

Brief description of program Diabet

Introduction (*Partially*)

The treatment of IDDM patients is still a very serious problem which has not been solved yet. One of the ways of overcoming this problem is to create and implant an artificial biosystem, replacing the endocrine part of the pancreatic gland, producing insulin, into the organism of a patient. The description of different types of such devices can be found for example in [1]. The works in this sphere have been carried out for a decade already and, though they have not reached a full success, a significant progress has been demonstrated concerning the extent of carbohydrate metabolism recovery and the length of these biosystems functioning. An example of an advanced development is a method of treating IDDM patients based on a transplanting a capsule, containing β - cells of a rabbit into the arterial vessel of a patient. This method is already used in clinics and shows good results. [12]. For its future improvement and establishing connection between the registered levels of glucose and different parameters of this capsule, we have elaborated a physico-mathematical model of the processes of insulin and glucose transfer in a capsule and a kinetic model of glucose level regulation in the organism of a patient with an implanted capsule. The aim of this work is the presentation of these models and some of the results of their application.

The main peculiarity of an artificial endocrine pancreatic biosystem described here an high level of oxygen consumption due to intensive vascularization of the capsule surface, and also high gradients of glucose and insulin concentration. In the supposition concerning the constancy of a capsule shape in conditions of a pulsatile blood flow and the existence of a pulse-wave in the vessel wall, the mass transfer of insulin and glucose inside the capsule is described by diffusion equations, which contain the functions of glucose drain and the sources of insulin (subindex s shall be glucose ($s = G$) and insulin ($s = I$)):

$$\frac{\partial C_s}{\partial t} = \frac{\partial}{\partial x} \left(D_s \frac{\partial C_s}{\partial x} \right) + \frac{\partial}{\partial y} \left(D_s \frac{\partial C_s}{\partial y} \right) + S_s, \quad (1)$$

$$C_s|_{\Gamma} = C_b, \quad D_s \frac{\partial C_s}{\partial n} |_{\Gamma-0} = K(C_s|_{\Gamma-0} - C_b), \quad (2)$$

$$C_s|_{t=0} = C_{s,0}, \quad (3)$$

$$S_G = -(R_1 + R_2)/\varepsilon, \quad S_I = R_s/\varepsilon \quad (4)$$

In general, we consider the shape of the capsule to be ellipsoidal with the equation of surface (fig. 1)

$$\left(\frac{x}{R_h} \right)^2 + \left(\frac{y}{R_w} \right)^2 = 1. \quad (5)$$

x shall be a transverse coordinate (R_h – a capsule thickness), and y – a coordinate, in the direction, vertical to x (R_w – a capsule width).

We shall neglect the diffusion mass transfer along the capsule, because its length $L=25$ mm is always much bigger than R_h and R_w . Under D_G and D_I we mean effective coefficients of glucose and insulin diffusion in a capsule and suppose, that they are connected with diffusion coefficients of these substances in a suspendable media (D_{Gf} и D_{If}) as follows

$$D_G = \frac{\varepsilon D_{Gf}}{\tau^2}, \quad D_I = \frac{\varepsilon D_{If}}{\tau^2}. \quad (6)$$

The tortuosity of mass transfer channels (a space free from cells, filled with liquid) is connected with porosity ε by the correlation

$$\tau = \frac{\tau_0}{1 - \varepsilon(1 - \tau_0)}. \quad (7)$$

Under the porosity of the system we mean a relative fraction of a capsule volume, free of cells. In this case, we do not differentiate intercellular surface and the surface, occupied by capillaries, moreover, it is supposed that there are no capillaries in the capsule yet. Thus $\varepsilon = 1 - v$.

The functions of glucose drain and insulin sources in (2) are described by correlations, proposed by Mac and Keiser [3]:

$$v \frac{\partial G_i}{\partial t} = R_1 + R_2 - R_m, \quad (8)$$

$$\frac{R_m}{v} = \frac{V_m G_i}{K_m + G_i}, \quad (9)$$

$$\frac{R_1}{v} = \frac{V_1(G - G_i)}{(K_1 + G_i)(1 + G/K_1)} \cdot \frac{I}{K_i + I}, \quad (10)$$

$$\frac{R_2}{v} = \frac{V_2(GJ^m - G_i)}{(K_2 + G_i)(1 + G/K_2)}, \quad (11)$$

$$R_s = \frac{V_s(R_m^4 + L^4)}{R_m^4 + K_s^4 + L^4}. \quad (12)$$

$$\tau_J \frac{dJ}{dt} = J_\infty - J, \quad (13)$$

$$J_\infty = K_{inh} / (K_{inh} + I), \quad (14)$$

where R_1 and R_2 are the speed of GLUT1 and GLUT2 glucose supply by the carriers; R_s – the speed of insulin secreting by albuminous cells, and v – volume fraction of cells in stream

Correlation (8) describes the kinetics of glucose metabolism in a cell. Symbol G_i stands for intercellular concentration of glucose. The speed of glucose metabolism R_m is the increasing function of this concentration and described by formula (9). Variable J characterizes the extent of insulin suppression of its own, i.e. takes into account the process of GLUT2 glucose carriers deactivation by the insulin outside the cell. The parameters of the model (1)-(14) are presented in table 1.

For the first time the task of insulin secretion in the system, which consists of a lot of bids, keeping β - and perfused cells by a glucose containing solution, was solved in [3]. Later, in work [2], the diffusive mechanism of insulin and glucose transfer in such a system was taken into account. Our setting of diffusion problem (1)-(13) has several essential differences from Kiner's model [2]. First of all, the porosity of system is obviously taken into account in formula (2), while in [2] this parameter is absent for some reason. Besides this, we took into account the factor of tortuosity τ^2 in formulas (6) for effective diffusion coefficients. In [2] it was not taken into account. Unlike in [2], we also as well as in [3] do not include an obvious volume fraction of cells into the function of insulin sources R_s , supposing it is already taken into account in R_m . Otherwise, even if formally there are no cells, producing this hormone, some significant sources of insulin arise.

In one-dimensional case, relating to the conditions of a laboratory unit i.e. placing the cylindrical capsule in the tube center, similar to (1)-(14) task was viewed by us in [10]. Setting of the task, viewed here, is closer to clinical settings of a capsule placement, as it is two-dimensional and has a more complex geometry of computational domain than in [2, 10].

Following description part can be provided by request

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Results (Partially)

The solution of kinetic equations system for the concentration of glucose and insulin in blood (15)-(20), and also for the concentration of glucose in β -cells and variable J (for each point inside a cell) was realized by means of Runge-Kutt's method with the choice of a time pace using Merson's method, in combination with Gir's method to reduce the count time. It was followed by solving the boundary problem (1)-(3) using a finite difference method with splitting along the axis of coordinates. The solution of the task was defined more precisely at several iterations at the stage of correction when realizing Gir's method, and also at external iteration process on each time layer. An indicative toughness (from mathematical point of view) and relatively small time steps (defined automatically in accordance with the set error threshold) should be noted. At the required accuracy at the level of 10^{-9} and the duration of a modelled process from 3 to 5 hours, the time step changed from 0.001 to 0.025 sec.....

Following description part can be provided by request

..... The offered mathematical model of glucose and insulin level kinetics in the organism of a IDDM patient describes the change of glucose concentration in the organism of a patient without a capsule with β -cells, after food intake and parenteral injection of insulin. The imitation of a capsule presence inside such a patient at a total refuse from exogenous injection of insulin, shows its ability to develop a significant amount of insulin and regulate glycemic status of a patient. The increase of blood viscosity has a negative effect on functional characteristics of a capsule. In order to improve these characteristics it is reasonable to use the capsules which will be as flat as possible. Survivability of β -cells is the most critical and vital parameter of a viewed artificial biosystem.

