number of identical or different elekment." [2].

"The system of objects of given — they are sorts - it is, in effect the system of objects systems of the same sort. And the words of "the same or this sort" mean that each of objects. systems has the common patrimonial signs (the same quality) — each of them is constructed of all or a part of primary elements of m of a set {Mi (0)} according to a part or all relations of r of a set {Ri}, with the part or all laws of composition of z of a set {Zi} realized on the considered system of objects of this sort. As well as for an object system, for the system of objects of this sort of a set {Z}; {Z} and {R}; {Z} and {R) and {A} (in this case — {Mi (0)}) can be empty or contain one, two..., the infinite number of elekment.

  Example of system of objects of this sort — the Periodic Table" [2].

"It is necessary to try to reveal the studied objects as objects systems and it is simultaneous, without being afraid of any charges, safely to build the systems of objects of the same sort. Results of similar approach more than will pay back the spent work." [2].

1. set of chemical elements as system of objects

 We will take atomic weight for the relation between objects. Let's construct the schedule, Figure 1.
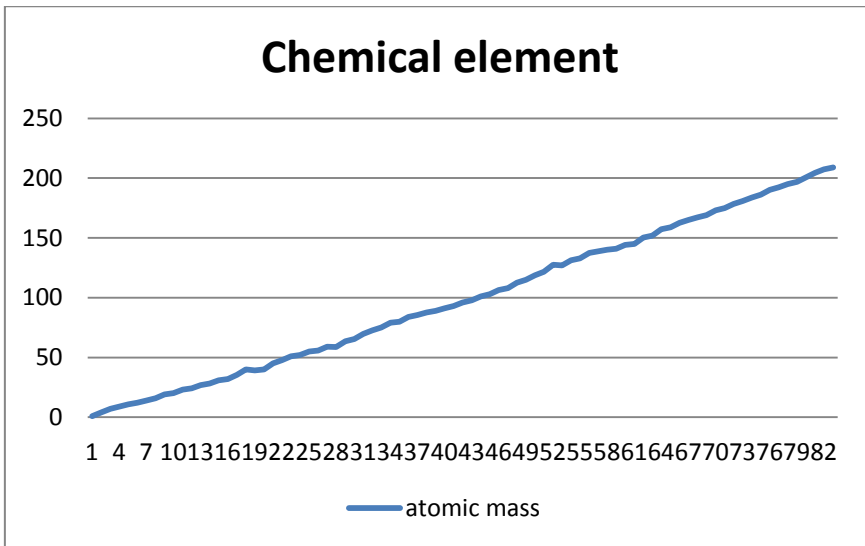
Figure 1

Here only the linear regularity is observed. Let's add graphics of molar volumes and atomic radiuses, Figure 2. We see some frequency. Other properties of chemical elements on schedules are difficult observed. And only when D.I. Mendeleyev presented a number of chemical elements in the table form, the set of other relations came to light." More than 160 versions of the table of the Periodic Table, first of which were constructed by D.I. Mendeleyev" [2].
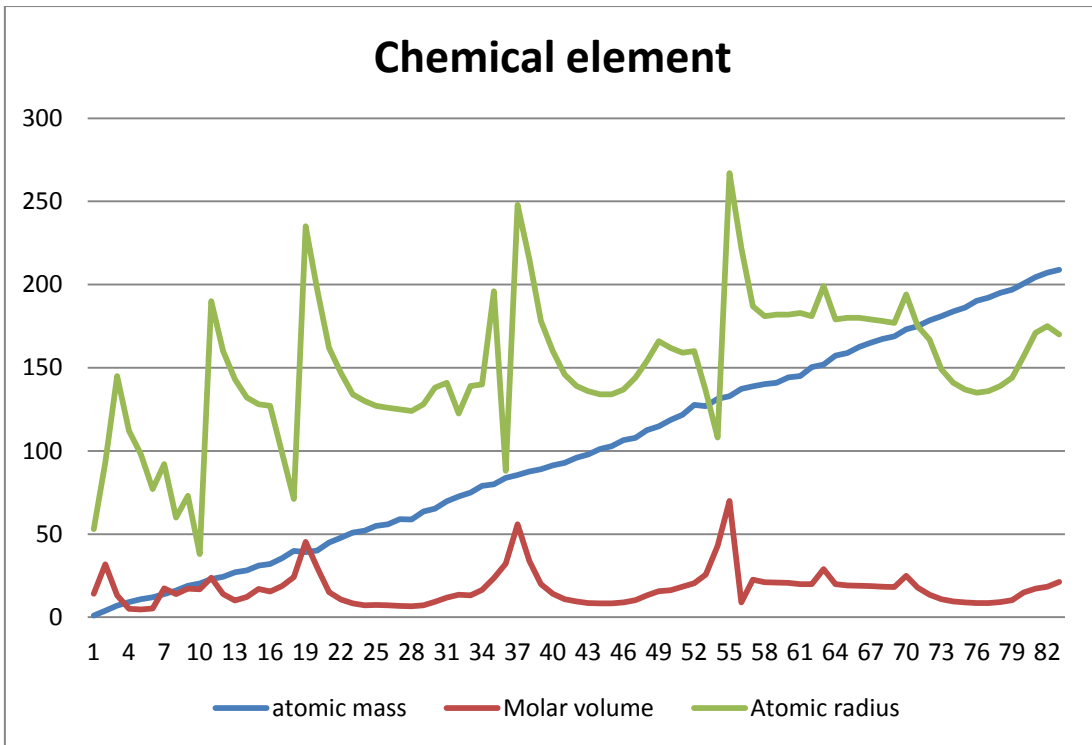

