EDU-WARE ®

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If you believe
that the development
of Learning Software
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a task demanding rigor
and professionalism...
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of Edu-Ware.

STATISTICS 3.0

Applesoft, 48K, DOS 3.2 or 3.3

APPLE II
DISC

At Edu-Ware Services, a team of experienced professionals is firmly committed to producing educational software of unparalled design and quality.

Today, it is essential that individuals develop and sharpen their problem-solving capabilities. Edu-Ware products are directed at building core intellectual skills — reading, mathematics, and spelling. Edu-Ware is both versatile and rigorous. It finds effective application in the home or classroom, and often may be elegantly tailored to the needs of young, remedial, or adult learners. Edu-Ware's subsidiary line, Interactive Fantasies (IFs), represent a distinct genre in entertainment software. Interactive Fantasies have been designed expressly to foster divergent thinking (creative problem-solving) through the intellectual challenge of role-playing.

Edu-Ware Services, a California-based corporation, was established in 1979, when the microcomputer industry was still in its infancy. Since that time, Edu-Ware and Interactive Fantasies have earned a sound reputation among dealers and end users.

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PROBLEMS?

Edu-Ware products are supported after sale by a 30-day Limited Warranty, rapid service, and low-cost updates and replacements.

Should you encounter problems with a system or its operation, feel free to contact an Edu-Ware service representative at (213) 706-0661. If our service staff cannot alleviate the trouble over the phone, you may simply complete the enclosed service form and mail it with your diskette to Edu-Ware's Service Department. If your service requires payment, please include a check or money order.

★ ★ ★ ★ ★ ★

Often program errors result from a defective disk drive, not the software. When you do have trouble, compare the operation of several commercial software programs you may own. If the trouble is consistent, consult your computer dealer.

Edu-Ware's warranty is null and void if the user has modified the program, physically damaged the diskette, or obtained the product through an unauthorized or illegal distribution channel.

Edu-Ware Services reserves the right to make improvements in its products at any time, without notice, and to replace any defective products with improved versions. The company is not responsible for the suitability of its products to the user's application; this is the purchaser's responsibility.

Any incidental and consequential damages caused by malfunction or by breach of warranty (expressed or implied) are not the responsibility of Edu-Ware Services, Inc. Such damages are excluded from both property damage and personal injury liability claims. Some states do not allow exclusion of incidental or consequential damages, so the above may not apply to all users.

Edu-Ware is a registered trademark of Edu-Ware Services, Inc.

STATISTICS 3.0

Both powerful and flexible, STATISTICS 3.0 provides teachers, university students, and scientific and technical professionals with the means to quantify and evaluate mathematical relationships.

This system generates six calculation routines:

- ★ Mean, Variance, and Standard Deviation
- ★ Pearson Product Moment Correlation
- ★ Normal Distribution-Probability and Frequency
- ★ Chi-square Distribution
- ★ Chi-square Test
- ★ T-test.

STATISTICS 3.0 features interactive menus which grant the user maximum control in setting calculations. The user can save data to text file; edit or modify data as needed; and build new files at the touch of a key. Direct access to any slot-controlled printer allows hard-copy printouts of all data.

Comprehensive documentation illustrates all procedures and gives an overview of each statistic employed.

EDU-WARE

3.8

STATISTICS 3.0™

© Copyright, 1979 Edu-Ware Services, Inc.
Requires 48K Applesoft

EW010-AP2

EDU-WARE®

interactive fantasies™

EDU-WARE SERVICES, INC.
P.O. BOX 22222 ✳ AGOURA, CA 91301

For extended media life—
here's how to take care of your flexible disk

Precision surface. No fingers, please!

For your disk's sake (and the system's, too) Insert disk carefully.

Magnetic fields erase. Keep them far away

Keep it safe— in the envelope when not in use.

Bending and folding may damage. Handle with care.

Keep disks comfortable. Store at: 10° to 50° C. 50° to 125° F.

PROBLEMS?

Edu-Ware is firmly committed to supporting the users of its products. This support consists of a 30-day limited warranty, followed by unlimited low-cost service and updates. Note that the Edu-Ware Warranty applies equally to both "glitches" (bad media problems) and "bugs" (program errors).

