BestGues 1.05

Task Time Estimating Made Easy

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1.0 Introduction

BestGues is a task planning tool intended to complement the increasingly popular scheduling programs which have proliferated in recent years. BestGues is based on the PERT time estimating technique (as opposed to the PERT task charting technique found in many planning packages), helping you to conveniently estimate how much time to assign to each scheduled event. PERT time estimating using BestGues is a statistically based approach. You break each major schedule item into subtasks (up to 15) and assign a minimum, typical and maximum time estimate for each. On your command, BestGues then calculates probability data for your entries. This data helps you to estimate the task duration to with a statistically determined confidence of success.

BestGues has been designed specifically to make the PERT estimating process easy to use. The menu prompts virtually eliminate the need for a manual or chart of commands. The line editor commands for data entry are very similar to the keystrokes for most popular word processors.

2.0 Installation

2.1 System Requirements

BestGues will work with any IBM PC/XT/AT/PS2 system or compatible with either a monochrome or color graphics adapter of any flavor. The display card and monitor must have graphics capability. The IBM monochrome display adapter is not supported. Memory requirements are minimal. The program will run easily in 128K of memory including DOS (most systems have 640K these days). PC-DOS or MS-DOS 2.0 or above is required.

BestGues was designed to operate with any serial or parallel printer. Only standard ASCII codes are output to the printer. No special print codes are used. The program has been tested on Epson FX-80 compatible printers, the HP DeskJet, and the Epson LQ series of printers with no problems. If you use a serial printer, the DOS list device (PRN) needs to be assigned to the COM port to which your printer is connected using the command:

```
MODE LPT1 = COMn

          where n is the port # (1,2, or 3).
```

This could be included in a batch file which loads BestGues. The command would then be reversed on exit with

```
MODE LPT1.
```

A sample batch file is included on the disk, BGSER.BAT, to help you set your serial port prior to loading BestGues.

2.2 Making Working Copies

If you have a hard disk, set up a subdirectory for BestGues and copy the files from the distribution disk to the directory.

If you have a floppy disk system, copy all of the files on the BestGues disk to a formatted working disk.

2.3 Starting BestGues

On hard disk drives, change the default directory to the one containing BestGues and type 'BestGues' <Enter>.

On a floppy disk system, insert the BestGues working disk in the default drive and type 'BestGues' <Enter>.

The first time you start BestGues, the program will ask you to identify whether you have a monochrome or color monitor. Select the appropriate item and BestGues will begin. If you need to change monitor types, erase the file BestGues.opt on your floppy or hard disk and start BestGues to re-select monitor type.

3.0 Using BestGues

3.1 The Screen

At this point the best way to learn about BestGues is to get the program up and running. So start BestGues on your computer system before continuing.

If you're starting BestGues for the first time, select the appropriate monitor at the prompt. BestGues will then create an options file (BestGues.opt) on the default path which will contain the basic options data. This file is loaded every time BestGues is started. The data in the file can be modified using the Options command on the BestGues main menu. BestGues will now create the main screen display and wait for your menu selection.

3.1.1 File Names

The BestGues screen (going from top to bottom), displays the version number and copyright notice at the top of the screen. The next line is the current file name. This name is updated whenever you save a file or load a file. BestGues files have the extension '.dat' automatically appended to

them when the files are saved. BestGues will only load files with the '.dat' extension. When entering a file name, the '.dat' extension need not be entered.

3.1.2 Task Names

Following the file name is the Task Name field. The Task Name is the name you enter to describe the major task that is being estimated using BestGues. If you were using BestGues with a project scheduler, the Task Name would correspond to one of the task items on the schedule. Otherwise, you could use this field to describe the overall task being estimated in any way you like. The Task Name field is 30 characters long. Data is entered via the Edit menu (select the F1 function key).

3.1.3 Units

To the right of the Task Name field is the Time Estimate title followed by the current units. When you first start BestGues, the units option is set to 'Hrs'. Using the Options command (select F5), any units you would care to use (nanoseconds, fortnights, leapseconds, etc.) can be entered either for the current session or as the standard unit on startup. The unit is entered as a 1 to 5 character abbreviation that you create (ex. 'fts' for fortnights, 'lpsec' for leapseconds, '@!#' when your upset with your supervisor, or whatever). The units display is merely a label and has nothing to do with the way in which data is interpreted or calculated. In BestGues 1.05 the units value is saved when a file is saved.