Figure 2

2. set of prime numbers as system of objects

We will take the difference of prime numbers for the relation between objects.

To each prime number we put three parameters in compliance. The first and second are the difference of this number with two near prime numbers. The third parameter is number of emergence of a combination of the first and second parameter among. We find a maximum (Imax) from the first and second parameters. We create the table the size (Imax * Imax). We complete the table the third parameter according to the first and second parameters, i.e. the first parameter is the line number, the second number of a column.

In the table frequency of filling is observed. In lines and columns every third waste of time.

We receive combinations of the first and second parameters two options.

 1 option - the first parameter is the difference of this prime number with the previous prime number, the second parameter is the difference of the following prime number with this prime number, table 1. Here a set of prime numbers to 32000.

0	1	2	3	4	5	6	7	8	9	10	11	12
1	0	120	97	0	103	67	0	33	23	0	14	8
2	118	0	148	65	0	33	47	0	22	28	0	7
3	102	127	143	86	58	75	42	21	31	21	22	7
4	0	61	77	0	49	28	0	18	21	0	16	5
5	95	0	62	54	0	41	27	0	13	8	0	4
6	61	39	79	26	28	31	19	10	25	2	5	6
7	0	53	42	0	24	12	0	14	5	0	4	2
8	30	0	24	16	0	15	15	0	3	4	0	0
9	30	32	23	12	27	15	4	5	5	1	1	4
10	0	24	11	0	15	5	0	7	0	0	5	1
11	22	0	21	12	0	7	2	0	5	0	0	0
12	4	10	10	1	4	5	1	2	3	3	1	1

Table 1

Here only the right upper of tables of intervals is shown. Completely tables for this row have the size 35 x 35.

2 option – couples of differences of prime numbers, table 2 undertake sequentially.

	0	1	2	3	4	5	6	7	8	9	10	11	12
1		0	57	54	0	47	37	0	16	13	0	6	6
2		54	0	75	36	0	18	28	0	10	14	0	1
3		50	63	71	42	25	35	19	13	12	8	14	5
4		0	34	37	0	23	15	0	8	8	0	6	1
5		48	0	41	30	0	18	15	0	5	3	0	3
6		27	20	41	14	9	17	12	6	14	1	2	2
7		0	24	18	0	10	5	0	4	3	0	2	2
8		17	0	11	7	0	5	12	0	3	1	0	0
9		16	15	12	7	17	6	1	2	2	0	1	3
10		0	10	6	0	12	3	0	5	0	0	3	1
11		11	0	11	6	0	3	0	0	3	0	0	0
12		3	7	7	0	1	3	0	0	0	1	0	0

Table 2

Frequency in both options is identical.

Prime numbers with three parameters register in the primesInterval3.txt file.

Tables are displayed and register in the tabInterval1.txt and tabInterval2.txt files.

The file of the text of the program and the executable file are on the GitHub web service [4].

The program is written on With ++.

Conclusion

In GTSU various options of the relations in the system of objects of this sort are removed. In this article only two options are mentioned.

Literature

1. Yu.A.Urmantsev, General Theory Systems (in Russian), Moskow, 1978
2. Yu.A.Urmantsev, General theory of systems about the relationship of interaction, unilateral action and interaction (in Russian), Moskow, 1978
3. Yu.A.Urmantsev, Symmetry of system and system of symmetry (in English) https://www.sciencedirect.com/science/article/pii/0898122186901604

4. GitHub: https://github.com/vstrim/Periodic-table-of-Prime-number-intervals