Regardless of the nature of your problem, we would ask you to use the form on the back of this page in addressing our Service Department. In the event that charges are in order, please accompany your service request with a check or money order, otherwise your return shipment will be sent via U.P.S., C.O.D. Please note that in all cases, you must include your original serialed program diskette as proof of purchase. (However, we normally replace it with a fresh diskette.)

IMPORTANT NOTE:

Many program errors are the result of a defective disk drive, and not program "bugs" or "glitches." Whenever you experience software trouble, you should compare the results of the various commercial software packages you may own. If you consistently find trouble, consult your computer dealer.

EDU-WARE 30-DAY LIMITED WARRANTY

Edu-Ware Services, Inc. warrants this software package to operate within all specifications contained in its accompanying documentation. Should this package fail to meet its specifications within 30 days of purchase by the end user, Edu-Ware Services, Inc. will, at its sole discretion:

1. Correct the failure, by replacement of the defective or error-laden media, upon receipt of the defective program diskette, proof of purchase date, and written description of the problem.

–OR–

2. Refund the original purchase price, upon receipt of the defective program, documentation and accompanying materials.

This warranty is null and void in cases where the user has attempted to make modifications in the program, physically damaged the program diskette, or obtained the product through an unauthorized or illegal distribution channel.

Edu-Ware Services, Inc. will assume no responsibility for the suitability of its products to the user's application. The purchaser must assume a responsibility for the suitability of the application. EduWare Services, Inc. reserves the right to make improvements in its products at anytime without notice, and to replace any defective products with improved versions.

Incidental and consequential damages caused by the malfunction, defect or otherwise, and with respect to the breach of any expressed or implied warranty are not the responsibility of Edu-Ware Services, Inc., and to the extent permitted by law, are hereby excluded both for property damage, and to the extent not unconscionable, for personal injury damage. Some states do not allow the exclusion of incidental or consequential damages, so the above may not apply to all users.

SERVICE REQUEST FORM
EDU-WARE SERVICES, INC.

P.O. Box 22222
Agoura, Ca. 91301

Product: _____   Media: _____

System: _____

SERVICE	AMOUNT	AMOUNT ENCLOSED
Warranty Service	(no charge)	
Defective Media/Update	$5.00	
Shipping	$2.00 unless covered by warranty	
5. TOTAL (enclose check or C.O.D. charges will be added)		

6. DESCRIPTION OF PROBLEM (Be as complete as possible. Use separate sheets if necessary. If applicable, be sure to specifically describe the operation you were performing when the failure occurred.)
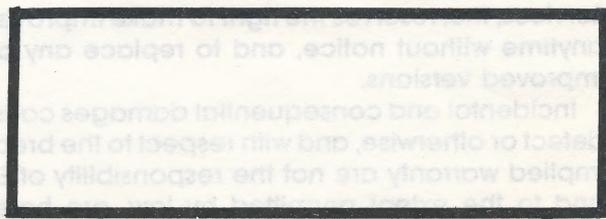
_____

_____

_____

7. Purchased From: _____   8. Date: _____

9. Please use this space for your address. It will be used as a mailing label (include zip code).

10. TELEPHONE #:

( ) _____

EDU-WARE ®

STATISTICS 3.0 ™

STATISTICS 3.0 Program and Documentation
(C) COPYRIGHT 1980 EDU-WARE SERVICES, INC.

ACKNOWLEDGEMENTS

STATISTICS 3.0 was developed exclusively by Edu-Ware Services, Inc., a California software development company dedicated to the production of instructionally valid C.A.I. and intellectually challenging games.

It took the efforts of a number of individuals to bring this product to fruition:

Sherwin Steffin developed the original coding for Version 1.0 and the later revised Version 2.0. He also provided system design, and display specifications for this completely new Version 3.0, as well as writing the documentation for all three versions.

David Mullich coded the new programs in their entirety, debugged, and conducted system testing, as well as initiating the design of the new graphic displays.

Steven Pederson developed the Edu-Ware high-resolution (upper and lower case) font used throughout these programs and served as a consultant in the revision of the system.

