

A convenient method of generating Fibonacci numbers is the alternating sub-total exchange and add procedure which is easily performed on the Olivetti Tetractys desk calculator.

The Olivetti Tetractys has two separate accumulating registers so arranged that the contents of either can be added to the other by manual commands and without re-writing numbers into the input keyboard. The detailed procedure for generating any Fibonacci sequence on the Tetractys follows:

Set automatic total lever (14) to left and set automatic accumulation lever (29) to up position.

- a) Clear the registers by depressing the green and black total keys.
- b) Write the value of the initial term of the sequence in the 10-key keyboard.
- c) Depress the green add key. The initial value now printed on the tape in blue ink is the sequence title but is not the first term.
- d) Advance the paper tape 3 lines.
- e) Depress simultaneously the green sub-total key and the black add key. The initial term of the sequence is now printed on the tape in red ink.
- f) Depress simultaneously the black sub-total key and the green add key. The second term of the sequence is now printed on the tape in red ink.
- g) Repeat step (e) for the third term.
- h) Repeat step (f) for the fourth term.
- i) Continue alternating steps (e) and (f) for as many terms as desired up to the 13 decimal digit capacity of the arithmetic registers.
- j) The sequence can be continued beyond the 13 digit limit by clearing the registers, step (a), and rewriting the required most significant digits of the last term obtained as a new initial value, restarting at step (b).

It takes a little practice to develop the manual knack of simultaneously depressing the adjacent sub-total and add keys. A firm push is necessary but it must not last too long or the operation will be done twice, producing an error.

In generating long sequences it is a read-out convenience to depress the non-add key after every fifth term. This provides a blank line and makes it easy to count terms.

It is difficult, but not impossible to make errors. The usual errors consist in skipping a step or doing a step twice, which amount to the same thing.

The printed tape can be checked for errors in two ways.

- 1) Each term approximates 1.6 times the preceding term.
- 2) The + symbols on the far right side of the printed tape should alternate between the two symbol columns. If two successive + signs fall in the same vertical symbol column, an error was made at that point.

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