3.1.4 Subtask Descriptions

BestGues is designed to accept up to 15 subtask items. This allows sufficient space for a satisfactory breakdown of a given task. If you find that you need more space, it probably means that you need to break the larger task down to one or more smaller tasks. The Subtask Description fields allow you to describe the subtasks with up to 34 characters per task. You may choose to use a given Subtask Description field to enter a title under which other subtask elements are listed. In that case, the title item will not have Time Estimate values assigned to it. This is perfectly acceptable and will not produce any errors in the calculation.

Data is entered in Subtask Description fields via the Edit command and the edit menu system. The line editor uses commands similar to a number of popular word processors (see Appendix A for the line editor commands).

3.1.5 Time Estimate Fields

The Time Estimate fields contain the numeric data you enter to describe how long a task will take. The Minimum column should be used to estimate the most optimistic estimate of task duration. The Typical column contains an estimate that represents a most probable estimate of the time the task will take. The Maximum column is a worst case estimate of the task duration. Time estimates in any column may have a value between 0.0 and 999.9 units inclusive. The Typical time must be greater than or equal to the Minimum time and the Maximum time must be greater than or equal to the Typical time. BestGues checks the numeric data entries for compliance with these rules when you exit from the Edit menu. The item numbers of offending entries are highlighted to indicate which item entries are in error. You may save or load files that are in error. You cannot calculate or print erroneous data.

3.1.6 Result Window

When the F3 function key is pressed, BestGues calculates the overall probability distribution for the data entered and displays the result. Try pressing F3 and see the result.

The Prob(%) line displays the confidence interval calculated (10%, 25%, 50%, 75%, and 90%) for available data. Since no data has been loaded, the Time line displays all zeros. In PERT time analysis, the sum of the maximum times is considered the worst possible scenario and assigned a confidence of 100%. The mean of the normal distribution is then a 50% confidence point and using the standard deviation is used to calculate the remaining confidence intervals.

The basic philosophy of the statistical approach is that while worst case estimates will seldom (never say 'never') be exceeded, they are often too conservative in practice. The distribution allows you to assess the risk associated with a less than worst case estimate. A 10% confidence estimate is probably very risky (i.e. it is unlikely that the task will be completed in the estimated time. A 50% confidence estimate will has a reasonable chance of being accurate and so on. There is no cosmic linkage to these estimates. The universe will not turn on these percentages. On the other hand, using the PERT time estimating approach BestGues gives you and those to whom you report an opportunity to evaluate the schedule or cost risk of a particular task in a quantified way.

The mean and standard deviation of the probability distribution are given to allow you to calculate other percentages from a table or graph of the normal probability distribution function. The standard deviation also gives you

a clue to the spread of distribution function. Standard deviations which are a small fraction (less than 5%) of the mean indicate tasks that are relatively low risk, since the spread of time estimates is small (the worst case scenario is less than 15% longer than the mean). Standard deviations that are large (greater than 20%) indicate a lot of uncertainty in the estimate (the worst case scenario is more than 60% longer than the mean). In conventional usage, the worst case corresponds to the mean plus 3 times the standard deviation.

3.1.7 The Main Menu

BestGues uses a simple function key based menu system. The highlighted menu line displays the current menu options. The main menu is the one displayed when BestGues is started. The main menu consists of the following command selections.

F1-Edit

By selecting F1 you get into the edit mode (try it!) which displays a new menu line and a highlighted item cell indicating which data cell can be edited. The arrow, backspace and return keys can be used to move to adjacent cells. When you wish to enter data in a cell, press any letter or number key or the space, '/', or '+' keys. If a subtask description cell is empty, the letter or number you press will be the first letter entered. If a time estimate cell has a value of '0.0', and you press a number key, the number you press will become the first number entry. When editing is complete, hitting the enter key stores the modified data, while hitting the ESC key restores the data item to the previous value.

The F1 key in the edit mode allows you to edit the task name. The F2 key allows you to insert a new blank subtask item at the row where the highlighted cell is displayed. The F3 key allows you to delete the subtask item where the highlighted cell is displayed.

Try entering some practice data to get a feel for the editing process. You'll notice that when you enter a subtask description and press the enter key to save it, the program advances the highlight to the next subtask description cell. BestGues assumes that you will want to enter all the subtask descriptions first, before assigning time estimates. This auto-advance feature may be disabled within the option menu if you prefer.

If you move to a Time Estimate cell, enter data into the Minimum column and press enter, the cell highlight

automatically advances to the Typical column for the same row and places you in the data edit mode for that cell. If you enter data or simply press enter, BestGues advances to the Maximum column and again puts you in the edit mode for that cell. If you press enter from the Maximum column, BestGues advances to the Minimum cell of the next subtask item and again puts you in the edit mode for that cell. This auto-advance feature is also disabled by the same option command.