Scott Clapp conducted all system testing for accuracy of the routines and made a number of accuracy-oriented corrections.

STATISTICS
VERSION 3.0
User Documentation

TABLE OF CONTENTS

I. INTRODUCTION

1. What is STATISTICS 3.0?

Teachers, university students, and other scientific
and technical professionals need a generalized
statistics system to help them quantify and evaluate
mathematical relationships. Within a university
setting there are normally a number of statistical
packages available to those with computer expertise.
This statistics package was designed for the personal
computer user as an easy substitute for the larger,
more powerful packages which are usually found only
within university or industrial settings.

The six calculation routines generated by this system
were derived from SPSS algorithms used by most
universities.

Statistics contains a number of features which provide
the user with a system characterized by flexibility
and utility.

**   Interactive menus were designed to give the user
     maximum control in setting up the desired
     calculations.

**   An editing mode within each of the routines allows
     the user to immediately access data, and edit or
     modify as needed.

**   Direct access to any slot-controlled printer
     allows hard-copy printouts of all data.

**   Total high-resolution graphics display, including
     upper/lower case text, illustrates relationships
     in many of the routines and offers the user
     maximum clarity of presentation.

** The user may save data to a text file for recall
   and use later. Data may be modified, with new
   files built at the touch of a key.

** Detailed documentation provides the user with
   instructions for each of the sub-routines and
   with an explanation of the statistic employed.

While this documentation provides a general overview
of each statistical routine provided, it is not
intended as a substitute for rigorous training in
statistics. For this, the user is referred to the
many fine text-books and college courses available.

2. Quick and Easy

Some users, who are familiar with the statistics they
want to employ, will wish to use the programs without
pursuing the documentation further. If you are in this
category, follow the steps outlined below:

(A) Boot the diskette. After a few seconds of disk
     activity, an Edu-Ware logo with the STATISTICS
     3.0 identification will appear on the screen.
     Next to display is the STATISTICS 3.0 Master
     Menu.

(B) You will note the Menu which appears on the
     screen. Simply follow the directions and enter
     the data as called for. All directions are self
     explanatory. If you make an error in program
     setup, or wish to go back to the start of any
     indivdual program, press the [ESC] key which
     takes you back to the start of that program.
     Should you make an error in program selection
     press the [RESET] key, which will cause the
     program to re-boot, and once more display the
     Master Menu.

(C) This is still an infant industry and we know that
     errors can creep into our programs, or the media
     can decide it no longer wishes to work. We have
     provided for either contingency by a set of error
     routines which tell you exactly what has gone
     wrong. Please copy the information which appears
     on the screen and follow the directions given to
     you.

3. Using the Documentation

The remainder of this documentation is designed to
give you much greater flexibility in the use of these
programs, with regard to control over your own
learning, and to provide you with an understanding of
the program's design.

You also will find some general comments on the care
and feeding of your diskettes, which can get very
uncooperative at times.   Should a problem occur, be
certain to read the Limited Warranty at the end of
this material, and follow the directions exactly.

II. THE PROGRAMS

Some General Comments

For each of the programs to be described below, we
have included first a description of the use of the
statistic(s), followed by the applications which can
be made of it/them.

Below is a detailed description of the data entry
procedure to be employed and some permutations of the
Menu which provide you maximum flexibility of use.

The Individual Programs

1. Mean, Variance, and Standard Deviation

Mean, Variance, and Standard Deviation are all measures of central tendencies and the degree to which there is variance within a set of data from some central mathematical value.

The Mean is derived by summing individual values and then dividing by the total number of values. The Variance is the sum of the squares of the deviations from the Mean of each of the individual values. The Standard Deviation is the square root of the Variance.

For this program, as in all others, the first screen prompt asks for the source of the data. If the data is coming from the keyboard, enter [0]; if from diskette enter [1]. (Data entry from diskette is described later.)

Values which are being assessed in the Variance or the Standard Deviation may come from either a population or a sample. As soon as the program menu appears on the screen, you are asked to make this determination. If the data is to come from a population, enter [1]; if from a sample enter [2].