Software description.

Purpose: Simulation of carbohydrate metabolism of the patient with diabetes after transplantation of macrocapsule (capsule) with islet cells. Simulation of insulin kinetics is based on the models of Maki-Keizer and Keener, and (is) intended to assess the functional properties of the graft with the islet cells implanted in the vascularized area. Simulation solves the system of kinetic equations and diffusion equations for glucose and insulin, and calculates the amount of insulin extracted from such a implant, taking into account exogenous insulin delivery and nutrients (delivered with food).

User Interface - window. The program runs under Windows operating system.

Key features:

initial data input command **Open** from a previously saved data file;

changes to the source data in a special team **Edit** box;

start calculation on the **Run** command;

view results for the team **Results** (including during calculations);

saving of inputs and outputs in a tabular format command **Save**;

saving scheduling kinetics of insulin and glucose in the form of two bmp-files;

selecting one of the four figures: Insulin and Glucose Kinetics, Change rate of insulin and glucose concentrations, Mode of Insulin injection and glucose delivery, Capsule form (в том числе и во время самих вычислений);

closure of the program team **Close**.

Note: After the calculation is complete, the Run button will remain inactive until the **Save** command is entered! The data saving is not required.

Window for editing the source data contains 9 tables for filling (see Fig. Data Edit)

The screenshot shows the 'Data Edit' window with a warning message: "This program is for scientific use only and is NOT INTENDED TO PROVIDE PERSONAL MEDICAL ADVICE". The window is divided into several sections:

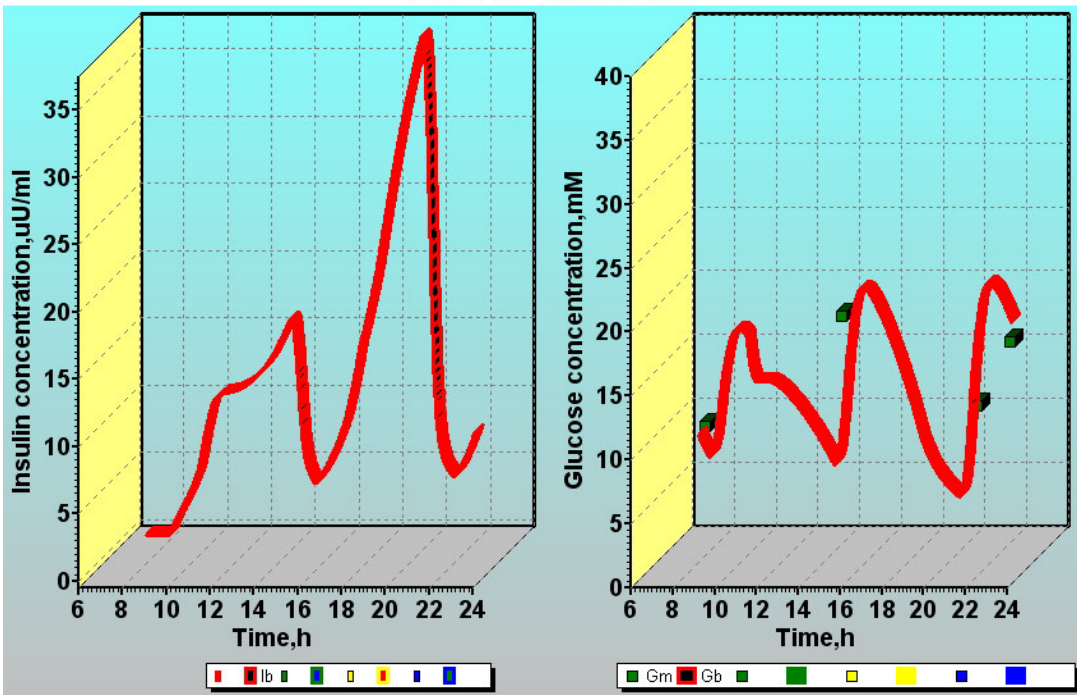
- Diet:** A table with columns for Time injection, Insulin (Dose, Mark, Injection site), Eating (Time, Breads Unit), and Glucose (Measure Time, Level).
- Patient parameters:** Fields for Age, Body mass, Height, Body temperature, Sex, and Disease.
- Keener' Model Parameters:** Fields for G0, K_{inh}, K_i, and K_m.
- Calculation Parameters:** Fields for Time of simulation start, Process duration, Nodes number along vessel radius, and Nodes number along capsule depth.
- Capsule Parameters:** Fields for Artery radius, Aneurysm radius, Width of capsule, and Depth of capsule.
- Shvitra' Model Parameters:** Two tables of parameters (a, a_{ad}, b, c, d, e, g, h, KG, KI, K_{la}, K_{ls} and K_a, K_d, r_G, r_l, r_{la}, r_{ls}, r_a, r_d, q_l, q_d, w, DELTA).

Buttons for 'OK', 'Default', and 'Cancel' are located at the bottom.

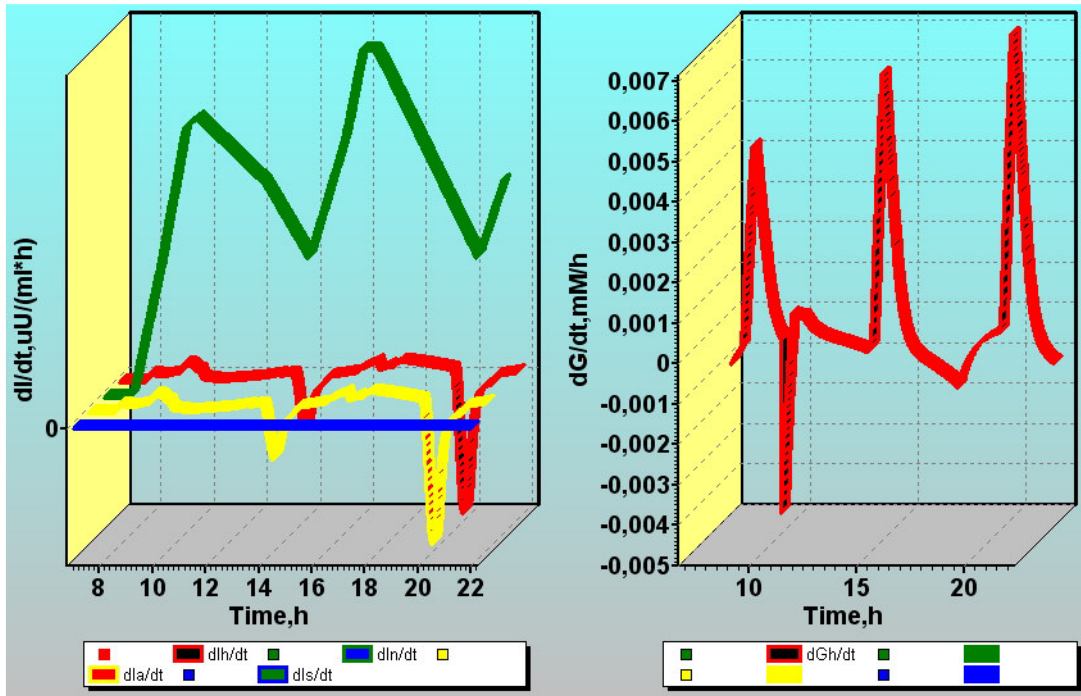
All tables are grouped by 8 categories: Insulin, Eating and Glucose relate to diet and contain measured values of glucose, the amount of grain eaten by the patient units, as well as time, dose and brand he introduced insulin. These parameters are necessary for calculating the kinetics of carbohydrate metabolism. Patient Parameters Table contains unused in this calculation parameters. Parameters in the table Capsule Parameters, and part of the parameters from Table Calculation Parameters used in the calculation, if the accounting is enabled diabetic capsules Ketkov beta-implanted into the femoral artery of the patient. Tables Keener 'Model Parameters and Shvitra Model Parameters contain parameters used in the simulation of carbohydrate metabolism and insulin kinetics of the Keener and Shvitra models.

