This program was also incorporated into the BIOESTAT application, developed by the author, which includes 16 other statistical tests of current use in biological research. BIOESTAT can be obtained from the website of the Department of Statistics of UFPR, by downloading it at the address <u>http://est.ufpr.br</u> /'Recursos, Software' / 'Projetos Ativos, Bioestat').

It is also important to download a tutorial extensively illustrated with the prints of the screens, exemplifying in a very didactic way the routines of the calculations through examples developed for each test.

### USING THE APPLICATION

The GADVDVC.F application was developed to calculate the degree of aggregation/discrimination (D) of a taxonomic character and also to calculate the weights of a weighting system (on a scale of 1 to 6) that informs the contribution of the character to the formation of subgroups in a group (that brings together 3 or more species) (WA) or for individualization of these same species (WD).

The term 'group' is being used in cases where the studied species do not represent the whole of a genus, but only part of it.

Thus, the conclusions will be valid only for the group studied and should not be extended to the corresponding gender. The methodological foundation for these calculations can be found int he bibliography cited at the end of this chapter.

These are two works that deal with the theme. Maia (2021) presents the methodology for discrete variables (counts and codifications), based on the calculation of the geometric average. Maia (2022) deals with the continuous variables formed by measurements using Analysis of Variance, F Test (one classification criterion), complemented by the Tukey test.

In the yellow boxes, we will reproduce the application's screens numbered in the sequence in which they appear during execution.

The green boxes will show explanatory comments about the screens reproduced.

If the analyzed variable is the result of counts or encodings, the application must be used as follows:





Screen 06

In this step, inform the name of each status that will be identified by a sequential number (code) (1,2,3...k). Example: yellow color = code 1 / white color = code 2 / black color = code 3...



The application will ask you to enter the code referring to the status of the analyzed character for each species.

Screen 08

*****	*****	*****	**
*	You informed	yellow	*
*	Is correct? 0=No	- 1=Yes	*
*****	*****	*****	**

If the information is correct, type 1 and the analysis continues. If not, enter 0 and the entry will be requested again.

Screen 09

******	******	*****
*****	Degree of Discrimination / Aggregation	*****
******	**************************************	******
******	*******	*****
******	******	******
*	Moderate character	*
******	******	******
*	Weight of Discriminative Potential: $WD = 3.5$	*
*	Weight of Aggregate Potential: $WA = 3.5$	*
******	*****	*****

- After informing the code referring to the status of the last species, the application calculates the value of the degree of discrimination / aggregation 'D', on a scale from zero to 5.

- It also informs the interpretation of 'D' (e.g. Moderate character).

- The discrimination (WD) and aggregation (WA) potential are calculated on a scale from 1 to 6. In this example (WD = 3.5 and WA = 3.5). The taxonomic character discriminates and aggregates with the same intensity.

Screen 10

If the analysis involves several taxonomic characters, this routine must be repeated (from screen 04 onwards) as many times as there are characters.

Screen 01a

******	***
* INFORM THE TYPE OF VARIABLES THAT WILL BE ANALYZED	*
* (1 = Discrete Variables - Counting and Encoding)	*
* (2 = Continuous variables - Measurement (weights, measures)	*
***************************************	***
Type '2' for continuous variables	

Screen 02a

# Enter the number 'n' of species that are part of the group.

We will exemplify with the data of 6 species (n = 6) of the genus *Plebeia* (*P.juliani, P.meridionalis, P.droryana, P.emerina, P.remota and P.saiqui* represented by the letters J,M,D,E, R and S, respectively).

The analyzed variable is the measurement of the 'Jaw width' of 5 specimens (m = 5) of each species. See Maia (2022).

	wiathorti		<u>x species c</u>	in the gene	STICDCIU
J	R	S	D	E	Μ
0.90	1.40	1.20	1.15	1.50	1.00
1.00	1.80	1.30	1.20	1.30	0.90
1.00	1.40	1.50	1.15	1.20	0.90
0.90	1.45	1.30	1.20	1.20	0.70
0.90	1.40	1.30	1.00	1.20	0.80

Table 1 - Width of the jaw of six species of the genus Plebeia

The application will then ask you to enter the name (or a numerical code, or alphabetic code, etc.) to identify each of the 'n' species. Remember that compound names (eg *Plebeia-juliani*) must be written with a hyphen.

*******	***************************************	*****
*	Enter species name 1	*
*******	**************	*****

The application will ask you to enter the names of the 6 species (*Plebeia-juliani*, *Plebeia-meridionalis*, etc.)

Screen 04a



Type the character name. In this example 'jaw-width'. Compound names must be spelled with a hyphen.

# Screen 05a

\*\*\*\*\*\*\*

\*

How many specimens of each species analyzed? 

Each species will be represented by measurements originating from samples, all of the same size, with 'm' elements. In this example there will be 6 samples (n = 6), with 5 specimens each: (m = 5).

Screen 06a

******	*****	****	****	****
*	Inform the table	value o	of 'q' of the Tukey Test	*
*	Treatments =	-	Residual df =	*
******	*****	****	*****	****

We need to inform the value of 'q' for the application of the Tukey Test to evaluate the differences between the means of the 6 samples. The value of 'q' can be obtained from the tables attached at the end of this tutorial.

In the horizontal header of the table we will inform the number of treatments. In this example each species is considered as a treatment in the Analysis of Variance. The app will tell us that n = 6.

The application also calculates the degrees of freedom of the residual variance: Residual df = n(m-1) where m is equal to the number of units of each sample (m = 5).

Therefore, Residual df = 6(5-1) or 6x4 = 24

We will use the two values provided by the application (horizontal header = 6 and vertical header = 24). Where the line meets the column is the number q = 4,373, which will be entered on screen 06a.

Screen 08a

\* Enter specimen data 2 of species P.juliani \*

SCREEN 07a and SCREEN 08a show how the data will be requested by the application. After entering the last information of the first species, we will enter the information of the second species, and so on until the last species.

Screen	09a
Dereen	074

*****	
* Analyzed character: Width-of-the-jaw *	
*****	
***************************************	
****** Degree of Discrimination / Aggregation ******	
**************************************	
***************************************	
***************************************	
* Moderate character *	
***************************************	
* Weight of Discriminative Potential: WD = 3.67 *	
* Weight of Aggregate Potential: WA = 3.33 *	
***************************************	

- This screen shows the results of the evaluation of the aggregative potential/discriminative of the taxonomic character 'Width-of-the-jaw'.

- The numerical value (on a scale from 0 to 5) equals 2.67.
- This value classifies the character as 'intermediate', that is, it aggregates and discriminates in approximately equal proportions.
- WD and WA values (on a scale between 1 and 6) express
  - numerically the two similar potentials.

Screen 10a

\*\*\*\*\*

\* Do you want to analyze another character? 0=Nao - 1=Sim \*

If you want to analyze another character, type '1' and the application will restart from SCREEN 04a.

## TABLE VALUES FOR TUKEY'S TEST

On the following pages we transcribe two tables with the values of q'' for the application of the Tukey Test. We chose the 95% level because it is the most used in biological research.