Data may be either grouped or ungrouped. Ungrouped data are those in which individual values are entered. Grouped data are those in which the individual values occur with specific frequency. Thus, taking the Mean of a set of test scores is an example of the use of ungrouped data. The use of data from a multi-stratified sample represents an example of grouped data. To the prompt of Grouped/Ungrouped, enter the appropriate number.

The data entry display appears next. If the data was grouped, enter the first datum, and then press [RETURN]. The cursor will move to the second column, where the frequency of the corresponding datum is entered. Pressing [RETURN] after frequency entry results in a repeat of the process for the next datum. If data is ungrouped, data entry occurs only in the first column.

When all data is entered, press the [SPACE BAR]. This will result in the computational results being displayed along with a histogram graphically presenting the numeric data.

For directions for editing, printing, and disk access, see the section entitled USER OPTIONS.

2. Correlation Coefficient (Pearson Product Moment Correlation)

This program provides you the ability to compute a correlation coefficient between two variables. Assumptions are linearity of relationship and an equal number of values in each variable.

Here are some examples of variables which might be correlated (matched together) to determine the extent of the relationship existing between the variables:

> a. Cumulative grades and measured intelligence.
>
> b. Inches of rainfall per a given period correlated with the number of automobile accidents for the same period.
>
> c. The relationship between the number of cigarettes smoked and the incidence of lung cancer.

You should remember that correlation does not imply causation. Two variables may be correlated without one being the cause of the other.

To use this calculation, enter [2] on the Master Menu and select the keyboard option. Then enter each of the X and accompanying Y variable values. When all data entry is complete, press [SPACE BAR] to get the results.

The results will be displayed on the screen, along with a graphic representation of the relationship.

For directions for editing, printing, and disk access, see the section entitled USER OPTIONS.

3. Normal Distribution - Probability and Frequency

This program provides for the calculation of the probability of a value occuring, given the Mean and Standard Deviation and the assumption of a normal distribution. The frequency for any value, given the total observation, is included. Both standard and non-standard distributions may be accommodated, provided both the Mean and Standard Deviation are known.

The Standard Distribution translates scores into "Z" scores. In utilizing the "Z", the Mean is set at 0 (zero) and the Standard Deviation is 1.0 from the Mean.

To use the program, select either the [1] for STANDARD, or [2] for NON-STANDARD distributions.

When this has been done, follow the screen directions to obtain the frequency and probability of occurrence for the entered value.

For directions for editing, printing, and disk access,
see the section entitled USER OPTIONS.

4. The Chi-square Distribution (Tail End and Percentile Values)

Chi-Square is a statistic that determines the
probability that the difference between a series of
expected values and actual values are due to some
cause other than chance. Just as the normal
distribution establishes the probability that some
deviation from a Mean and Standard Deviation occur, so
too, the Chi-square Distribution determines the area
under the curve in which a given value is likely to
occur (see Figure 1 below).

X^2
Chi-square distribution
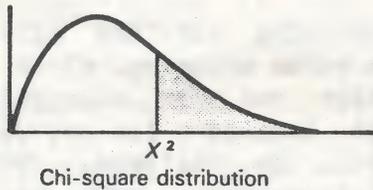
You will notice that the shaded area (the Tail End
Value) represents a value of the distribution beyond
the Chi-square value which is specified. The unshaded
portion (the Percentile value) represents the portion
of the curve accounted for by the Chi-square value.

After selecting [4] Chi-Square Value from the Master
Menu, follow the screen directions to input the
required data.

For directions for editing, printing, and disk access,
see the section entitled USER OPTIONS.

5. Chi-square Test

The Chi-square Test determines the statistical significance of the deviation between expected actual values in a series of "cells". The total number of cells is determined by the product of rows and columns.

Degrees of Freedom (D.F.) is calculated by the formula (R-1) X (C-1). This computation is attended to by the program. After the Chi-square is calculated, use the appropriate D.F. column in a Chi-square significance table to find the level of statistical significance of the derived Chi-square value.