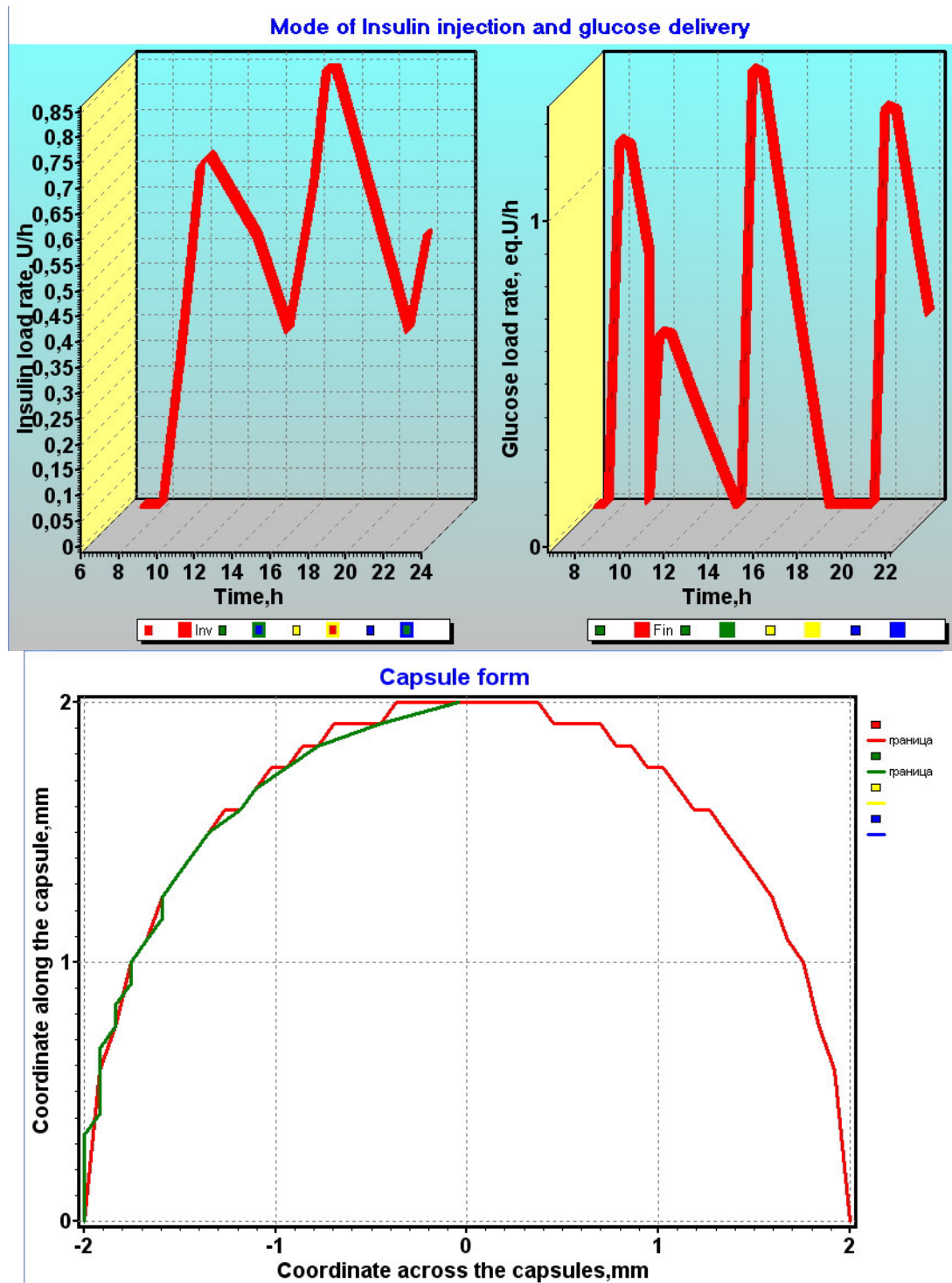
Example results graphically

Insulin and Glucose Kinetics



Change rate of insulin and glucose concentrations





The list of input and output parameters can be seen from the listing of results, as shown in the example. This listing can be obtained as output from the command Save the text file, and selecting and copying memory contents window ResultsView (Ctrl + A and Ctrl + C).

```

Program version: 1
Comments: This program is for scientific use only and is NOT INTENDED TO PROVIDE
PERSONAL MEDICAL ADVICE
Nodes number along vessel radius: 50
Nodes number along capsule depth: 50
Nodes number in blood flow: 20
Nodes number along capsule length: 100
Nodes number along vessel length: 200
Nodes number along capsule width: 25
ЧIteration number in Gir' method: 2

```

Relative error of calculations: 10
Time of simulation start,h: 7
Process duration,min: 900
Age,years: 13
Body mass, kg: 56
Height, cm: 166
Body temperature,"C: 36.6
Sex (0-male,1-female): 0
Disease: 0-no, 1-DM1, 2-DM2: 1
The presence of a capsule: 0-no,1-yes: 0
Part of non-working area,%: 10
Artery radius, mm: 2
Aneurysm radius, mm: 6
Width of capsule, mm: 2
Depth of capsule, mm: 2
Length of capsule, mm: 25
Length of aneurysm, mm: 60
Length of simulation area, mm: 100
Average of blood velocity, m/s: 1
Index flow for hemorheological model: 1
Blood consistence pdrimeter, sP: 3.5
Capsule porosity,%: 25
Volume part of beta-cells,%: 75
Part of living beta-cells,%: 100
Pores tortuosity: 1.5
Membrane permeability,1/um: 10
Constant B: 1
G0,mM: 1.5
K_{inh},nM: 1
K_i,nM: 40
K_m,mM: 9.8
K_s,mM/min: 0.13
K₁,mM: 1.4
K₂,mM: 17
L,mM/min: 0.01
tau_J,min: 20
V_m,mM/min: 0.24
V_s,mM/min: 0.034
V₁,mM/min: 120
V₂,mM/min: 32
Correction of the diffusion coefficients: 1
Insulin diffusivity in blood,cm²/s: 2.1
Glucose diffusivity in blood,cm²/s: 6.6
Initial concentration of insulin,uU/ml: 0
Initial concentration of glucose,mM: 8.4
Correction of broadening unit,mg%/mM: 14.4
a: 0.1
a_{ad}: 0.1
b: 0.3
c: 0.75
d: 0.4
e: 15
g: 0.35
h: 4
K_G: 250
K_I: 15
K_{Ia}: 7
K_{Is}: 7.5
K_a: 124
K_d: 100
r_G: 1.04
r_I: 0.32
r_{Ia}: 1.5
r_{Is}: 0.15
r_a: 0.01
r_d: 0.6

q_I: 6.5
 q_d: 3.5
 w: 3
 DELTA: 0.7
 Correction of coefficient Un5,uU/mole: 1
 Number of insulin injections: 5
 Time of insulin injection,h: 7 7.01 13.67 20.03 21.6
 Dose of insulin,U: 13 13 14 14 16
 Insulin mark: 0-AKTP,1-ΠPOT: 0 1 0 0 1
 Ijection site: 0-abdomen,1- clunis,2-arm,3-foot: 3 3 3 2 3
 Number of meals: 4
 Time of meals,h: 7.5 9.33 13.5 19.5
 Number eaten bread units: 6 3 8.5 9
 Number of measurements of blood sugar: 4
 Time of measurements of blood sugar,h: 7 13.5 20 21.57
 Level of blood sugar,mM: 8.4 17 10 15