These tables were originally published by H. Leon Harter, as indicated in the bibliography:

#### H. LEON HARTER

## TABLE 3 (Continued)

P = .95

V n	2	3	4	5	6	7	8	9	10
	17.07	24 00	20.00	07.00	1	1.0.00	1	1	1
2	6.085	8.331	9.798	10.88	40.41	12.44	13.03	4/.36	49.07
3	4.501	5.910	6.825	7.502	8.037	8.478	8.853	9.177	9.462
4	3.927	5.040	5.757	6.287	6.707	7.053	7.347	7.602	7.826
5	3.635	4.602	5.218	5.673	6.033	6.330	6.582	6.802	6.995
6	3.461	4.339	4.896	5.305	5.628	5.895	6.122	6.319	6.493
7	3.344	4.165	4.681	5.060	5.359	5.606	5.815	5.998	6.158
8	3.100	4.041	4.529	4.886	5.024	5.399	5.597	5.505	5.918
10	3.151	3.877	4.327	4.654	4.912	5.124	5.305	5.461	5.599
10		1 30011	10521	40021		20124	1.100	2.401	
11	3.113	3.820	4.256	4.574	4.823	5.028	5.202	5.353	5.487
12	3.082	3.7/3	4.199	4.508	4.751	4.950	5.119	5.265	5.395
14	3.033	3.702	4.111	4.407	4.630	4.820	5.049	5-131	5.318
15	3.014	3.674	4.076	4.367	4.595	4.782	4.940	5.077	5.198
16	2.998	3.649	4.046	4.333	4.557	4.741	4.897	5.031	5+150
17	2.984	3.628	4.020	4.303	4.524	4.705	4.858	4.991	5.108
18	2.971	3.609	3.997	4.277	4.495	4.673	4.824	4.956	5.071
19	2.960	3.593	3.977	4.253	4.469	4.645	4.794	4.924	5.038
20	2.950	3.578	3.958	4.232	4.445	4.620	4.768	4.896	5.008
74	2.919	3.532	3.901	4.166	4.373	4.541	4.684	4.807	4.915
30	2.888	3.486	3.845	4.102	4.302	4.464	4.602	4.720	4.824
40	2.858	3.442	3.791	4.039	4.232	4.389	4.521	4.635	4.735
60	-2.829	3.399	.3.737	3.977	4.163	4.314	4.441	4.550	4.646
120	2.800	3.356	3.685	3.917	4.096	4.241	4.363	4.468	4.560
		3434	34033	34838	4 . 0 30	4.1/0	44286	4438/	444/4
	20112	3.314	20033	3.858	4.030	4.170	4.286	4.387	4 • 4 / 4
V n	11	12	13	14	15	4.170	17	4•387 18	19
ν n 1	11 50•59	12 51.96	13 53.20	14 54.33	15 55.36	16 16 56.32	17 57.22	18 58.04	<u>19</u> 58.83
ν n 1 2	11 50.59 14.39	12 51.96 14.75	13 53.20 15.08	14 54.33 15.38	15 55.36 15.65	16 56.32 15.91	17 57.22 16.14	18 58.04 16.37	19 58.83 16.57
ν n 1 2 3	11 50.59 14.39 9.717	12 51.96 14.75 9.946	13 53.20 15.08 10.15	14 54.33 15.38 10.35	15 55.36. 15.65 10.53	16 56.32 15.91 10.69	17 57.22 16.14 10.84	18 58.04 16.37 10.98	19 58.83 16.57 11.11
ν n 1 2 3 4 5	11 50.59 14.39 9.717 8.027 7.168	12 51.96 14.75 9.946 8.208 7.324	13 53.20 15.08 10.15 8.373 7.466	14 54.33 15.38 10.35 8.525 7.596	15 55.36. 15.65 10.53 8.664 7.717	4.170 16 56.32 15.91 10.69 8.794 7.828	17 57.22 16.14 10.84 8.914 7.932	18 58.04 16.37 10.98 9.028 8.030	19 58.83 16.57 11.11 9.134 8.122
ν n 1 2 3 4 5 6	11 50.59 14.39 9.717 8.027 7.168 6.6649	12 51.96 14.75 9.946 8.208 7.324 6.789	13 53.20 15.08 10.15 8.373 7.466 6.917	14 54.33 15.38 10.35 8.525 7.596 7.034	15 55.36. 15.65 10.53 8.664 7.717 7.143	16 56.32 15.91 10.69 8.794 7.828 7.244	17 57.22 16.14 10.84 8.914 7.932 7.338	18 58.04 16.37 10.98 9.028 8.030 7.426	19 58.83 16.57 11.11 9.134 8.122 7.508
ν n 1 2 3 4 5 6 7	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431	13 53.20 15.08 10.15 8.373 7.466 6.917 6.550	14 54.33 15.38 10.35 8.525 7.596 7.034 6.658	15 55.36 15.65 10.53 8.664 7.717 7.143 6.759	16 56.32 15.91 10.69 8.794 7.828 7.244 6.852	17 57.22 16.14 10.84 8.914 7.932 7.338 6.939	18 58.04 16.37 10.98 9.028 8.030 7.426 7.020	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097
ν n 1 2 3 4 5 6 7 8	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175	13 53.20 15.08 10.15 8.373 7.466 6.917 6.550 6.287	14 54.33 15.38 10.35 8.525 7.596 7.596 7.034 6.658 6.389	15 55.36 15.65 10.53 8.664 7.717 7.143 6.759 6.483	16 56.32 15.91 10.69 8.794 7.828 7.244 6.852 6.571	17 57.22 16.14 10.84 8.914 7.338 6.939 6.653	18 58.04 16.37 10.98 9.028 8.030 7.426 7.620 6.729	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097 6.802
ν n 1 2 3 4 5 6 7 8 9	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054 5.867	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175 5.983	13 53.20 15.08 10.15 8.373 7.466 6.917 6.550 6.287 6.089	14 54.33 15.38 10.35 8.525 7.596 7.596 7.034 6.658 6.389 6.186	15 55.36 15.65 10.53 8.664 7.717 7.143 6.759 6.483 6.276	16 56.32 15.91 10.69 8.794 7.828 7.244 6.852 6.571 6.359	17 57.22 16.14 10.84 8.914 7.338 6.939 6.653 6.437	18 58.04 16.37 10.98 9.028 8.030 7.426 7.020 6.729 6.510	19 58.83 16.57 11.11 9.134 8.122 7.508 7.509 7.6.802 6.579
ν n 1 2 3 4 5 6 7 8 9 10	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054 5.867 5.722	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175 5.988 5.833	13 53.20 15.08 10.15 8.37.3 7.466 6.917 6.550 6.287 6.089 5.935	14 54.33 15.38 10.35 8.525 7.596 7.034 6.658 6.389 6.186 6.028	15 55.36 15.65 10.53 8.664 7.717 7.143 6.759 6.483 6.276 6.114	4.170 16 56.32 15.91 10.69 8.794 7.828 7.244 6.852 6.571 6.359 6.194	17 57.22 16.14 10.84 8.914 7.932 7.338 6.939 6.653 6.437 6.269	18 58.04 16.37 10.98 9.028 8.030 7.426 7.020 6.729 6.510 6.339	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097 6.802 6.579 6.405
