

Benzer Line-Moving Program

(accessory to tour of Benzer (1959) Proc Natl Acad Sci 45:1607-1620)

Seymour Benzer claimed that the process of moving lines of Fig. 4 to reach dictionary order “can be readily accomplished.” Hah! I’d like to watch him do it with pencil and paper! Fortunately, you don’t need to resort to pencil and paper yourself. The accompanying program facilitates the process by moving lines around instantaneously, at your command.

You begin with a representation of Benzer’s Fig. 4, shown in the screen shot to the right. From there you have four possible actions, which you choose by typing into the command line. Note that it doesn’t matter whether you use upper or lower case. Press the enter key after typing the command.

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                                Recombination Matrix
184 0 0 1 0 1 0 1 1 1 1 0 1 1 1 1 1 1 0 0 0
215 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0
221 1 1 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0
250 0 1 1 0 1 0 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0
347 1 1 0 1 0 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0
455 0 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0
459 1 1 0 1 1 1 0 0 1 0 0 0 0 1 1 1 0 1 1 0 0
506 1 1 0 1 1 1 1 0 1 1 0 1 1 1 1 1 1 1 1 1 0
749 1 1 0 1 1 1 0 1 0 0 0 0 1 1 1 1 0 1 1 1 0
761 1 1 0 1 1 1 0 1 0 0 0 0 1 1 1 1 0 1 1 1 0
782 0 1 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0
852 1 1 0 1 1 1 0 1 0 0 0 0 1 1 1 0 1 1 1 1 0
882 1 1 0 1 1 1 1 1 1 1 1 0 1 0 1 0 1 1 1 1 0
A103 1 1 0 1 1 1 1 1 1 1 1 0 1 1 0 0 1 1 1 1 0
B139 1 1 0 1 1 1 1 1 1 1 1 0 1 1 0 0 1 1 1 1 0
C4 1 1 0 1 1 1 0 1 0 0 0 0 0 1 1 0 0 1 1 1 0
C33 0 1 0 0 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 0
C51 0 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0
H23 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Command:
Syntax: S<wap> mut1 mut2 ■ M<ove> mut1 [BEFORE/AFTER] mut2 ■ R<estart> ■ Q<uit>

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Here are the meanings and examples for each command:

Move a line from one place to another. Examples:

M C4 before 221 (*recalculates the table with C4 as the 3rd line*)

m C4 AFTER 221 (*recalculates the table with C4 as the 4th line*)

Swap two lines. Example:

S 184 215 (*places mutant 215 at the top and mutant 184 in the 2nd position*)

Restart. This brings you back to the original order of Fig. 4. Example:

R

Quit. This exits the program. Example:

Q

NOTE! This program will work only on PC’s running Windows or MS-DOS. It will not work within Unix or Linux. It will not run on a Mac.