Capsule thickness = 2.0 mm : Capsule width = 2.0 mm : Volume = 331.973 mm³ :
 Surface area = 287.299 mm²

Capsule presence: 0-NO,1-YES : 0
 Volume part of beta-cells,% =75.00
 Living part of beta-cells,% =100.00
 Pores tortuosity = 1.50
 Membranes permeability,1/um = 10
 Diffusivity correction factor = 1.0
 Correction factor for mU/mmmole (U5) = 1.0

h :min Ia,mU/l Gb,mM <Gb>	7:38	0.00	6.79	7.26	8:16	0.86	13.77	8.59			
7: 1	0.00	8.32	7.81	7:39	0.00	6.86	7.25	8:17	0.92	13.93	8.66
7: 2	0.00	8.25	7.85	7:40	0.00	6.93	7.24	8:18	0.98	14.08	8.73
7: 3	0.00	8.18	7.90	7:41	0.00	7.02	7.23	8:19	1.04	14.22	8.80
7: 4	0.00	8.11	7.96	7:42	0.00	7.12	7.23	8:20	1.10	14.37	8.87
7: 5	0.00	8.04	7.95	7:43	0.00	7.22	7.23	8:21	1.16	14.50	8.94
7: 6	0.00	7.98	7.96	7:44	0.00	7.34	7.23	8:22	1.21	14.64	9.00
7: 7	0.00	7.92	7.96	7:45	0.00	7.47	7.23	8:23	1.27	14.76	9.07
7: 8	0.00	7.85	7.92	7:46	0.00	7.61	7.24	8:24	1.32	14.89	9.14
7: 9	0.00	7.79	7.91	7:47	0.00	7.76	7.25	8:25	1.38	15.00	9.21
7:10	0.00	7.73	7.90	7:48	0.00	7.92	7.26	8:26	1.43	15.12	9.28
7:11	0.00	7.67	7.86	7:49	0.00	8.09	7.27	8:27	1.49	15.23	9.34
7:12	0.00	7.61	7.84	7:50	0.00	8.26	7.29	8:28	1.54	15.34	9.41
7:13	0.00	7.56	7.82	7:51	0.00	8.45	7.31	8:29	1.59	15.44	9.48
7:14	0.00	7.50	7.80	7:52	0.00	8.64	7.34	8:30	1.64	15.54	9.54
7:15	0.00	7.44	7.78	7:53	0.00	8.85	7.36	8:31	1.69	15.63	9.61
7:16	0.00	7.39	7.76	7:54	0.00	9.06	7.39	8:32	1.74	15.72	9.67
7:17	0.00	7.34	7.73	7:55	0.00	9.28	7.42	8:33	1.79	15.80	9.74
7:18	0.00	7.28	7.70	7:56	0.00	9.50	7.46	8:34	1.85	15.88	9.80
7:19	0.00	7.23	7.68	7:57	0.00	9.74	7.50	8:35	1.90	15.95	9.87
7:20	0.00	7.18	7.66	7:58	0.00	9.99	7.53	8:36	1.95	16.02	9.93
7:21	0.00	7.13	7.63	7:59	0.00	10.23	7.58	8:37	2.00	16.08	9.99
7:22	0.00	7.08	7.61	8: 0	0.00	10.49	7.62	8:38	2.05	16.14	10.06
7:23	0.00	7.03	7.58	8: 1	0.01	10.74	7.67	8:39	2.10	16.19	10.12
7:24	0.00	6.98	7.56	8: 2	0.04	10.98	7.72	8:40	2.15	16.24	10.18
7:25	0.00	6.94	7.54	8: 3	0.08	11.22	7.78	8:41	2.20	16.29	10.24
7:26	0.00	6.89	7.51	8: 4	0.12	11.45	7.83	8:42	2.26	16.33	10.30
7:27	0.00	6.84	7.48	8: 5	0.18	11.68	7.89	8:43	2.31	16.37	10.36
7:28	0.00	6.80	7.46	8: 6	0.23	11.90	7.95	8:44	2.36	16.40	10.41
7:29	0.00	6.76	7.44	8: 7	0.29	12.11	8.01	8:45	2.41	16.44	10.47
7:30	0.00	6.71	7.41	8: 8	0.36	12.32	8.07	8:46	2.47	16.46	10.53
7:31	0.00	6.68	7.39	8: 9	0.42	12.52	8.13	8:47	2.52	16.49	10.58
7:32	0.00	6.66	7.37	8:10	0.48	12.72	8.20	8:48	2.57	16.51	10.64
7:33	0.00	6.65	7.35	8:11	0.55	12.91	8.26	8:49	2.63	16.53	10.69
7:34	0.00	6.65	7.33	8:12	0.61	13.09	8.33	8:50	2.68	16.55	10.74
7:35	0.00	6.67	7.31	8:13	0.68	13.27	8.39	8:51	2.74	16.56	10.80
7:36	0.00	6.70	7.29	8:14	0.74	13.44	8.46	8:52	2.79	16.57	10.85
7:37	0.00	6.74	7.27	8:15	0.80	13.61	8.53	8:53	2.85	16.58	10.90