ν n 1 2 3 4 5 6 7 8 9 10	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054 5.867 5.722	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175 5.988 5.833	13 53.20 15.08 10.15 8.37.3 7.466 6.917 6.550 6.287 6.089 5.935	14 54.33 15.38 10.35 8.525 7.596 7.034 6.658 6.389 6.186 6.028	4.030 15 55.36 15.65 10.53 8.664 7.717 7.143 6.759 6.483 6.276 6.114 5.884	4.170 16 56.32 15.91 10.69 8.794 7.828 7.828 7.244 6.852 6.571 6.359 6.194 6.062	17 57.22 16.14 10.84 8.914 7.932 7.338 6.939 6.653 6.437 6.269	18 58.04 16.37 10.98 9.028 8.030 7.426 7.020 6.729 6.510 6.339	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097 6.802 6.579 6.405
ν n 1 2 3 4 5 6 7 8 9 10 11 12	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054 5.867 5.722 5.605 5.511	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175 5.983 5.833 5.713 5.615	13 53.20 15.08 10.15 8.373 7.466 6.917 6.550 6.287 6.089 5.935 5.811 5.710	14 54.33 15.38 10.35 8.525 7.596 7.034 6.658 6.389 6.186 6.028 5.901 5.793	15 55.36 15.65 10.53 8.664 7.717 7.143 6.759 6.483 6.276 6.114 5.984 5.878	4.170 16 56.32 15.91 10.69 8.794 7.828 7.2244 6.852 6.571 6.359 6.194 6.062 5.953	17 57.22 16.14 10.84 8.914 7.338 6.939 6.653 6.437 6.269 6.134 6.023	18 58.04 16.37 10.98 9.028 8.030 7.426 7.020 6.729 6.510 6.339 6.202 6.089	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097 6.802 6.579 6.405 6.265 6.151
n           1           2           3           4           5           6           7           8           9           10           11           12           13	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054 5.867 5.722 5.605 5.511 5.511	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175 5.983 5.833 5.713 5.615 5.533	13 53.20 15.08 10.15 8.373 7.466 6.917 6.550 6.287 6.089 5.935 5.935 5.811 5.710 5.625	14 54.33 15.38 10.35 8.525 7.596 7.034 6.658 6.389 6.186 6.028 5.901 5.798 5.711	4.030 15 55.36 10.53 8.664 7.717 7.143 6.759 6.483 6.276 6.114 5.984 5.878 5.789	16 56.32 15.91 10.69 8.794 7.8248 7.8248 7.8248 6.852 6.571 6.359 6.194 6.062 5.953 5.862	17 57.22 16.14 10.84 8.914 7.338 6.939 6.653 6.437 6.269 6.134 6.023 5.931	4.387 18 58.04 16.37 10.98 9.028 8.030 7.426 7.426 7.426 6.339 6.202 6.339 6.202 6.089 5.995	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097 6.802 6.579 6.405 6.265 6.151 6.055
n           1           2           3           4           5           6           7           8           9           10           11           12           13           14	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054 5.722 5.605 5.511 5.431 5.364	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175 5.983 5.833 5.615 5.533 5.463	13 53.20 15.08 10.15 8.97.3 7.466 6.917 6.550 6.287 6.089 5.935 5.935 5.935 5.625 5.625 5.554	14 54.33 15.38 10.35 8.525 7.596 7.034 6.658 6.389 6.186 6.028 5.901 5.793 5.711 5.637	4.030 15 55.36 15.65 10.53 8.664 7.717 7.143 6.759 6.483 6.276 6.114 5.984 5.789 5.714	16 56.32 15.91 10.69 8.794 7.8248 6.852 6.571 6.359 6.194 6.052 5.862 5.786	17 57.22 16.14 10.84 8.914 7.338 6.939 6.653 6.437 6.269 6.134 6.023 5.931 5.852	4.387 18 58.04 16.37 10.98 9.028 8.030 7.426 7.426 7.420 6.339 6.202 6.029 5.995 5.915	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097 6.802 6.579 6.405 6.265 6.151 6.055 5.974
n           1           2           3           4           5           6           7           8           9           10           11           12           13           14           15	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054 5.867 5.722 5.605 5.511 5.364 5.364 5.306	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175 5.983 5.833 5.615 5.533 5.463 5.404	13 53.20 15.08 10.15 8.97.3 7.446 6.917 6.089 5.935 5.811 5.625 5.554 5.554 5.554 5.493	14 54.33 15.38 10.35 8.525 7.596 7.034 6.658 6.389 6.186 6.028 5.901 5.798 5.711 5.637 5.574 5.574	4.030 15 55.36 15.65 10.53 8.664 7.717 7.143 6.759 6.483 6.276 6.114 5.984 5.984 5.789 5.714 5.649 5.649	16 56.32 15.91 10.69 8.794 7.828 7.244 6.852 6.571 6.359 6.194 6.062 5.953 5.862 5.786 5.786	17 57.22 16.14 10.84 8.914 7.932 7.338 6.939 6.653 6.437 6.269 6.134 6.023 5.931 5.852 5.785 5.785	4.387 18 58.04 16.37 10.98 9.028 8.030 7.426 6.729 6.510 6.339 6.202 6.089 5.915 5.846	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097 6.802 6.579 6.405 6.265 6.151 6.055 5.974 5.904
v         n           1         2           3         4           5         6           7         8           9         10           11         12           13         14           15         16           17         17	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054 5.867 5.722 5.605 5.511 5.364 5.306 5.213	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175 5.988 5.833 5.713 5.615 5.533 5.463 5.404 5.352 5.207	13 53.20 15.08 10.15 8.373 7.466 6.917 6.550 6.287 5.935 5.8511 5.555 5.555 5.493 5.493 5.392	14 54.33 15.38 10.35 8.525 7.596 7.034 6.658 6.389 6.186 6.028 5.901 5.793 5.771 5.574 5.520 5.471	4.030 15 55.36 15.65 10.53 8.664 7.717 7.143 6.759 6.483 6.276 6.114 5.984 5.789 5.714 5.649 5.593	16 56.32 15.91 10.69 8.794 7.828 7.244 6.852 6.359 6.194 6.062 5.953 5.862 5.720 5.662	17 57.22 16.14 10.84 8.914 7.932 7.338 6.939 6.653 6.437 6.269 6.134 6.023 5.931 5.852 5.785 5.727 5.675	4.387 18 58.04 16.37 10.98 9.028 8.030 7.426 7.426 7.420 6.510 6.339 6.202 6.089 5.995 5.915 5.846 5.736	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097 6.802 6.579 6.405 6.265 6.151 6.055 5.974 5.904 5.843 5.700