To use the Chi-square program enter [5] Chi-square Test from the Master Menu. As in earlier programs select the KEYBOARD option. Then enter the number of rows and columns. As the cursor appears over the intersection of each row/column, enter the correct value. After the data entry is complete, press [RETURN] to get the D.F., the expected and actual values for each cell, as well as the Chi-square value for these variables. After viewing the values press [RETURN] to move to the appropriate exit routine.

For directions for editing, printing, and disk access, see the section entitled USER OPTIONS.

6. T-Test

The T-Test is utilized to test the significance of the difference between Means, or to test the significance of the variation of a value when it deviates from a previously determined Mean. Three hypotheses may be selected for testing. They are;

>   a. Hypothesis is that the Mean is equal to a specific value.

b. Hypothesis is that Mean 1 is equal to Mean 2, given that Standard Deviation 1 is equal to Standard Deviation 2.

c. Hypothesis is that Mean 1 is equal to Mean 2, given that Standard Deviation 1 is not equal to Standard Deviation 2.

To test these hypotheses, follow this procedure:

a. Select [6] T-Test, from the Master Menu.

b. From that point on, follow the screen prompts to enter the data and get the T values.

c. Enter a table of significance for T-Test to be found in any standard Statistics handbook. Determine the statistical significance of the derived T value.

d. Use the exit routines to determine the next steps you wish to follow.

For directions for editing, printing, and disk access, see the section entitled USER OPTIONS.

III. USER OPTIONS

Editing Data

There will be times when you will wish to make changes in the data entered from a program. Each of the programs has provided an editing routine to allow you to do this. The editing routine may be accessed either from within the program, or during the use of the program's exit routine.

To enter the editing routine from within the program,
simply press [ESC]. This action causes a jump to the
routine. The "Enter More Data" option initiates the
same routine from the exit mode.

When the editing display is shown, you will note that
all raw data is displayed with the order of entry
shown in the left hand column. When multi-variable
data is concurrently entered (as in Pearson r) the
variable name is shown at the top of the column of
values. Select the order number of the value you wish
to change, enter it, press [RETURN], then make the
change in the value entry.

To exit the editing routine, press [0] (Zero Key),
then press [RETURN]. This will return you to either
the main program or the exit routine, depending where
the editing routine was initiated from.

Disk Storage

Each of the programs has been configured so that you
may both save and retrieve data to/from your
diskette.

The initial question on each program asks whether you
wish Keyboard or Disk as the data source. If you wish
to retrieve data from a pre-existing file, enter a [1]
Disk as your response to this question. You are then
asked for the file number corresponding to the data
file to be accessed. Enter that number, causing the
file number to load from the diskette. At that point
the program will continue to execute in all respects
as though you had made a keyboard entry to it.

To save a file to diskette, proceed through the
program, entering the data, and getting the results.
Press the [SPACE BAR] to get to the exit routine.
Then select [4] Save Data to Disk. Enter a three digit
number as the file name and press [RETURN]. This will

save a data file, which is retrievable through that
file number. After saving the file, you are returned
to the exit menu for your next choice.

Printing Out Data

A most useful feature of the STATISTICS 3.0 system is
the accessibility to hard-copy printing routines.   To
access this feature, do the following:

After completing any program and moving to the exit
routine, select the "Output to Printer" option. Make
certain your printer is loaded with paper and the
power is turned on, before proceeding further. When
this is done, enter the slot number in which the
printer is installed, and press [RETURN]. A printout
of all the data and the resulting statistics will
immediately occur. At the conclusion of the printout,
you will be returned to the exit menu.

IV. ERROR HANDLING

However advanced this computer technology may look, we
are still in the dark ages when it comes to
reliability of programs and the magnetic media on
which they are stored.

For whatever small comfort it may bring, we have
installed some error reporting systems that will at
least tell you what has gone wrong and what, if
anything, you can do to fix the problem.

If the problem is with your diskette, read the screen
display and follow any directions it gives you,
including returning it to us.