8:54	2.90	16.58	10.95	10: 0	9.68	12.52	12.25	11: 6	10.74	11.79	12.27
8:55	2.96	16.59	11.00	10: 1	9.76	12.52	12.25	11: 7	10.75	11.77	12.27
8:56	3.01	16.59	11.05	10: 2	9.82	12.52	12.25	11: 8	10.76	11.74	12.27
8:57	3.07	16.59	11.09	10: 3	9.88	12.52	12.25	11: 9	10.77	11.71	12.27
8:58	3.13	16.58	11.14	10: 4	9.93	12.53	12.26	11:10	10.78	11.68	12.26
8:59	3.19	16.58	11.18	10: 5	9.97	12.53	12.26	11:11	10.80	11.66	12.26
9: 0	3.25	16.57	11.23	10: 6	10.01	12.53	12.26	11:12	10.81	11.63	12.26
9: 1	3.30	16.56	11.27	10: 7	10.04	12.53	12.26	11:13	10.82	11.60	12.26
9: 2	3.37	16.55	11.32	10: 8	10.07	12.53	12.26	11:14	10.83	11.57	12.25
9: 3	3.43	16.54	11.36	10: 9	10.09	12.53	12.26	11:15	10.85	11.54	12.25
9: 4	3.50	16.52	11.40	10:10	10.12	12.53	12.26	11:16	10.86	11.52	12.25
9: 5	3.56	16.51	11.44	10:11	10.14	12.53	12.27	11:17	10.87	11.49	12.25
9: 6	3.63	16.49	11.48	10:12	10.16	12.53	12.27	11:18	10.89	11.46	12.24
9: 7	3.70	16.47	11.52	10:13	10.19	12.53	12.27	11:19	10.90	11.43	12.24
9: 8	3.77	16.45	11.56	10:14	10.21	12.53	12.27	11:20	10.91	11.40	12.24
9: 9	3.84	16.43	11.60	10:15	10.22	12.53	12.27	11:21	10.93	11.37	12.23
9:10	3.92	16.41	11.63	10:16	10.24	12.53	12.27	11:22	10.94	11.34	12.23
9:11	3.99	16.38	11.67	10:17	10.26	12.53	12.27	11:23	10.96	11.31	12.23
9:12	4.06	16.36	11.70	10:18	10.28	12.53	12.27	11:24	10.97	11.28	12.22
9:13	4.14	16.33	11.74	10:19	10.30	12.53	12.27	11:25	10.99	11.25	12.22
9:14	4.21	16.31	11.77	10:20	10.32	12.53	12.28	11:26	11.00	11.22	12.22
9:15	4.29	16.28	11.81	10:21	10.33	12.53	12.28	11:27	11.02	11.18	12.21
9:16	4.36	16.25	11.84	10:22	10.35	12.53	12.28	11:28	11.04	11.15	12.21
9:17	4.44	16.22	11.87	10:23	10.37	12.53	12.28	11:29	11.05	11.12	12.20
9:18	4.52	16.19	11.90	10:24	10.39	12.53	12.28	11:30	11.07	11.09	12.20
9:19	4.59	16.15	11.93	10:25	10.41	12.52	12.28	11:31	11.09	11.06	12.20
9:20	4.68	15.97	11.96	10:26	10.43	12.51	12.28	11:32	11.10	11.02	12.19
9:21	4.77	15.68	11.99	10:27	10.45	12.51	12.28	11:33	11.12	10.99	12.19
9:22	4.89	15.42	12.01	10:28	10.47	12.50	12.29	11:34	11.14	10.96	12.18
9:23	5.01	15.17	12.04	10:29	10.49	12.49	12.29	11:35	11.16	10.93	12.18
9:24	5.15	14.93	12.06	10:30	10.51	12.48	12.29	11:36	11.18	10.89	12.17
9:25	5.28	14.71	12.08	10:31	10.53	12.47	12.29	11:37	11.20	10.86	12.17
9:26	5.43	14.50	12.09	10:32	10.54	12.46	12.29	11:38	11.22	10.83	12.16
9:27	5.57	14.31	12.11	10:33	10.55	12.45	12.29	11:39	11.23	10.79	12.16
9:28	5.72	14.12	12.12	10:34	10.56	12.44	12.29	11:40	11.25	10.76	12.15
9:29	5.87	13.95	12.14	10:35	10.57	12.43	12.29	11:41	11.27	10.73	12.15
9:30	6.02	13.79	12.15	10:36	10.57	12.41	12.29	11:42	11.29	10.69	12.14
9:31	6.17	13.64	12.16	10:37	10.58	12.40	12.29	11:43	11.31	10.66	12.14
9:32	6.32	13.51	12.17	10:38	10.58	12.39	12.29	11:44	11.34	10.62	12.13
9:33	6.47	13.38	12.18	10:39	10.58	12.37	12.29	11:45	11.36	10.59	12.13
9:34	6.62	13.26	12.18	10:40	10.59	12.36	12.29	11:46	11.38	10.56	12.12
9:35	6.76	13.15	12.19	10:41	10.59	12.34	12.29	11:47	11.40	10.52	12.12
9:36	6.91	13.06	12.20	10:42	10.59	12.32	12.29	11:48	11.42	10.49	12.11
9:37	7.05	12.97	12.20	10:43	10.59	12.31	12.29	11:49	11.44	10.45	12.11
9:38	7.20	12.88	12.21	10:44	10.60	12.29	12.29	11:50	11.47	10.42	12.10
9:39	7.34	12.81	12.21	10:45	10.60	12.27	12.29	11:51	11.49	10.38	12.09
9:40	7.48	12.75	12.21	10:46	10.60	12.25	12.29	11:52	11.51	10.34	12.09
9:41	7.61	12.69	12.22	10:47	10.61	12.23	12.29	11:53	11.54	10.31	12.08
9:42	7.75	12.64	12.22	10:48	10.61	12.21	12.29	11:54	11.56	10.27	12.08
9:43	7.88	12.60	12.22	10:49	10.61	12.19	12.29	11:55	11.58	10.24	12.07
9:44	8.00	12.57	12.22	10:50	10.62	12.17	12.29	11:56	11.61	10.20	12.06
9:45	8.13	12.54	12.23	10:51	10.62	12.15	12.29	11:57	11.63	10.16	12.06
9:46	8.25	12.52	12.23	10:52	10.63	12.13	12.29	11:58	11.66	10.13	12.05
9:47	8.37	12.50	12.23	10:53	10.64	12.11	12.29	11:59	11.68	10.09	12.04
9:48	8.48	12.49	12.23	10:54	10.64	12.09	12.29	12: 0	11.71	10.05	12.04
9:49	8.59	12.49	12.23	10:55	10.65	12.06	12.29	12: 1	11.73	10.02	12.03
9:50	8.70	12.50	12.23	10:56	10.65	12.04	12.29	12: 2	11.76	9.98	12.02
9:51	8.81	12.50	12.24	10:57	10.66	12.02	12.29	12: 3	11.79	9.94	12.02
9:52	8.91	12.50	12.24	10:58	10.67	11.99	12.29	12: 4	11.82	9.90	12.01
9:53	9.01	12.50	12.24	10:59	10.68	11.97	12.28	12: 5	11.84	9.87	12.00
9:54	9.10	12.51	12.24	11: 0	10.69	11.94	12.28	12: 6	11.87	9.83	12.00
9:55	9.20	12.51	12.24	11: 1	10.69	11.92	12.28	12: 7	11.90	9.79	11.99
9:56	9.30	12.51	12.24	11: 2	10.70	11.90	12.28	12: 8	11.93	9.75	11.98
9:57	9.39	12.51	12.24	11: 3	10.71	11.87	12.28	12: 9	11.96	9.71	11.97
9:58	9.49	12.52	12.25	11: 4	10.72	11.84	12.28	12:10	11.98	9.68	11.97
9:59	9.58	12.52	12.25	11: 5	10.73	11.82	12.27	12:11	12.01	9.64	11.96