n           1           2           3           4           5           6           7           8           9           10           11           12           13           14           15           16           17           18	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054 5.867 5.722 5.605 5.511 5.431 5.431 5.364 5.306 5.256 5.212 5.174	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175 5.982 5.833 5.615 5.533 5.463 5.463 5.463 5.404 5.352 5.307 5.267	13 53.20 15.08 10.15 8.373 7.466 6.917 6.550 6.287 6.287 5.935 5.811 5.625 5.555 5.493 5.493 5.493 5.439 5.392	14 54.33 15.38 10.35 8.525 7.596 7.034 6.658 6.389 6.186 6.028 5.703 5.771 5.574 5.574 5.520 5.471 5.429	$4 \cdot 030$ 15 $55 \cdot 36$ $15 \cdot 65$ $10 \cdot 53$ $8 \cdot 664$ $7 \cdot 717$ $7 \cdot 143$ $6 \cdot 759$ $6 \cdot 483$ $6 \cdot 276$ $6 \cdot 114$ $5 \cdot 984$ $5 \cdot 789$ $5 \cdot 789$ $5 \cdot 714$ $5 \cdot 649$ $5 \cdot 593$ $5 \cdot 544$ $5 \cdot 501$	4.170 16 56.32 15.91 10.69 8.794 7.828 6.852 6.359 6.194 6.062 5.953 5.862 5.720 5.662 5.662 5.568	17 57.22 16.14 10.84 8.914 7.932 7.338 6.939 6.653 6.437 6.269 6.134 6.023 5.931 5.852 5.785 5.727 5.675 5.630	4.387 18 58.04 16.37 10.98 9.028 8.030 7.426 7.426 7.426 7.426 6.510 6.339 6.202 6.089 5.995 5.915 5.846 5.786 5.786 5.784	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097 6.802 6.265 6.151 6.055 5.974 5.904 5.943 5.790
n           1           2           3           4           5           6           7           8           9           10           11           12           13           14           15           16           17           18           19	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054 5.867 5.722 5.605 5.511 5.431 5.364 5.364 5.256 5.212 5.174 5.140	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175 5.983 5.615 5.983 5.615 5.533 5.463 5.463 5.464 5.307 5.267 5.231	13 53.20 15.08 10.15 8.373 7.466 6.917 6.550 6.287 6.089 5.935 5.554 5.554 5.493 5.493 5.4392 5.355	14 54.33 15.38 10.35 8.525 7.596 7.034 6.658 6.389 6.186 6.028 5.901 5.798 5.711 5.637 5.574 5.520 5.471 5.520 5.471 5.391	$4 \cdot 030$ 15 $55 \cdot 36$ $15 \cdot 65$ $10 \cdot 53$ $8 \cdot 664$ $7 \cdot 717$ $7 \cdot 143$ $6 \cdot 759$ $6 \cdot 483$ $6 \cdot 276$ $6 \cdot 114$ $5 \cdot 984$ $5 \cdot 878$ $5 \cdot 789$ $5 \cdot 714$ $5 \cdot 593$ $5 \cdot 544$ $5 \cdot 501$ $5 \cdot 501$ $5 \cdot 501$	4.170 16 56.32 15.91 10.69 8.794 7.828 7.828 6.852 6.571 6.359 6.194 6.062 5.953 5.862 5.726 5.726 5.726 5.726 5.62 5.528	17 57.22 16.14 10.84 8.914 7.338 6.939 6.653 6.437 6.269 6.134 6.023 5.931 5.852 5.727 5.675 5.675 5.589	4.387 18 58.04 16.37 10.98 9.028 8.030 7.426 6.510 6.339 6.202 6.089 5.915 5.846 5.786 5.734 5.647	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097 6.802 6.579 6.405 6.265 6.151 6.055 5.974 5.843 5.790 5.743 5.701
n           1           2           3           4           5           6           7           8           9           10           11           12           13           14           15           16           17           18           19           20	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054 5.867 5.722 5.605 5.511 5.431 5.364 5.364 5.256 5.212 5.174 5.140 5.108	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175 5.983 5.833 5.615 5.533 5.463 5.463 5.463 5.463 5.463 5.352 5.307 5.267 5.231 5.199	13 53.20 15.08 10.15 8.373 7.466 6.917 6.550 6.287 6.089 5.935 5.554 5.439 5.439 5.439 5.352 5.315 5.282	$\begin{array}{c} 3 \cdot 8 28 \\ \hline 14 \\ 54 \cdot 33 \\ 15 \cdot 38 \\ 10 \cdot 35 \\ 8 \cdot 525 \\ 7 \cdot 596 \\ 7 \cdot 034 \\ 6 \cdot 658 \\ 6 \cdot 389 \\ 6 \cdot 186 \\ 6 \cdot 028 \\ \hline 5 \cdot 701 \\ 5 \cdot 793 \\ 5 \cdot 711 \\ 5 \cdot 637 \\ 5 \cdot 520 \\ 5 \cdot 471 \\ 5 \cdot 520 \\ 5 \cdot 471 \\ 5 \cdot 520 \\ 5 \cdot 391 \\ 5 \cdot 357 \\ \hline \end{array}$	$4 \cdot 030$ 15 $55 \cdot 36$ $15 \cdot 65$ $10 \cdot 53$ $8 \cdot 664$ $7 \cdot 717$ $7 \cdot 143$ $6 \cdot 759$ $6 \cdot 483$ $6 \cdot 276$ $6 \cdot 114$ $5 \cdot 984$ $5 \cdot 878$ $5 \cdot 789$ $5 \cdot 714$ $5 \cdot 593$ $5 \cdot 544$ $5 \cdot 501$ $5 \cdot 501$ $5 \cdot 427$	16 56.32 15.91 10.69 8.794 7.828 7.828 7.828 6.852 6.571 6.359 5.953 5.862 5.786 5.786 5.786 5.786 5.612 5.662 5.528 5.528 5.528	$\begin{array}{r} 4 \bullet 286 \\ \hline 17 \\ 57 \bullet 22 \\ 16 \bullet 14 \\ 10 \bullet 84 \\ 8 \bullet 914 \\ 7 \bullet 932 \\ 7 \bullet 338 \\ 6 \bullet 939 \\ 6 \bullet 653 \\ 6 \bullet 437 \\ 6 \bullet 269 \\ \hline 6 \bullet 134 \\ 6 \bullet 023 \\ 5 \bullet 931 \\ 5 \bullet 852 \\ 5 \bullet 785 \\ 5 \bullet 727 \\ 5 \bullet 675 \\ 5 \bullet 630 \\ 5 \bullet 589 \\ 5 \bullet 553 \\ \end{array}$	18 58.04 16.37 10.98 9.028 8.030 7.426 6.510 6.510 6.339 6.202 6.339 6.202 6.339 6.202 6.339 5.995 5.915 5.846 5.734 5.647 5.610	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097 6.802 6.265 6.151 6.055 5.974 5.843 5.790 5.743 5.701 5.663
