Samples for Problem Set 8

Input sample 1. (From *A Capsule History of Typesetting*, by Brown, R.J.)

The first practical mechanized type casting machine was invented in 1884 by Ottmar Mergenthaler. His invention was called the ”Linotype”. It produced solid lines of text cast from rows of matrices. Each matrice was a block of metal – usually brass – into which an impression of a letter had been engraved or stamped. The line-composing operation was done by means of a keyboard similar to a typewriter. A later development in line composition was the ”Teletypewriter”. It was invented in 1913. This machine could be attached directly to a Linotype or similar machines to control composition by means of a perforated tape. The tape was punched on a separate keyboard unit. A tape-reader translated the punched code into electrical signals that could be sent by wire to tape-punching units in many cities simultaneously. The first major news event to make use of the Teletypewriter was World War I.

Input Sample 2. (From *an 1882 issue of the London Graphic.*)

The process of electrotyping may be briefly described as follows: The wood block or color plate is placed in a bed of wax, which has been melted, and allowed to cool until it has arrived at the proper consistency. It is then submitted to a great pressure in a press of hydraulic or other construction. In this way a facsimile of the original is produced but with every detail reversed. This was impression is then covered with a thin coating of black lead, such being a good conductor of electricity, and is hung by means of a brass rod in a large bath filled with a solution of sulfate of copper and sulfuric acid. Side by side with this bath is a powerful battery of Smee’s construction, that is to say zinc, and platinized silver in dilute sulfuric acid. The current generated by this battery is put into connection with the wax mold hung in the bath, and also with a sheet of copper also hung side by side with the mold. The effect of the electricity is in the first place to decompose the copper and in the second place to attract the particles of copper to the mold. In a short time a thin coating of copper has formed along the mold, of which it is again the reverse, and consequently the exact facsimile of the original block. The shell, as it is called, is then filled up at the back with metal in order to make the surface perfectly hard and suitable for printing. After being made smooth and uniform in thickness by means of lathes and planing machines, it is mounted upon wood and is ready for the machine.

Input Sample 3. (Of *unknown* origin.)

The International Typographical Union, was described as, ”the oldest union in America, and organized to prevent the use of labor saving improvements.” The union fought hard for its members and when times were hard would send money and train fare to unemployed Typesetters, and direct them to places where prospects were better. When preset advertising copy began to be provided by advertisers, in the late nineteenth century, the union required that this type could be used as

received only if a union Typesetter was employed to reset, print, proof, and throw away the same copy. The union leader who negotiated this requirement is reported to have been a Mr. Bogus, and this redundant make-work typesetting was called ”bogus” type and added a word to the language. (There are other explanations for the word, but none contradicts this one). Even as late as the 1980s, most type was set on lead casting machines, and the production manager at the San Jose News complained that his reporters’ stories were being retyped by ”400-dollar a month secretaries who type 80 words a minute and don’t make mistakes, and then retyped at 40 words a minute on Linotype machines by 800-dollar a month Typesetters who do make mistakes.”

Input sample 4. (From *Out of Their Minds*, by Shasha, Lazere. Springer-Verlag, New York, 1995, page 99.)

Throughout his life, Knuth had been intrigued by the mechanics of printing and graphics. As a boy at Wisconsin summer camp in the 1940s, he wrote a guide to plants and illustrated the flowers with a stylus on the blue ditto paper that was commonly used in printing at that time. In college, he recalls admiring the typeface used in his math texbooks. But he was content to leave the mechanics of designing and setting type to the experts. ”I never thought I would have any control over printing. Printing was done by typographers, hot lead, scary stuff. Then in 1977, I learned about new printing machines that print characters made out of zeros and ones, just bits, no lead. Suddenly, printing was a computer science problem. I couldn’t resist the challenge of developing computer tools using the new technology with which to write my next books.” Knuth designed and implemented TeX, a computer language for digital typography. He explored the field of typography with characteristic thoroughness. For example, he wrote a paper called ”The letter S” in which he dissects the mathematical shape of that letter through the ages, and explains his several day effort to find the equation that yields the most pleasing outline.

Here is what Sample 1 should look like when typeset with $M = 50$. Feel free to use this output to debug your code.

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Total cost=5304
[43]    The first practical mechanized type casting
[38]    machine was invented in 1884 by Ottmar
[42]    Mergenthaler. His invention was called the
[43]    "Linotype". It produced solid lines of text
[46]    cast from rows of matrices. Each matrice was a
[45]    block of metal -- usually brass -- into which
[46]    an impression of a letter had been engraved or
[46]    stamped. The line-composing operation was done
[47]    by means of a keyboard similar to a typewriter.
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[43]    A later development in line composition was
[46]    the "Teletypewriter". It was invented in 1913.
[42]    This machine could be attached directly to
[41]    a Linotype or similar machines to control
[46]    composition by means of a perforated tape. The
[45]    tape was punched on a separate keyboard unit.
[46]    A tape-reader translated the punched code into
[48]    electrical signals that could be sent by wire to
[50]    tape-punching units in many cities simultaneously.
[45]    The first major news event to make use of the
[31]    Teletypewriter was World War I.
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