12:12	12.04	9.60	11.95	13:18	15.08	6.66	11.30	14:24	4.72	17.85	11.15
12:13	12.07	9.56	11.94	13:19	15.14	6.61	11.28	14:25	4.65	18.00	11.17
12:14	12.11	9.52	11.94	13:20	15.20	6.55	11.27	14:26	4.58	18.14	11.18
12:15	12.14	9.48	11.93	13:21	15.26	6.50	11.26	14:27	4.51	18.28	11.20
12:16	12.17	9.44	11.92	13:22	15.32	6.45	11.25	14:28	4.45	18.41	11.21
12:17	12.20	9.40	11.91	13:23	15.38	6.40	11.23	14:29	4.39	18.54	11.23
12:18	12.23	9.36	11.91	13:24	15.44	6.36	11.22	14:30	4.33	18.66	11.25
12:19	12.26	9.32	11.90	13:25	15.50	6.31	11.21	14:31	4.27	18.77	11.26
12:20	12.30	9.28	11.89	13:26	15.56	6.26	11.20	14:32	4.22	18.88	11.28
12:21	12.33	9.24	11.88	13:27	15.63	6.21	11.18	14:33	4.17	18.97	11.30
12:22	12.37	9.20	11.87	13:28	15.69	6.17	11.17	14:34	4.13	19.07	11.31
12:23	12.40	9.16	11.87	13:29	15.75	6.12	11.16	14:35	4.08	19.15	11.33
12:24	12.44	9.12	11.86	13:30	15.81	6.08	11.15	14:36	4.04	19.23	11.35
12:25	12.47	9.08	11.85	13:31	15.87	6.05	11.13	14:37	4.00	19.30	11.36
12:26	12.51	9.04	11.84	13:32	15.92	6.04	11.12	14:38	3.96	19.36	11.38
12:27	12.54	9.00	11.83	13:33	15.97	6.05	11.11	14:39	3.92	19.42	11.40
12:28	12.58	8.96	11.82	13:34	15.99	6.08	11.09	14:40	3.89	19.48	11.42
12:29	12.62	8.92	11.81	13:35	16.01	6.12	11.08	14:41	3.87	19.52	11.43
12:30	12.66	8.87	11.80	13:36	16.00	6.18	11.07	14:42	3.86	19.57	11.45
12:31	12.69	8.83	11.80	13:37	15.97	6.25	11.06	14:43	3.87	19.61	11.47
12:32	12.73	8.79	11.79	13:38	15.92	6.34	11.04	14:44	3.88	19.64	11.49
12:33	12.77	8.75	11.78	13:39	15.84	6.45	11.03	14:45	3.90	19.67	11.50
12:34	12.81	8.71	11.77	13:40	15.74	6.57	11.02	14:46	3.92	19.69	11.52
12:35	12.85	8.66	11.76	13:41	15.61	6.71	11.01	14:47	3.95	19.72	11.54
12:36	12.89	8.62	11.75	13:42	15.45	6.87	11.00	14:48	3.98	19.73	11.56
12:37	12.94	8.58	11.74	13:43	15.26	7.03	10.99	14:49	4.01	19.75	11.57
12:38	12.98	8.53	11.73	13:44	15.05	7.22	10.98	14:50	4.05	19.76	11.59
12:39	13.02	8.49	11.72	13:45	14.81	7.41	10.97	14:51	4.08	19.76	11.61
12:40	13.06	8.45	11.71	13:46	14.54	7.63	10.96	14:52	4.12	19.77	11.63
12:41	13.11	8.40	11.70	13:47	14.25	7.85	10.96	14:53	4.16	19.77	11.64
12:42	13.15	8.36	11.69	13:48	13.94	8.09	10.95	14:54	4.20	19.76	11.66
12:43	13.20	8.32	11.68	13:49	13.61	8.34	10.94	14:55	4.24	19.76	11.68
12:44	13.25	8.27	11.67	13:50	13.27	8.61	10.94	14:56	4.28	19.75	11.69
12:45	13.29	8.23	11.66	13:51	12.90	8.88	10.93	14:57	4.32	19.74	11.71
12:46	13.34	8.18	11.65	13:52	12.53	9.17	10.93	14:58	4.36	19.73	11.73
12:47	13.39	8.14	11.64	13:53	12.14	9.47	10.92	14:59	4.41	19.71	11.74
12:48	13.44	8.09	11.63	13:54	11.75	9.78	10.92	15: 0	4.45	19.69	11.76
12:49	13.49	8.05	11.62	13:55	11.36	10.10	10.92	15: 1	4.49	19.67	11.78
12:50	13.54	8.00	11.61	13:56	10.96	10.43	10.91	15: 2	4.54	19.65	11.79
12:51	13.59	7.96	11.60	13:57	10.57	10.77	10.91	15: 3	4.59	19.63	11.81
12:52	13.64	7.91	11.59	13:58	10.18	11.12	10.91	15: 4	4.63	19.60	11.83
12:53	13.69	7.87	11.58	13:59	9.79	11.48	10.91	15: 5	4.68	19.58	11.84
12:54	13.75	7.82	11.57	14: 0	9.41	11.84	10.92	15: 6	4.73	19.55	11.86
12:55	13.80	7.78	11.56	14: 1	9.04	12.20	10.92	15: 7	4.78	19.52	11.87
12:56	13.86	7.73	11.55	14: 2	8.69	12.54	10.92	15: 8	4.82	19.48	11.89
12:57	13.91	7.68	11.54	14: 3	8.35	12.88	10.93	15: 9	4.87	19.45	11.90
12:58	13.97	7.64	11.53	14: 4	8.03	13.21	10.93	15:10	4.92	19.42	11.92
12:59	14.03	7.59	11.52	14: 5	7.73	13.52	10.94	15:11	4.97	19.38	11.94
13: 0	14.09	7.54	11.51	14: 6	7.45	13.83	10.94	15:12	5.03	19.34	11.95
13: 1	14.14	7.49	11.50	14: 7	7.18	14.13	10.95	15:13	5.08	19.30	11.97
13: 2	14.20	7.45	11.48	14: 8	6.94	14.42	10.96	15:14	5.13	19.26	11.98
13: 3	14.26	7.40	11.47	14: 9	6.71	14.69	10.97	15:15	5.18	19.22	11.99
13: 4	14.31	7.35	11.46	14:10	6.50	14.96	10.98	15:16	5.24	19.18	12.01
13: 5	14.37	7.30	11.45	14:11	6.30	15.22	10.99	15:17	5.29	19.14	12.02
13: 6	14.42	7.25	11.44	14:12	6.12	15.47	11.00	15:18	5.35	19.09	12.04
13: 7	14.47	7.21	11.43	14:13	5.95	15.72	11.01	15:19	5.40	19.05	12.05
13: 8	14.53	7.16	11.42	14:14	5.80	15.95	11.02	15:20	5.46	19.00	12.07
13: 9	14.58	7.11	11.40	14:15	5.65	16.17	11.03	15:21	5.51	18.95	12.08
13:10	14.63	7.06	11.39	14:16	5.52	16.39	11.04	15:22	5.57	18.91	12.09
13:11	14.69	7.01	11.38	14:17	5.39	16.60	11.05	15:23	5.63	18.86	12.11
13:12	14.74	6.96	11.37	14:18	5.27	16.80	11.07	15:24	5.68	18.81	12.12
13:13	14.80	6.91	11.36	14:19	5.17	17.00	11.08	15:25	5.74	18.76	12.13
13:14	14.85	6.86	11.35	14:20	5.07	17.18	11.09	15:26	5.80	18.71	12.15
13:15	14.91	6.81	11.33	14:21	4.97	17.36	11.11	15:27	5.86	18.66	12.16
13:16	14.96	6.76	11.32	14:22	4.88	17.53	11.12	15:28	5.92	18.60	12.17
13:17	15.02	6.71	11.31	14:23	4.80	17.69	11.14	15:29	5.98	18.55	12.18