n           1           2           3           4           5           6           7           8           9           10           11           12           13           14           15           16           17           18           19           20	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054 5.867 5.722 5.605 5.511 5.431 5.364 5.256 5.212 5.174 5.256 5.212 5.174 5.140 5.108	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175 5.983 5.833 5.615 5.533 5.463 5.463 5.463 5.463 5.463 5.307 5.267 5.267 5.199	13 53.20 15.08 10.15 8.373 7.466 6.917 6.550 6.287 6.089 5.935 5.554 5.439 5.439 5.439 5.352 5.315 5.282	14 54.33 15.38 10.35 8.525 7.596 7.034 6.658 6.389 6.186 6.028 5.901 5.798 5.711 5.637 5.520 5.471 5.520 5.471 5.520 5.471 5.357	$4 \cdot 030$ 15 $55 \cdot 36$ $15 \cdot 65$ $10 \cdot 53$ $8 \cdot 664$ $7 \cdot 717$ $7 \cdot 143$ $6 \cdot 759$ $6 \cdot 483$ $6 \cdot 276$ $6 \cdot 114$ $5 \cdot 984$ $5 \cdot 789$ $5 \cdot 714$ $5 \cdot 593$ $5 \cdot 544$ $5 \cdot 593$ $5 \cdot 5427$ $5 \cdot 427$	16 56.32 15.91 10.69 8.794 7.828 7.828 7.828 6.852 6.571 6.359 6.194 6.062 5.953 5.862 5.786 5.786 5.786 5.528 5.528 5.528	17 57.22 16.14 10.84 8.914 7.338 6.939 6.653 6.437 6.269 6.134 6.269 6.134 5.852 5.727 5.675 5.630 5.589 5.553	4.387 18 58.04 16.37 10.98 9.028 8.030 7.426 7.426 7.420 6.510 6.339 6.202 6.339 6.202 6.339 5.995 5.915 5.846 5.734 5.647 5.610	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097 6.802 6.265 6.151 6.055 5.974 5.904 5.843 5.790 5.743 5.701 5.663
n           1           2           3           4           5           6           7           8           9           10           11           12           13           14           15           16           17           18           19           20           24           30	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054 5.722 5.605 5.511 5.431 5.364 5.256 5.212 5.174 5.140 5.108 5.012 4.917	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175 5.9833 5.433 5.463 5.463 5.463 5.463 5.463 5.463 5.267 5.267 5.261 5.199 5.099 5.099 5.001	13 53.20 15.08 10.15 8.373 7.466 6.917 6.550 6.287 6.089 5.935 5.439 5.439 5.439 5.439 5.439 5.439 5.439 5.352 5.439 5.282 5.282 5.282	14 54.33 15.38 10.35 8.525 7.596 7.034 6.658 6.389 6.186 6.028 5.901 5.798 5.711 5.637 5.574 5.520 5.471 5.429 5.391 5.357 5.251 5.251 5.147	4.030 15 55.36 15.65 10.53 8.664 7.717 7.143 6.759 6.483 6.276 6.483 6.276 6.483 6.276 5.789 5.714 5.6593 5.544 5.501 5.462 5.4427 5.319 5.211	16 56.32 15.91 10.69 8.794 7.828 7.828 6.852 6.571 6.359 6.194 6.062 5.953 5.862 5.786 5.786 5.786 5.568 5.568 5.493 5.381 5.381 5.271	17 57.22 16.14 10.84 8.914 7.338 6.939 6.653 6.437 6.269 6.134 6.023 5.931 5.852 5.785 5.727 5.675 5.630 5.589 5.553 5.439 5.327	4.387 18 58.04 16.37 10.98 9.028 8.030 7.426 7.426 7.426 6.339 6.202 6.339 6.202 6.339 5.995 5.915 5.846 5.734 5.688 5.610 5.494 5.379	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097 6.802 6.579 6.405 6.265 6.405 5.974 5.904 5.904 5.974 5.904 5.663 5.545 5.429
v         n           1         2           3         4           5         6           7         8           9         10           11         12           13         14           15         16           17         18           19         20           24         30           40         40	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054 5.867 5.722 5.605 5.511 5.364 5.306 5.256 5.512 5.174 5.140 5.108 5.012 4.917 4.824	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175 5.983 5.833 5.615 5.533 5.463 5.404 5.352 5.307 5.267 5.231 5.199 5.099 5.099 5.099	13 53.20 15.08 10.15 8.37.3 7.466 6.917 6.550 6.287 6.089 5.935 5.625 5.554 5.625 5.554 5.439 5.352 5.355 5.282 5.315 5.282 5.179 5.077	$\begin{array}{c} 3 \cdot 8 3 \\ 3 \cdot 8 3 \\ 5 \cdot 3 \\ 5 \cdot 3 \\ 10 \cdot 3 \\ 5 \cdot 3 \\ 8 \cdot 5 \\ 2 \cdot 5 \\ 7 \cdot 5 \\ 9 \\ 6 \cdot 1 \\ 3 \\ 6 \cdot 3 \\ 8 \\ 7 \\ 5 \cdot 5 \\ 1 \\ 1 \\ 5 \cdot 4 \\ 1 \\ 5 \cdot 2 \\ 5 \\ 5 \\ 5 \\ 5 \\ 5 \\ 5 \\ 5 \\ 5 \\ 5 \\$	4.030 15 55.36 15.65 10.53 8.664 7.717 7.143 6.759 6.483 6.276 6.114 5.984 5.789 5.714 5.649 5.544 5.501 5.462 5.544 5.501 5.462 5.544 5.501 5.462 5.544 5.501 5.462 5.5427 5.319 5.211 5.106	4.170 16 56.32 15.91 10.69 8.794 7.8248 6.852 6.571 6.359 6.194 6.062 5.953 5.862 5.786 5.720 5.662 5.612 5.612 5.612 5.612 5.568 5.528 5.493 5.381 5.273	17 57.22 16.14 10.84 8.914 7.338 6.939 6.653 6.437 6.269 6.134 6.023 5.931 5.852 5.785 5.727 5.630 5.553 5.439 5.439 5.439 5.216	4.387 18 58.04 16.37 10.98 9.028 8.030 7.426 7.020 6.729 6.510 6.339 6.202 6.029 5.915 5.846 5.734 5.688 5.647 5.494 5.366	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097 6.802 6.579 6.405 6.265 6.151 6.055 5.974 5.904 5.974 5.904 5.790 5.743 5.701 5.663 5.545 5.5429 5.313
