

### Практическое занятие 7.

1. Преобразовать систему уравнений к виду пригодному для итераций..  
Используя электронные таблицы EXCEL решить систему линейных уравнений методом простой итерации.

2. Разобраться в структуре приведенного макроса для решения системы.  
Использовать его для проверки полученного решения.

Номер варианта	Матрица системы				Правая часть
1	.4000	.0003	.0008	.0014	.1220
	-.0029	-.5000	-.0018	-.0012	-.2532
	-.0055	-.0050	-1.4000	-.0039	-.9876
	-.0082	-.0076	-.0070	-2.3000	-2.0812
2	1.7000	.0003	.0004	.0005	.6810
	.0000	.8000	.0001	.0002	.4803
	-.0003	-.0002	-.1000	.0000	-.0802
	-.0005	-.0004	-.0003	-1.0000	-1.0007
3	3.0000	.0038	.0049	.0059	1.5136
	.0011	2.1000	.0032	.0043	1.4782
	-.0005	.0005	1.2000	.0026	1.0830
	-.0022	-.0011	-.0001	.3000	.3280
4	4.3000	.0217	.0270	.0324	2.6632
	.0100	3.4000	.0207	.0260	2.7779
	.0037	.0090	2.5000	.0197	2.5330
	-.0027	.0027	.0080	1.6000	1.9285
5	5.6000	.0268	.0331	.0393	4.0316
	.0147	4.7000	.0271	.0334	4.3135
	.0087	.0150	3.8000	.0274	4.2353
	.0028	.0090	.0153	2.9000	3.7969
6	6.9000	.0319	.0390	.0461	5.6632
	.0191	6.0000	.0333	.0405	6.1119
	.0134	.0205	5.1000	.0348	6.2000
	.0077	.0149	.0220	4.2000	5.9275
7	8.2000	.0370	.0451	.0532	7.5591
	.0234	7.3000	.0396	.0477	8.1741
	.0179	.0260	6.4000	.0422	8.4281
	.0124	.0205	.0286	5.5000	8.3210
8	9.5000	.0422	.0513	.0604	9.7191
	.0278	8.6000	.0459	.0550	10.5000
	.0224	.0315	7.7000	.0496-	10.9195
	.0170	.0261	.0351	6.8000	10.9775
9	10.8000	.0475	.0576	.0676	12.1430
	.0321	9.9000	.0523	.0623	13.0897
	.0268	.0369	9.0000	.0570	13.6744

	.0215	.0316	.0416	8.1000	13.8972
10	12.1000	.0528	.0639	.0749	14.8310
	.0365	11.2000	.0586	.0697	15.9430
	.0312	.0423	10.3000	.0644	16.6926
	.0260	.0370	.0481	9.4000	17.0800
11	13.4000	.0581	.0702	.0822	17.7828
	.0408	12.5000	.0650	.0770	19.0599
	.0356	.0477	11.6000	.0718	19.9744
	.0304	.0425	.0546	10.7000	20.5261
12	14.7000	.0635	.0765	.0896	20.9985
	.0452	13.8000	.0714	.0844	22.4406
	.0400	.0531	12.9000	.0793	23.5195
	.0349	.0479	.0610	12.0000	24.2352
13	16.0000	.0688	.0829	.0970	24.4781
	.0496	15.1000	.0777	.0918	26.084
	.0444	.0585	14.2000	.0867	27.3281
	.0393	.0534	.0674	13.3000	28.2078
14	17.3000	.0741	.0892	.1043	28.2215
	.0539	16.4000	.0841	.0992	29.9928
	.0488	.0639	15.5000	.0941	31.4001
	.0437	.0588	.0739	14.6000	32.4435
15	23.8000	.1010	.1212	.1414	50.8968
	.0757	22.9000	.1161	.1363	53.4873
	.0707	.0909	22.0000	.1313	55.7118
	.0656	.0858	.1060	1.1000	57.5703
16	19.9000	.0849	.1020	.1191	36.5001
	.0626	19.0000	.0969	.1140	38.5997
	.0576	.0747	18.1000	.1090	40.3345
	.0525	.0696	.0867	17.2000	41.7045
17	21.2000	.0902	.1084	.1265	41.0351
	.0670	20.3000	.1033	.1215	41.2986
	.0619	.0801	19.4000	.1164	45.1968
	.0569	.0750	.0932	18.5000	46.7299
18	22.5000	.0956	.1148	.1339	45.8340
	.0714	21.6000	.1097	.1289	48.2611
	.0663	.0855	20.7000	.1238	50.3226
	.0612	.0804	.0996	19.8000	52.0184
19	23.8000	.1010	.1212	.1414	50.8968
	.0757	22.9000	.1161	.1363	53.4873
	.0707	.0909	22.0000	.1313	55.7118
	.0656	.0858	.1060	21.1000	57.5703
20	25.1000	.1063	.1276	.1488	56.2234
	.0801	24.2000	.1225	.1437	58.9772
	.0750	.0963	23.3000	.1387	61.3645
	.0700	.0912	.1124	22.4000	63.3853

21	26.4000	.1117	.1339	.1562	61.8139
	.0844	25.5000	.1289	.1512	64.7307
	.0794	.1017	24.6000	.1461	67.2806
	.0744	.0966	.1189	23.7000	69.4636
22	27.7000	.1171	.1403	.1636	67.6682
	.0888	26.8000	.1353	.1586	70.7478
	.0838	.1070	25.9000	.1536	73.4601
	.0788	.1020	.1253	25.0000	75.8051
23	29.0000	.1225	.1467	.1710	73.7864
	.0932	28.1000	.1417	.1660	77.0286
	.0882	.1124	27.2000	.1610	79.9030
	.0831	.1074	.1317	26.3000	82.4098
24	30.30000	0.1278	0.1531	0.1784	80.1684
	0.0975	29.4000	0.1481	0.1734	83.5730
	0.0925	0.1178	28.5000	0.1684	86.6095
	0.0873	0.1128	0.1381	27.6000	89.2778

**Макрос для решения системы уравнений методом простой итерации:**

```

Sub lin2()
n = Range("c2").Value
e = Range("c3").Value
Dim a(100, 100), b(100), X(100), z(100)
For i = 1 To n
For j = 1 To n
a(i, j) = Cells(i + 3, j + 1).Value
Next j
b(i) = Cells(i + 3, n + 2).Value
Next i

s = 0
For i = 1 To n:
z(i) = Cells(i + 3, 9).Value
Next i
100 K = 0
For i = 1 To n
X(i) = -b(i)

For j = 1 To n
X(i) = X(i) + a(i, j) * z(j)
Next j:
If Abs(X(i) / a(i, i)) >= e Then K = 1
X(i) = z(i) - X(i) / a(i, i)
Next i
For i = 1 To n: z(i) = X(i)
Next i

```

```
s = s + 1  
If K = 1 Then GoTo 100
```

```
For i = 1 To n  
Cells(i + 3, 7).Value = "x"  
Cells(i + 3, 8).Value = i  
Cells(i + 3, 9).Value = X(i)  
Next i  
Range("k4").Value = s  
End Sub
```

**Пример.**

Решить систему уравнений, матрица которой задана как

Матрица системы				Правая часть
0,4	0,0003	0,0008	0,0014	0,122
-0,0029	-0,5	-0,0018	-0,0012	-0,2532
-0,0055	-0,005	-1,4	-0,0039	-0,9876
-0,0082	-0,0076	-0,007	-2,3	-2,0812

Полученное решение:

x	1	0,300075
x	2	0,49998
x	3	0,699957
x	4	0,900018