15:30	6.04	18.50	12.20	16:36	12.76	14.02	12.68	17:42	21.68	7.99	12.51
15:31	6.11	18.44	12.21	16:37	12.92	13.94	12.68	17:43	21.85	7.91	12.51
15:32	6.17	18.39	12.22	16:38	13.08	13.86	12.68	17:44	22.02	7.83	12.50
15:33	6.23	18.33	12.23	16:39	13.24	13.77	12.68	17:45	22.19	7.75	12.49
15:34	6.30	18.28	12.25	16:40	13.41	13.69	12.69	17:46	22.35	7.67	12.49
15:35	6.36	18.22	12.26	16:41	13.56	13.61	12.69	17:47	22.52	7.60	12.48
15:36	6.43	18.16	12.27	16:42	13.71	13.53	12.69	17:48	22.69	7.52	12.47
15:37	6.49	18.11	12.28	16:43	13.84	13.45	12.69	17:49	22.86	7.45	12.46
15:38	6.56	18.05	12.29	16:44	13.96	13.36	12.69	17:50	23.02	7.38	12.46
15:39	6.62	17.99	12.30	16:45	14.08	13.28	12.69	17:51	23.19	7.31	12.45
15:40	6.69	17.93	12.31	16:46	14.20	13.20	12.69	17:52	23.35	7.24	12.44
15:41	6.76	17.87	12.32	16:47	14.31	13.11	12.69	17:53	23.52	7.17	12.43
15:42	6.83	17.81	12.33	16:48	14.42	13.03	12.69	17:54	23.69	7.10	12.42
15:43	6.90	17.75	12.34	16:49	14.53	12.94	12.70	17:55	23.85	7.04	12.42
15:44	6.97	17.69	12.35	16:50	14.63	12.86	12.70	17:56	24.01	6.97	12.41
15:45	7.04	17.63	12.36	16:51	14.74	12.77	12.70	17:57	24.18	6.91	12.40
15:46	7.11	17.57	12.37	16:52	14.85	12.69	12.70	17:58	24.34	6.84	12.39
15:47	7.18	17.50	12.38	16:53	14.95	12.60	12.70	17:59	24.51	6.78	12.38
15:48	7.26	17.44	12.39	16:54	15.06	12.51	12.70	18: 0	24.67	6.72	12.37
15:49	7.33	17.38	12.40	16:55	15.17	12.43	12.70	18: 1	24.83	6.66	12.36
15:50	7.40	17.32	12.41	16:56	15.28	12.34	12.69	18: 2	24.99	6.60	12.36
15:51	7.48	17.25	12.42	16:57	15.39	12.25	12.69	18: 3	25.15	6.55	12.35
15:52	7.55	17.19	12.43	16:58	15.50	12.16	12.69	18: 4	25.31	6.49	12.34
15:53	7.63	17.12	12.44	16:59	15.61	12.08	12.69	18: 5	25.47	6.43	12.33
15:54	7.71	17.06	12.45	17: 0	15.72	11.99	12.69	18: 6	25.63	6.38	12.32
15:55	7.79	16.99	12.46	17: 1	15.84	11.90	12.69	18: 7	25.78	6.32	12.31
15:56	7.86	16.93	12.47	17: 2	15.96	11.81	12.69	18: 8	25.94	6.27	12.30
15:57	7.94	16.86	12.47	17: 3	16.08	11.72	12.69	18: 9	26.10	6.22	12.29
15:58	8.02	16.80	12.48	17: 4	16.20	11.63	12.69	18:10	26.25	6.16	12.28
15:59	8.10	16.73	12.49	17: 5	16.32	11.54	12.68	18:11	26.41	6.11	12.27
16: 0	8.19	16.66	12.50	17: 6	16.45	11.44	12.68	18:12	26.56	6.06	12.27
16: 1	8.28	16.60	12.51	17: 7	16.58	11.35	12.68	18:13	26.72	6.01	12.26
16: 2	8.37	16.53	12.51	17: 8	16.71	11.26	12.68	18:14	26.87	5.96	12.25
16: 3	8.47	16.46	12.52	17: 9	16.84	11.17	12.67	18:15	27.03	5.91	12.24
16: 4	8.57	16.39	12.53	17:10	16.97	11.07	12.67	18:16	27.18	5.86	12.23
16: 5	8.67	16.32	12.53	17:11	17.11	10.98	12.67	18:17	27.33	5.82	12.22
16: 6	8.78	16.25	12.54	17:12	17.24	10.88	12.67	18:18	27.48	5.77	12.21
16: 7	8.89	16.19	12.55	17:13	17.36	10.79	12.66	18:19	27.63	5.72	12.20
16: 8	9.00	16.12	12.55	17:14	17.49	10.69	12.66	18:20	27.78	5.68	12.19
16: 9	9.11	16.05	12.56	17:15	17.62	10.60	12.66	18:21	27.93	5.63	12.18
16:10	9.23	15.98	12.57	17:16	17.74	10.50	12.65	18:22	28.08	5.59	12.17
16:11	9.34	15.90	12.57	17:17	17.87	10.40	12.65	18:23	28.23	5.55	12.16
16:12	9.46	15.83	12.58	17:18	18.00	10.31	12.65	18:24	28.38	5.50	12.15
16:13	9.58	15.76	12.59	17:19	18.12	10.21	12.64	18:25	28.52	5.46	12.14
16:14	9.70	15.69	12.59	17:20	18.25	10.11	12.64	18:26	28.67	5.42	12.13
16:15	9.83	15.62	12.60	17:21	18.38	10.01	12.63	18:27	28.82	5.38	12.12
16:16	9.95	15.55	12.60	17:22	18.52	9.91	12.63	18:28	28.96	5.33	12.11
16:17	10.07	15.47	12.61	17:23	18.65	9.81	12.63	18:29	29.11	5.29	12.10
16:18	10.20	15.40	12.61	17:24	18.79	9.71	12.62	18:30	29.25	5.25	12.09
16:19	10.33	15.33	12.62	17:25	18.93	9.61	12.62	18:31	29.39	5.21	12.08
16:20	10.46	15.25	12.62	17:26	19.08	9.51	12.61	18:32	29.54	5.18	12.07
16:21	10.59	15.18	12.63	17:27	19.22	9.40	12.61	18:33	29.68	5.14	12.06
16:22	10.72	15.10	12.63	17:28	19.37	9.30	12.60	18:34	29.82	5.10	12.05
16:23	10.86	15.03	12.63	17:29	19.53	9.20	12.60	18:35	29.96	5.06	12.04
16:24	10.99	14.95	12.64	17:30	19.68	9.09	12.59	18:36	30.10	5.02	12.03
16:25	11.13	14.88	12.64	17:31	19.84	8.99	12.59	18:37	30.24	4.99	12.02
16:26	11.27	14.80	12.65	17:32	20.01	8.89	12.58	18:38	30.38	4.95	12.01
16:27	11.41	14.72	12.65	17:33	20.17	8.79	12.57	18:39	30.52	4.91	12.00
16:28	11.55	14.65	12.65	17:34	20.33	8.69	12.57	18:40	30.66	4.88	11.99
16:29	11.70	14.57	12.66	17:35	20.50	8.60	12.56	18:41	30.80	4.84	11.98
16:30	11.84	14.49	12.66	17:36	20.67	8.51	12.55	18:42	30.93	4.81	11.97
16:31	11.99	14.41	12.66	17:37	20.84	8.41	12.55	18:43	31.07	4.77	11.96
16:32	12.14	14.33	12.67	17:38	21.00	8.33	12.54	18:44	31.20	4.74	11.95
16:33	12.29	14.26	12.67	17:39	21.17	8.24	12.54	18:45	31.34	4.71	11.94
16:34	12.45	14.18	12.67	17:40	21.34	8.15	12.53	18:46	31.47	4.67	11.93
16:35	12.60	14.10	12.68	17:41	21.51	8.07	12.52	18:47	31.61	4.64	11.92