n           1           2           3           4           5           6           7           8           9           10           11           12           13           14           15           16           17           18           19           20           24           30           40           60	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054 5.867 5.722 5.605 5.511 5.431 5.431 5.431 5.431 5.431 5.256 5.212 5.174 5.140 5.108 5.012 4.917 4.824 4.732	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175 5.983 5.833 5.404 5.983 5.533 5.463 5.404 5.352 5.404 5.352 5.404 5.267 5.231 5.199 5.099 5.001 4.904 4.808	13 53.20 15.08 10.15 8.373 7.466 6.917 6.550 6.287 6.287 6.287 5.935 5.811 5.625 5.493 5.493 5.392 5.315 5.282 5.315 5.282 5.179 5.077 4.878	$\begin{array}{c} 3 \cdot 8 > 8 \\ \hline 14 \\ 54 \cdot 33 \\ 15 \cdot 38 \\ 10 \cdot 35 \\ 8 \cdot 525 \\ 7 \cdot 596 \\ 7 \cdot 034 \\ 6 \cdot 658 \\ 6 \cdot 38 \\ 5 \cdot 701 \\ 5 \cdot 793 \\ 5 \cdot 711 \\ 5 \cdot 637 \\ 5 \cdot 771 \\ 5 \cdot 793 \\ 5 \cdot 711 \\ 5 \cdot 637 \\ 5 \cdot 574 \\ 5 \cdot 520 \\ 5 \cdot 74 \\ 5 \cdot 520 \\ 5 \cdot 521 \\ 5 \cdot 147 \\ 5 \cdot 044 \\ 4 \cdot 942 \\ \end{array}$	$4 \cdot 030$ 15 $55 \cdot 36$ $15 \cdot 65$ $10 \cdot 53$ $8 \cdot 664$ $7 \cdot 717$ $7 \cdot 143$ $6 \cdot 759$ $6 \cdot 483$ $6 \cdot 276$ $6 \cdot 114$ $5 \cdot 984$ $5 \cdot 878$ $5 \cdot 789$ $5 \cdot 789$ $5 \cdot 593$ $5 \cdot 544$ $5 \cdot 593$ $5 \cdot 544$ $5 \cdot 501$ $5 \cdot 462$ $5 \cdot 427$ $5 \cdot 319$ $5 \cdot 211$ $5 \cdot 106$ $5 \cdot 001$	4.170 16 56.32 15.91 10.69 8.794 7.828 7.244 6.852 6.359 6.194 6.062 5.953 5.862 5.720 5.662 5.528 5.493 5.381 5.271 5.165	17 57.22 16.14 10.84 8.914 7.932 7.338 6.939 6.653 6.437 6.269 6.134 6.023 5.931 5.852 5.785 5.727 5.630 5.589 5.553 5.439 5.327 5.216 5.107	4.387 18 58.04 16.37 10.98 9.028 8.030 7.426 7.426 7.420 6.510 6.339 6.202 6.520 6.339 6.202 6.089 5.915 5.846 5.784 5.688 5.647 5.610 5.494 5.379 5.266	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097 6.802 6.579 6.405 6.265 6.151 6.055 5.904 5.843 5.790 5.743 5.701 5.663 5.545 5.429 5.313 5.199
n           1           2           3           4           5           6           7           8           9           10           11           12           13           14           15           16           17           18           19           20           24           30           40           60           120	11 50.59 14.39 9.717 8.027 7.168 6.649 6.302 6.054 5.867 5.722 5.605 5.511 5.431 5.364 5.366 5.212 5.314 5.306 5.212 5.140 5.108 5.012 4.917 4.824 4.732 4.641	12 51.96 14.75 9.946 8.208 7.324 6.789 6.431 6.175 5.982 5.833 5.615 5.533 5.463 5.463 5.463 5.404 5.352 5.307 5.231 5.199 5.009 5.001 4.904 4.808 4.714	13 53.20 15.08 10.15 8.373 7.466 6.917 6.550 6.287 6.287 6.287 5.935 5.811 5.625 5.5543 5.439 5.392 5.315 5.282 5.315 5.282 5.179 5.077 4.977 4.878	$\begin{array}{c} 3 \cdot 8 28 \\ \hline 14 \\ 54 \cdot 33 \\ 15 \cdot 38 \\ 10 \cdot 35 \\ 8 \cdot 525 \\ 7 \cdot 596 \\ 7 \cdot 034 \\ 6 \cdot 658 \\ 6 \cdot 389 \\ 6 \cdot 186 \\ 6 \cdot 028 \\ \hline 5 \cdot 901 \\ 5 \cdot 793 \\ 5 \cdot 711 \\ 5 \cdot 637 \\ 5 \cdot 574 \\ 5 \cdot 520 \\ 5 \cdot 471 \\ 5 \cdot 520 \\ 5 \cdot 429 \\ 5 \cdot 357 \\ \hline 5 \cdot 251 \\ 5 \cdot 357 \\ \hline 5 \cdot 251 \\ 5 \cdot 147 \\ 5 \cdot 044 \\ 4 \cdot 942 \\ 4 \cdot 842 \\ \hline \end{array}$	$4 \cdot 030$ 15 $55 \cdot 36$ $15 \cdot 65$ $10 \cdot 53$ $8 \cdot 664$ $7 \cdot 717$ $7 \cdot 143$ $6 \cdot 759$ $6 \cdot 483$ $6 \cdot 276$ $6 \cdot 114$ $5 \cdot 984$ $5 \cdot 789$ $5 \cdot 714$ $5 \cdot 649$ $5 \cdot 593$ $5 \cdot 544$ $5 \cdot 501$ $5 \cdot 106$ $5 \cdot 001$ $4 \cdot 898$	4.170 16 56.32 15.91 10.69 8.794 7.828 6.359 6.194 6.062 5.953 5.862 5.720 5.662 5.720 5.662 5.528 5.5558 5.528 5.55585 5.55585 5.55585 5.5558 5.55585 5.55585 5.555858 5.5558558	17 57.22 16.14 10.84 8.914 7.338 6.939 6.653 6.437 6.269 6.134 6.023 5.931 5.852 5.727 5.675 5.630 5.539 5.553 5.439 5.327 5.216 5.107 4.998	4.387 18 58.04 16.37 10.98 9.028 8.030 6.202 6.510 6.339 6.202 6.202 6.339 6.202 6.089 5.995 5.915 5.846 5.734 5.610 5.494 5.379 5.264 5.154	19 58.83 16.57 11.11 9.134 8.122 7.508 7.097 6.802 6.265 6.151 6.055 5.974 5.843 5.790 5.843 5.791 5.663 5.545 5.429 5.313 5.199 5.086