We also invite you to call us about any difficulties
you may experience or any innovative application you
make of these programs. Our number is (213) 346-6783.
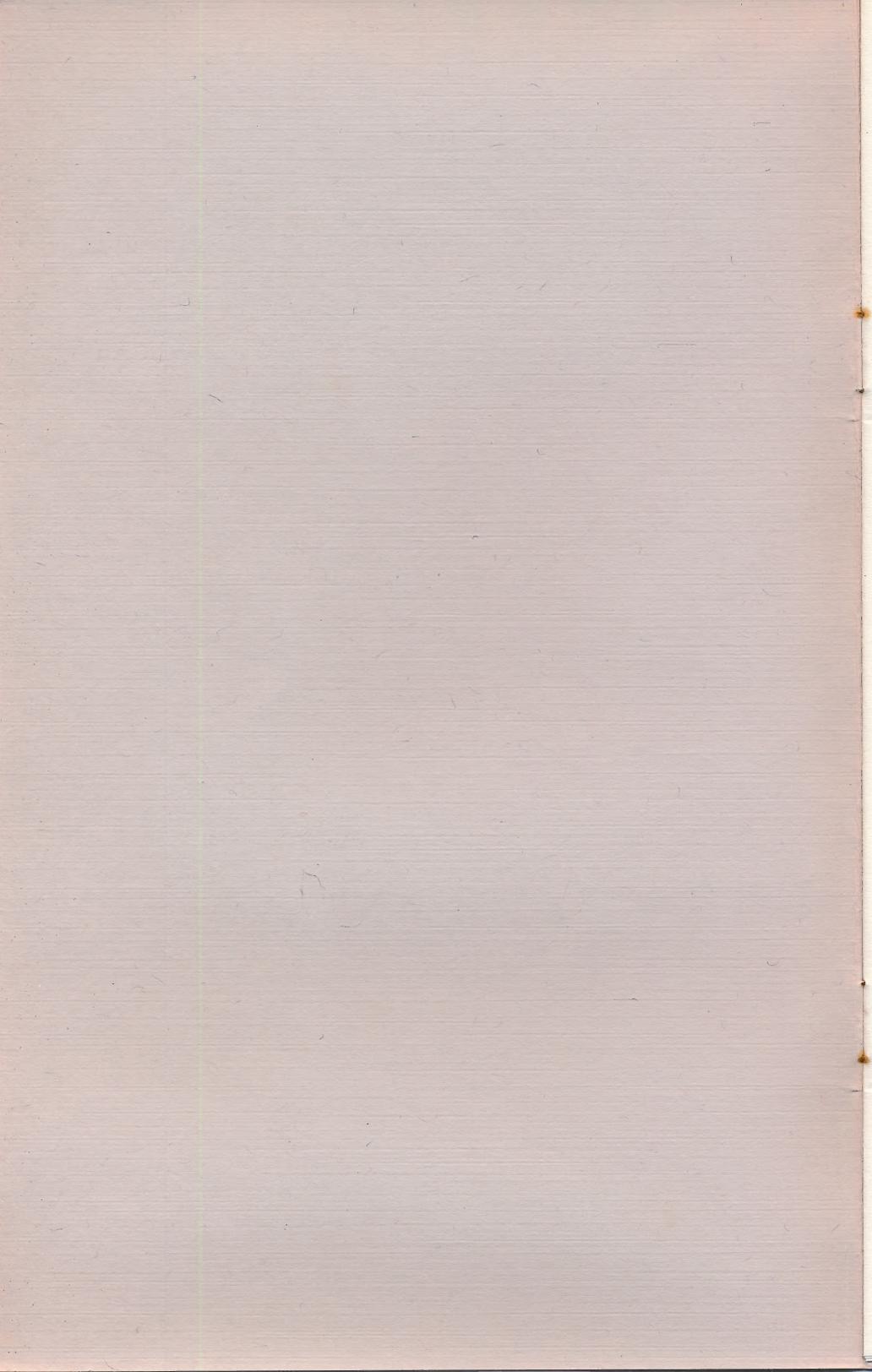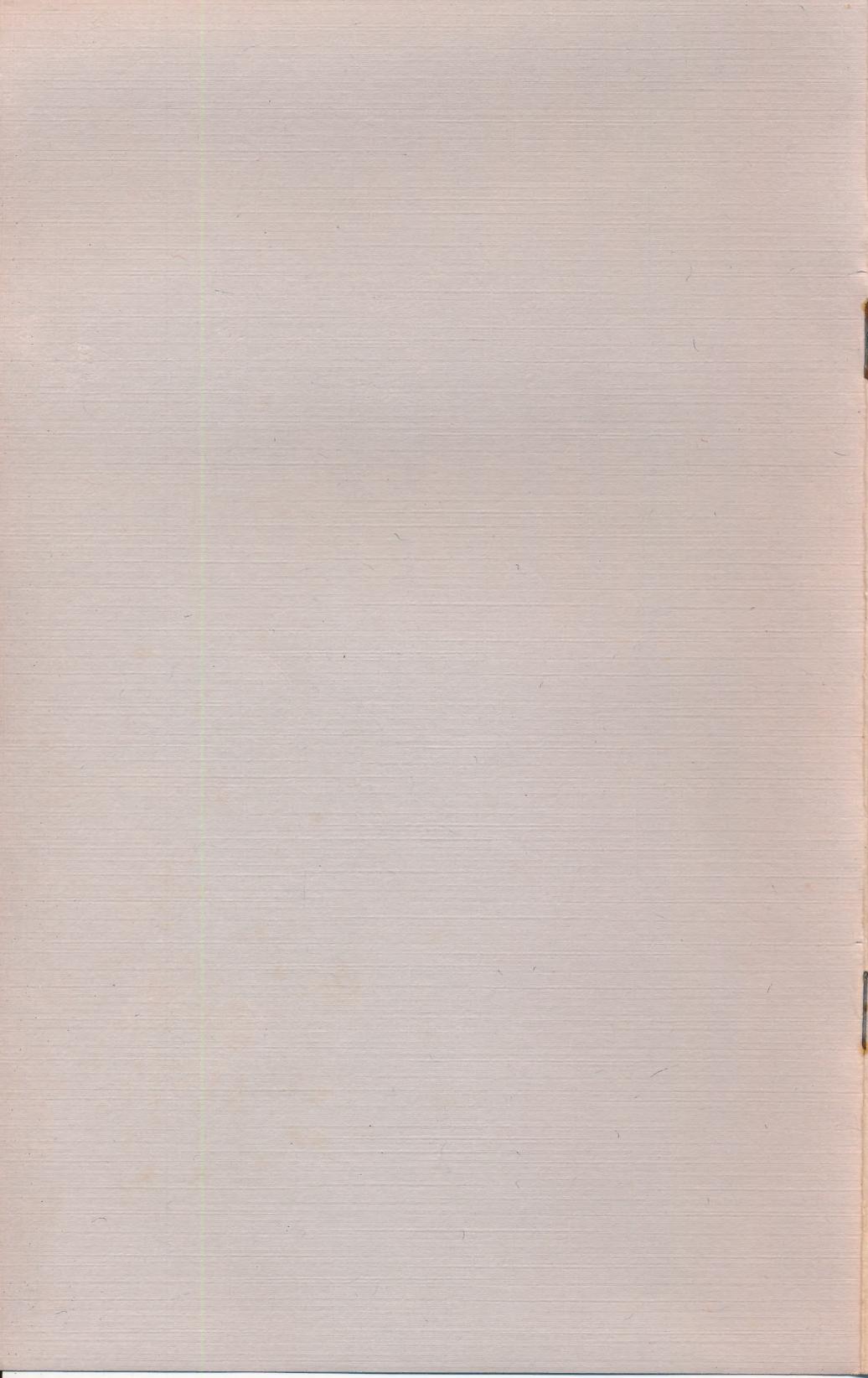
Now that you have purchased your EDU-WARE, you may wish to receive a catalog and information about updates and new releases. If so, fill out this card and drop it in the mail. (The information which you supply will help us in our market research.)

PRODUCT NAME   VERSION # (displayed when you boot your disk)

YOUR NAME

STREET ADDRESS

CITY   STATE   ZIP

PHONE #

How did you hear about this product? _____

Are you the end-user?   Yes ☐   No ☐

Your Age?   -17 ☐   18-25 ☐   26-35 ☐   36-45 ☐   46-55 ☐   55- ☐

Comments? _____

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