18:48	31.74	4.61	11.91	19:54	24.89	8.07	11.27	21: 0	4.39	20.11	11.70
18:49	31.87	4.58	11.90	19:55	23.77	8.45	11.27	21: 1	4.37	20.10	11.71
18:50	32.00	4.54	11.89	19:56	22.65	8.83	11.26	21: 2	4.35	20.08	11.72
18:51	32.14	4.51	11.88	19:57	21.54	9.23	11.26	21: 3	4.34	20.06	11.73
18:52	32.27	4.48	11.87	19:58	20.44	9.63	11.26	21: 4	4.35	20.04	11.74
18:53	32.40	4.45	11.86	19:59	19.36	10.05	11.25	21: 5	4.37	20.02	11.75
18:54	32.52	4.42	11.85	20: 0	18.31	10.47	11.25	21: 6	4.39	19.99	11.76
18:55	32.65	4.39	11.84	20: 1	17.30	10.88	11.25	21: 7	4.42	19.97	11.77
18:56	32.78	4.36	11.83	20: 2	16.33	11.29	11.25	21: 8	4.46	19.94	11.78
18:57	32.91	4.33	11.82	20: 3	15.41	11.68	11.25	21: 9	4.50	19.91	11.79
18:58	33.03	4.30	11.81	20: 4	14.54	12.07	11.25	21:10	4.54	19.87	11.80
18:59	33.16	4.27	11.80	20: 5	13.74	12.44	11.26	21:11	4.58	19.84	11.81
19: 0	33.29	4.24	11.79	20: 6	12.99	12.81	11.26	21:12	4.63	19.81	11.82
19: 1	33.41	4.21	11.78	20: 7	12.29	13.16	11.26	21:13	4.67	19.77	11.83
19: 2	33.53	4.19	11.77	20: 8	11.65	13.50	11.26	21:14	4.72	19.73	11.84
19: 3	33.66	4.16	11.75	20: 9	11.07	13.84	11.26	21:15	4.77	19.69	11.85
19: 4	33.78	4.13	11.74	20:10	10.53	14.16	11.27	21:16	4.82	19.65	11.85
19: 5	33.90	4.10	11.73	20:11	10.05	14.47	11.27	21:17	4.87	19.61	11.86
19: 6	34.02	4.08	11.72	20:12	9.60	14.77	11.28	21:18	4.92	19.57	11.87
19: 7	34.14	4.05	11.71	20:13	9.20	15.07	11.28	21:19	4.98	19.52	11.88
19: 8	34.26	4.02	11.70	20:14	8.83	15.35	11.29	21:20	5.03	19.48	11.89
19: 9	34.38	4.00	11.69	20:15	8.50	15.62	11.29	21:21	5.08	19.43	11.90
19:10	34.50	3.97	11.68	20:16	8.19	15.88	11.30	21:22	5.14	19.38	11.91
19:11	34.62	3.95	11.67	20:17	7.92	16.14	11.30	21:23	5.19	19.34	11.92
19:12	34.74	3.92	11.66	20:18	7.67	16.38	11.31	21:24	5.25	19.29	11.92
19:13	34.85	3.89	11.65	20:19	7.44	16.62	11.32	21:25	5.31	19.24	11.93
19:14	34.97	3.87	11.64	20:20	7.23	16.84	11.32	21:26	5.36	19.19	11.94
19:15	35.08	3.85	11.63	20:21	7.04	17.06	11.33	21:27	5.42	19.13	11.95
19:16	35.20	3.82	11.62	20:22	6.86	17.27	11.34	21:28	5.48	19.08	11.96
19:17	35.31	3.80	11.61	20:23	6.70	17.47	11.34	21:29	5.54	19.03	11.97
19:18	35.42	3.77	11.60	20:24	6.55	17.66	11.35	21:30	5.60	18.97	11.97
19:19	35.54	3.75	11.59	20:25	6.41	17.85	11.36	21:31	5.66	18.92	11.98
19:20	35.65	3.72	11.58	20:26	6.28	18.03	11.37	21:32	5.72	18.86	11.99
19:21	35.76	3.70	11.56	20:27	6.16	18.20	11.38	21:33	5.78	18.81	12.00
19:22	35.87	3.68	11.55	20:28	6.05	18.36	11.38	21:34	5.84	18.75	12.01
19:23	35.98	3.66	11.54	20:29	5.94	18.51	11.39	21:35	5.90	18.69	12.01
19:24	36.09	3.63	11.53	20:30	5.85	18.66	11.40	21:36	5.97	18.64	12.02
19:25	36.19	3.61	11.52	20:31	5.75	18.80	11.41	21:37	6.03	18.58	12.03
19:26	36.30	3.59	11.51	20:32	5.66	18.93	11.42	21:38	6.10	18.52	12.04
19:27	36.41	3.57	11.50	20:33	5.58	19.06	11.43	21:39	6.16	18.46	12.04
19:28	36.51	3.54	11.49	20:34	5.51	19.17	11.44	21:40	6.23	18.40	12.05
19:29	36.62	3.52	11.48	20:35	5.43	19.28	11.45	21:41	6.29	18.34	12.06
19:30	36.72	3.50	11.47	20:36	5.36	19.37	11.46	21:42	6.36	18.28	12.07
19:31	36.82	3.50	11.46	20:37	5.30	19.46	11.47	21:43	6.43	18.22	12.07
19:32	36.90	3.51	11.45	20:38	5.24	19.55	11.48	21:44	6.49	18.15	12.08
19:33	36.96	3.55	11.44	20:39	5.18	19.63	11.49	21:45	6.56	18.09	12.09
19:34	36.99	3.60	11.43	20:40	5.12	19.70	11.50	21:46	6.63	18.03	12.09
19:35	36.98	3.67	11.42	20:41	5.07	19.76	11.51	21:47	6.70	17.97	12.10
19:36	36.92	3.76	11.41	20:42	5.02	19.82	11.52	21:48	6.77	17.90	12.11
19:37	36.81	3.86	11.40	20:43	4.97	19.87	11.53	21:49	6.84	17.84	12.11
19:38	36.64	3.98	11.39	20:44	4.93	19.92	11.54	21:50	6.91	17.77	12.12
19:39	36.40	4.12	11.38	20:45	4.88	19.96	11.55	21:51	6.99	17.71	12.13
19:40	36.10	4.28	11.37	20:46	4.84	20.00	11.56	21:52	7.06	17.64	12.13
19:41	35.73	4.45	11.36	20:47	4.80	20.03	11.57	21:53	7.13	17.58	12.14
19:42	35.28	4.64	11.35	20:48	4.76	20.06	11.58	21:54	7.21	17.51	12.14
19:43	34.76	4.84	11.34	20:49	4.73	20.08	11.59	21:55	7.28	17.44	12.15
19:44	34.16	5.06	11.33	20:50	4.69	20.10	11.60	21:56	7.36	17.38	12.16
19:45	33.49	5.30	11.32	20:51	4.66	20.12	11.61	21:57	7.44	17.31	12.16
19:46	32.75	5.55	11.32	20:52	4.62	20.13	11.62	21:58	7.52	17.24	12.17
19:47	31.94	5.82	11.31	20:53	4.59	20.14	11.63	21:59	7.59	17.17	12.17
19:48	31.07	6.10	11.30	20:54	4.56	20.14	11.64				
19:49	30.14	6.39	11.30	20:55	4.53	20.14	11.65				
19:50	29.16	6.70	11.29	20:56	4.50	20.14	11.66				
19:51	28.14	7.03	11.28	20:57	4.47	20.14	11.67				
19:52	27.08	7.36	11.28	20:58	4.45	20.13	11.68				
19:53	25.99	7.71	11.27	20:59	4.42	20.12	11.69				