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### RANGE AND STUDENTIZED RANGE TABLES

#### TABLE 3 (Continued)

P = •95

$\begin{array}{c c c c c c c c c c c c c c c c c c c $	y n	20	22	24	26	28	30	32	34	36
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	<u></u>	20		27				26		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	1	59.56	60.91	62.12	63.22	64.23	65.15	66.01	66.81	67.56
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	2	16.77	17.13	17.45	17.75	18.02	18.27	18.50	18.72	18.92
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	3	11.24	11.47	11.68	11.87	12.05	12.21	12.36	12.50	12.63
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	4	9.233	9.418	9.584	9.736	9.875	10.00	10.12	10.23	10.34
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	5	8.208	8.368	8.512	8.643	8.764	8.875	8.979	9.075	9.165
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	7	7 170	7 202	7 402	7 522	7 624	7.720	8.283	7 005	7 072
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	8	6.870	6.995	7.109	7.212	7.307	7.395	7.477	7.554	7.625
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	9	6.644	6.763	6.871	6.970	7.061	7.145	7.222	7.295	7.363
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	10	6.467	6.582	6.686	6.781	6.868	6.948	7.023	7.093	7.159
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		ν						·		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	11	6.326	6.436	6.536	6.628	6.712	6.790	6.863	6.930	6.994
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	12	6.209	6.317	6.414	6.503	6.585	6.660	6.731	6.796	6.858
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	13	6.112	6.217	6.312	6.398	6.478	6.551	6.620	6.684	6.744
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	14	6.029	6.132	6.224	6.309	6.387	6.459	6.526	6.588	.6.641
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	15	5.995	5.0059	6 084	6.166	6.241	6.210	6.274	6 436	6.401
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	17	5.842	5.940	6.027	6.107	6.181	6.249	6.313	6.372	6.427
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	18	5.794	5.890	5.977	6.055	6.128	6.195	6.258	6.316	6.371
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	19	5.752	5.846	5.932	6.009	6.081	6.147	6.209	6.267	6.321
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	20	5.714	5.807	5.891	5.968	6.039	6.104	6.165	6.222	6.275
$\begin{array}{c c c c c c c c c c c c c c c c c c c $										
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	24	5.594	5.683	5.764	5.838	5.906	5.968	6.027	6.081	6.132
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	30	5.475	5.561	5.638	5.709	5.774	5.833	5.889	5.941	5.990
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	40	5.358	5.439	5.513	5.581	5.642	5.700	5.753	5.803	5.849
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	60	5.241	5.319	5.389	5.453	5.302	5.636	5.611	5.524	5.548
$\nu$ n38405060708090100168.2668.9271.7373.9775.8277.4078.7779.98219.1119.2820.0520.6621.1621.5921.9622.29312.7512.8713.3613.7614.0814.3614.6114.82410.4410.5310.9311.2411.5111.7311.9212.0959.2509.3309.6749.94910.1810.3810.5410.6968.5298.6018.9139.1639.3709.5489.7029.83978.0438.1108.4008.6328.8248.9899.1339.26187.6937.7568.0298.2488.9818.1668.526107.2207.2797.5297.7307.8978.0418.1668.276117.0537.1107.3527.5467.7087.8477.9688.075126.9166.9707.2057.3947.5527.6677.769146.67546.9797.1597.3097.4437.9527.6677.769156.6186.6696.8887.0657.2127.3397.4497.546166.5446.5946.8106.9247.1287.2527.3007.453176.4796.5296.7416.9127.0547.1677.233 <td>×20</td> <td>5.012</td> <td>5.081</td> <td>5.144</td> <td>5.201</td> <td>5.253</td> <td>5.301</td> <td>5.346</td> <td>5.388</td> <td>5.427</td>	×20	5.012	5.081	5.144	5.201	5.253	5.301	5.346	5.388	5.427
$\nu$ n38405060708090100168.2668.9271.7373.9775.8277.4078.7779.98219.1119.2820.0520.6621.1621.5921.9622.29312.7512.8713.3613.7614.0814.3614.6114.82410.4410.5310.9311.2411.5111.7311.9212.0959.2509.3309.6749.94910.1810.3810.5410.6968.5298.6018.9139.1639.3709.5489.7029.83978.0438.1108.4008.6328.8248.9899.1339.26187.6937.7568.0298.2488.4308.5668.7228.84397.4287.4887.7497.9588.1328.2818.4108.526107.2207.2797.5297.7307.8978.0418.1668.276117.0537.1107.3527.6547.7087.8477.9688.075126.9166.9707.2057.3947.5527.6677.769146.7026.7546.9797.1597.3037.4217.5527.667156.6186.6696.8887.0657.2127.3397.4497.546166.5446.5946.8106.9247.1287.225<	-									
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12 $6 \cdot 916$ $6 \cdot 970$ $7 \cdot 205$ $7 \cdot 394$ $7 \cdot 552$ $7 \cdot 667$ $7 \cdot 804$ $7 \cdot 909$ 13 $6 \cdot 800$ $6 \cdot 854$ $7 \cdot 083$ $7 \cdot 267$ $7 \cdot 421$ $7 \cdot 552$ $7 \cdot 667$ $7 \cdot 769$ 14 $6 \cdot 702$ $6 \cdot 754$ $6 \cdot 979$ $7 \cdot 159$ $7 \cdot 309$ $7 \cdot 438$ $7 \cdot 552$ $7 \cdot 667$ $7 \cdot 769$ 15 $6 \cdot 618$ $6 \cdot 669$ $6 \cdot 888$ $7 \cdot 065$ $7 \cdot 212$ $7 \cdot 339$ $7 \cdot 449$ $7 \cdot 546$ 16 $6 \cdot 544$ $6 \cdot 594$ $6 \cdot 810$ $6 \cdot 984$ $7 \cdot 128$ $7 \cdot 252$ $7 \cdot 360$ $7 \cdot 457$ 17 $6 \cdot 479$ $6 \cdot 529$ $6 \cdot 741$ $6 \cdot 912$ $7 \cdot 054$ $7 \cdot 176$ $7 \cdot 283$ $7 \cdot 377$ 18 $6 \cdot 422$ $6 \cdot 471$ $6 \cdot 680$ $6 \cdot 872$ $6 \cdot 930$ $7 \cdot 048$ $7 \cdot 152$ $7 \cdot 244$ 20 $6 \cdot 325$ $6 \cdot 373$ $6 \cdot 576$ $6 \cdot 792$ $6 \cdot 930$ $7 \cdot 048$ $7 \cdot 152$ $7 \cdot 244$ 20 $6 \cdot 325$ $6 \cdot 373$ $6 \cdot 576$ $6 \cdot 740$ $6 \cdot 877$ $6 \cdot 994$ $7 \cdot 008$ 30 $6 \cdot 037$ $6 \cdot 080$ $6 \cdot 267$ $6 \cdot 417$ $6 \cdot 543$ $6 \cdot 650$ $6 \cdot 744$ $6 \cdot 827$ 40 $5 \cdot 893$ $5 \cdot 934$ $6 \cdot 112$ $6 \cdot 576$ $6 \cdot 776$ $6 \cdot 776$ $6 \cdot 6477$ $6 \cdot 6566$ $6 \cdot 645$ 120 $5 \cdot 607$ $5 \cdot 644$ $5 \cdot 802$ $5 \cdot 929$ $6 \cdot 035$ $6 \cdot 126$ $6 \cdot 205$ $6 \cdot 275$	2 3 4 5 6 7 8 9 10	38 68.26 19.11 12.75 10.44 9.250 8.043 7.693 7.428 7.220	40 68.92 19.28 12.87 10.53 9.330 8.601 8.110 7.756 7.488 7.279	50 71.73 20.05 13.36 10.93 9.674 8.913 8.400 8.029 7.749 7.529	60 73.97 20.66 13.76 11.24 9.949 9.163 8.632 8.248 7.958 7.730	70 75.82 21.16 14.08 11.51 10.18 9.370 8.824 8.430 8.132 7.897	80 77.40 21.59 14.36 11.73 10.38 9.548 8.989 8.586 8.281 8.041	90 78.77 21.96 14.61 11.92 10.54 9.702 9.133 8.722 8.410 8.166	100 79•98 22•29 14•82 12•09 10•69 9•839 9•261 8•843 8•526 8•276	