Play with the edit commands to get a feel for the operation of BestGues. After a short while, the editing process will seem intuitively obvious. Appendix A contains a list of the cell editing commands. These are especially helpful in editing subtask descriptions and for file name entry.

F2-Files

F2 selects the file menu where file save, file load and directory display options are available. File names are edited using the same set of commands as subtask descriptions (see Appendix A for complete descriptions of editing commands). BestGues assumes the currently active drive and pathname for a file unless you specify a different drive and/or path name in the file name you enter.

F3-Calc

F3 directs BestGues to calculate a new result based on the current Time Estimate data. If any Typical data cell is less than the corresponding Minimum data cell, or a Maximum data cell is less than the corresponding Typical cell, BestGues will display an error message in the Result window and indicate the offending item numbers by highlighting them.

F4-Print

F4 directs BestGues to print the displayed task. Print automatically causes the result to be recalculated to insure that the printed data is accurate. If Time Estimate data violates the rules for data entry (see F3-Calc above) an error message is displayed in the Result window and no data will be printed.

F5-Options

As befits any modern software program, BestGues offers you several options. You may change display colors, time units, file defaults, and cursor auto-advance in

the Edit mode. These changes can be saved for future sessions or installed for the current session only. The options selection and control process is easy to learn. Have a good time, especially with the display colors option on color monitors.

F6-New

This command allows you to erase the currently displayed data and start with a fresh, blank screen.

F7-Quit

The Quit command has been included to allow you to go to lunch, to go on business trips, to take vacations, to reintroduce yourself to your spouse, or to your lover or to your pet, or to finally get your car and clothes washed. It is perhaps the most useful command on the menu.

3.2 Examples

The BestGues disk contains the file 'sample.dat' which you can load and play with to get a further feel for the program and its commands. My wife, Nannette, (not a world class computer user) thinks that BestGues is very easy to use. Let me know what you think.

In addition, the following fictitious examples illustrate the ways BestGues might be used. Load BestGues and follow along with each example.

3.2.1 Estimating Labor Cost

Delila Samson operates a small business demolishing buildings. She needs to provide a schedule of events and an estimate for labor and materials for an upcoming job. Delila's initial schedule identifies the key tasks as illustrated in Figure 3.2.1-1. She uses BestGues to estimate how many hours each task will take. Load the BestGues example file 'samson.dat' for a look at how Delila estimated the demolition task. She broke the demolition task into the subtasks shown, entering all of the subtask descriptions first. Then for each subtask she entered her minimum, typical and maximum time estimates. Then she calculated the statistical result and printed out the result. Delila based her final labor estimate on the 75% probability figure to be conservative. These hours are the basis for her labor charges.

```
                          Weeks After Start of Job
Task Description      1         2         3         4

Obtain Permits
Obtain Explosives
Plan Demolition
Set Charges
Complete Demolition
```

Figure 3.2.1-: Delila Samson's First Draft of the Schedule.

To figure her schedule time, Delila knows that she has two other jobs in the same time frame, so she allows more time for each task than the labor needed to complete it to allow for delays and schedule conflicts. Her final schedule is shown in Figure 3.2.1-2.

```
                          Weeks After Start of Job
Task Description      1         2         3         4

Obtain Permits       |-------------->
Obtain Explosives    |--------->
Plan Demolition      |------------------------------>
Set Charges                                         |--->
Complete Demolition                                    X
```

Figure 3.2.1-3: Demolition Schedule Prepared by Fred Samson.

3.2.2 Estimating Lead Time

While time estimating is often concerned with controlling cost, we are frequency faced with estimating lead time as well, i.e. the amount of time to allow to get something done before a deadline. BestGues is a handy tool for this sort of estimating, as the following example will show.

Sam Friday is a member of the local Sanguinary Club and has

been given the pleasure of arranging for the annual January picnic in Coldton, Montana. He needs to get some idea of how long it will take to make all of the arrangements. Using BestGues, he lays out the key items, changes the time units to days, and estimates time for each task.

Load the file 'sang.dat' and review Sam's estimates. Sam based his estimates on the fact that he has a full time job as county assessor and so can't spend large blocks of time in any one day taking care of a task. Since Sam wants to be absolutely sure that he completes his task before the picnic, he uses the 90% probability estimate of 16 days as his lead time. He will start his preparations 16 days before the picnic.