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30         6.037         6.080         6.267         6.417         6.543         6.650         6.744         6.827           40         5.893         5.934         6.112         6.255         6.375         6.477         6.566         6.645           60         5.750         5.789         5.958         6.093         6.206         6.303         6.387         6.462           120         5.607         5.644         5.802         5.929         6.035         6.126         6.205         6.275	ν 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	38 68 • 26 19 • 11 12 • 75 10 • 44 9 • 250 8 • 529 8 • 043 7 • 693 7 • 428 7 • 693 7 • 428 7 • 220 7 • 053 6 • 916 6 • 800 6 • 702 6 • 618 6 • 544 6 • 479 6 • 422 6 • 371 6 • 325	40 68.92 19.28 12.87 10.53 9.330 8.601 8.110 7.756 7.488 7.279 7.110 6.854 6.754 6.529 6.529 6.471 6.419 6.373	50 71.73 20.05 13.36 10.93 9.674 8.913 8.400 8.029 7.749 7.529 7.352 7.205 7.083 6.979 6.888 6.810 6.741 6.680 6.626 6.576	60 73.97 20.66 13.76 11.24 9.949 9.163 8.632 8.632 8.632 8.632 8.632 8.632 8.632 8.7958 7.958 7.958 7.730 7.5546 7.394 7.267 7.159 7.065 6.912 6.848 6.792 6.740	70 75.82 21.16 14.08 11.51 10.18 9.370 8.824 8.430 8.430 8.430 8.430 7.897 7.708 7.552 7.421 7.309 7.212 7.212 7.054 6.989 6.930 6.877	80 77.40 21.59 14.36 11.73 9.548 8.989 8.586 8.281 8.041 7.847 7.6552 7.438 7.339 7.2552 7.438 7.176 7.109 7.109 7.109	90 78.77 21.96 14.61 11.92 9.133 8.722 8.410 8.166 7.968 7.804 7.550 7.449 7.550 7.449 7.283 7.213 7.152 7.097	100 79.98 22.29 14.82 12.09 9.839 9.261 8.843 8.526 8.8276 8.8276 7.546 7.546 7.546 7.546 7.546 7.546 7.546 7.546 7.546 7.5377 7.3377 7.3377	
40         5.893         5.934         6.112         6.255         6.375         6.477         6.566         6.6645           60         5.750         5.789         5.958         6.093         6.206         6.303         6.387         6.462           120         5.607         5.644         5.802         5.929         6.035         6.126         6.205         6.275	ν 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 24	38 68 • 26 19 • 11 12 • 75 10 • 44 9 • 250 8 • 529 8 • 043 7 • 693 7 • 428 7 • 220 7 • 053 6 • 916 6 • 800 6 • 702 6 • 618 6 • 544 6 • 479 6 • 422 6 • 371 6 • 325 6 • 181	40 68.92 19.28 12.87 10.53 9.330 8.601 8.110 7.756 7.488 7.279 7.110 6.970 6.854 6.594 6.594 6.594 6.419 6.373 6.226	50 71.73 20.05 13.36 10.93 9.674 8.913 8.400 8.029 7.749 7.529 7.352 7.205 7.083 6.979 6.888 6.810 6.741 6.680 6.626 6.576 6.421	60 73.97 20.66 13.76 11.24 9.949 9.163 8.248 7.958 7.958 7.958 7.730 7.546 7.394 7.267 7.159 7.065 6.912 6.848 6.792 6.740 6.579	70 75.82 21.16 14.08 11.51 10.18 9.370 8.824 8.430 8.430 8.430 8.430 7.552 7.405 7.405 7.405 7.212 7.128 7.054 7.059 9.212 7.128 7.059 9.6.930 6.930 6.9710	80 77.40 21.59 14.36 11.73 9.548 8.989 8.586 8.281 8.041 7.847 7.652 7.438 7.438 7.438 7.438 7.438 7.4176 6.822	90 78.77 21.96 14.61 11.92 9.702 9.133 8.722 9.133 8.722 8.410 8.166 7.968 7.804 7.650 7.449 7.350 7.449 7.350 7.449 7.350 7.4213 7.152 7.097 6.920	100 79.98 22.29 14.82 12.09 9.839 9.261 8.843 8.526 8.526 8.526 8.526 8.526 8.526 7.509 7.650 7.546 7.457 7.556 7.546 7.546 7.377 7.307 7.307 7.2244 7.187	
60         56750         56789         56958         66953         66205         65305         65387         64462           120         5607         5644         5802         5929         66035         66126         66205         66275	ν 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 24 30	38 68 • 26 19 • 11 12 • 75 10 • 44 9 • 250 8 • 529 8 • 043 7 • 693 7 • 428 7 • 220 7 • 053 6 • 916 6 • 800 6 • 702 6 • 618 6 • 544 6 • 479 6 • 422 6 • 371 6 • 325 6 • 181 6 • 037	40 68.92 19.28 12.87 10.53 9.330 8.601 8.110 7.756 7.488 7.279 7.110 6.970 6.970 6.6597 6.6594 6.529 6.471 6.419 6.373 6.226 6.080	50 71.73 20.05 13.36 10.93 9.674 8.913 8.400 8.029 7.749 7.529 7.352 7.083 6.979 6.888 6.810 6.741 6.680 6.626 6.576 6.421 6.267	60 73.97 20.66 13.76 11.24 9.949 9.163 8.248 7.958 7.958 7.958 7.958 7.9546 7.394 7.267 7.159 7.065 6.984 6.912 6.848 6.792 6.844 6.792 6.579 6.417	70 75.82 21.16 14.08 11.51 10.18 9.370 8.8430 8.430 7.552 7.421 7.708 7.552 7.421 7.552 7.421 7.212 7.212 7.212 7.2128 7.0549 6.930 6.877 6.710 6.543	80 77.40 21.59 14.36 11.73 10.38 9.548 8.989 8.589 8.281 8.041 7.847 7.552 7.438 7.339 7.252 7.438 7.438 7.438 7.438 7.438 7.438 7.438 7.438 7.438 7.438 7.438 7.438 7.438 7.438 7.438 7.438 7.440 7.440 7.440 7.459 7.458 7.457 7.458 7.457 7.458 7.457 7.458 7.457 7.458 7.457 7.458 7.457 7.458 7.457 7.458 7.457 7.458 7.457 7.458 7.457 7.458 7.457 7.458 7.4577 7.4577 7.4577 7.45777 7.457777 7.457777777777	90 78+77 21+96 14+61 11+92 10+54 9+702 9+133 8+722 8+410 8+166 7+968 7+804 7+667 7+550 7+449 7+360 7+283 7+213 7+152 7+097 6+920 6+744	100 79.98 22.29 14.82 12.09 9.839 9.261 8.526 8.526 8.526 8.276 8.075 7.650 7.650 7.650 7.650 7.650 7.457 7.307 7.244 7.187 7.008 6.827	
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≪ 1 5+463 15+498 15+646 15+764 15+863 15+947 16+020 16+085 1	ν 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 24 30 40 60 120	38 68 • 26 19 • 11 12 • 75 10 • 44 9 • 250 8 • 529 8 • 043 7 • 693 7 • 428 7 • 220 7 • 053 6 • 916 6 • 800 6 • 702 6 • 618 6 • 325 6 • 181 6 • 325 6 • 181 6 • 037 5 • 893 5 • 750 6 • 607	40 68.92 19.28 12.87 10.53 9.330 8.601 8.110 7.756 7.488 7.279 7.110 6.854 6.659 6.529 6.529 6.471 6.419 6.373 6.226 6.080 6.934 5.934	50 71.73 20.05 13.36 10.93 9.674 8.913 8.400 8.029 7.749 7.529 7.352 7.205 7.205 7.205 7.205 7.205 7.205 7.205 6.888 6.810 6.626 6.626 6.626 6.626 6.576 6.421 6.267 6.112 5.958 5.802	60 73.97 20.66 13.76 11.24 8.632 8.632 8.632 8.632 8.632 8.632 8.632 8.632 8.632 8.632 8.632 8.632 8.632 8.632 8.632 7.958 7.959 7.065 6.994 6.912 6.994 6.912 6.994 6.912 6.994 6.972 6.979 6.579 6.255 6.093 6.903	70 75.82 21.16 14.08 11.51 10.18 9.370 8.824 8.430 8.430 8.132 7.897 7.708 7.552 7.421 7.309 7.212 7.205 6.989 6.930 6.877 6.543 6.375 6.205	80 77.40 21.59 14.36 11.73 9.548 8.989 8.586 8.281 8.041 7.847 7.4552 7.438 7.339 7.252 7.438 7.339 7.252 7.176 7.109 7.048 6.994 6.822 6.650 6.477 6.303	90 78.77 21.96 14.61 11.92 9.133 8.722 8.410 8.122 8.410 8.166 7.968 7.864 7.667 7.449 7.360 7.4283 7.213 7.213 7.23 7.697 6.920 6.744 6.566 6.387 6.205	100 79.98 22.29 14.82 12.09 9.261 8.843 8.526 8.8276 8.675 7.909 7.546 7.546 7.457 7.377 7.377 7.307 7.546 7.457 7.377 7.307 7.546 5.827 6.645 6.827 6.645 6.462	

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