3.2.3 Estimating Duration

BestGues can also be used to estimate the duration of a continuous task. By continuous, I mean that the task isn't interrupted by other priorities. A good example is the duration of a meeting.

Bob Apple is preparing the agenda for the next executive meeting of ROPE (Royal Order of Philanthropic Entrepreneurs) and is concerned that the meeting not run too long. Using BestGues he lists the agenda items and changes the units to minutes. He then assigns each agenda item time estimates (load the file 'rope.dat' and review Bob's results).

Reviewing the resulting distribution, Bob sees that the meeting could take as little as 229 minutes (3 hours and 49 minutes) or as much as 291 minutes (4 hours and 51 minutes). In order to conserve as much time as possible Bob decides to delete items 2 and 5 from the agenda. Delete items 2 and 5 from your copy of the agenda tasks. Then exit the edit mode and recalculate the result as Bob did.

Bob finds that the new agenda has a 50% probability of being done in 233 minutes (just under 4 hours) and a 90% probability of being done in 262 minutes (less than 4 hours and 30 minutes). Bob thinks this is good enough and finalizes his agenda without items 2 and 5.

3.3 BestGues as a Communication Tool

BestGues aids the estimating process in more ways than the simple listing of items and calculation of probabilities. In any team endeavor, communication is one of the key elements. BestGues printouts for a given task communicate not only the time estimate, but your view of the elements of the task. Team members can then work together to refine a common view of the scope of the task based on your initial inputs. The

result is fewer misunderstandings about what a particular estimate means.

BestGues printouts also serve as a record of your thinking on a particular project for future reference and a way of comparing your own performance against your estimate of your own performance. The resulting self-knowledge could help you improve future estimates and future performance.

Appendix A - Cell Editing Commands

Note: Keys preceded by the abbreviation 'ctrl' are to be entered by simultaneously pressing the 'ctrl' key and the key indicated.

Key Strokes	Result
enter	accept the data as entered
esc, ctrl break	quit without changing line
left arrow, ctrl s	cursor left one character
right arrow, ctrl d	cursor right one character
ctrl left arrow, ctrl a	cursor left one word
ctrl right arrow, ctrl F	cursor right one word
home, ctrl q, s	cursor to the beginning of the line (press 'ctrl q' and release and then press 's')
end, ctrl q, d	cursor to the end of the line (press 'ctrl q' and release and then press 'd')
del, ctrl g	delete the character at the cursor
bksp, ctrl h, ctrl bksp	delete the character to the left of the cursor
ctrl end, ctrl q, y	delete from the cursor position to the end of the line (press 'ctrl q' and release and then press 'y')
ctrl y, ctrl x	delete the entire line
ctrl home	delete from the beginning of the line to the cursor position
ctrl t	delete the word to the right of the cursor
ins	toggle the insert mode on and off - the fatter cursor indicates insert mode, the thin cursor indicates type-over mode

ctrl r, ctrl q, l	restores the original contents of the line (press 'ctrl q', release, and then press 'l')

Appendix B - A Dictionary of Popular Estimating Terminology

The following terms are often used in the give and take of estimating and scheduling. They are defined here to help clarify meaning and usage. The terms are listed in order of increasing confidence in the basis for the estimate, 'PDOOTA' indicating the least trustworthy data, and 'QUOTATION' the most trustworthy. It is noteworthy that the ranking used here also corresponds to decreasing frequency of use in actual estimating practice.

PDOOTA - 'Pulled Directly Out Of Thin Air', similar to the better known but less polite 'PDOOMA'. No basis of any sort is implied.

WAG - 'Wild Ass Guess'- the estimator locates and consults a wild ass for an opinion on the estimate and submits same.

SWAG - 'Scientific Wild Ass Guess' - the estimator locates and consults a wild ass with a PhD in the field in question for an opinion on the estimate and submits same.

ROM - 'Rough Order of Magnitude' - the estimator uses his/her experience to create an estimate believed to be between 10% and 10 times the actual amount of time or money that will be required to complete the task in question.

BUDGETARY - a budgetary estimate is an estimate large enough to be credible but small enough to be within the presently allotted amount of time or money. While generally more accurate than any of the above estimating methods, budgetary estimates usually fall short of actual cost or time spent by 50-100%.

QUOTATION - A true quotation is a rare find indeed. While estimates called 'quotations' are submitted by estimators regularly, the actual data used more often than not falls in one of the previously mentioned categories. A true quotation is usually no more than 20% below actual cost if you're the supplier, or 20% above a fair price if you're the customer.