I. P. Sharp
newsletter

in this issue
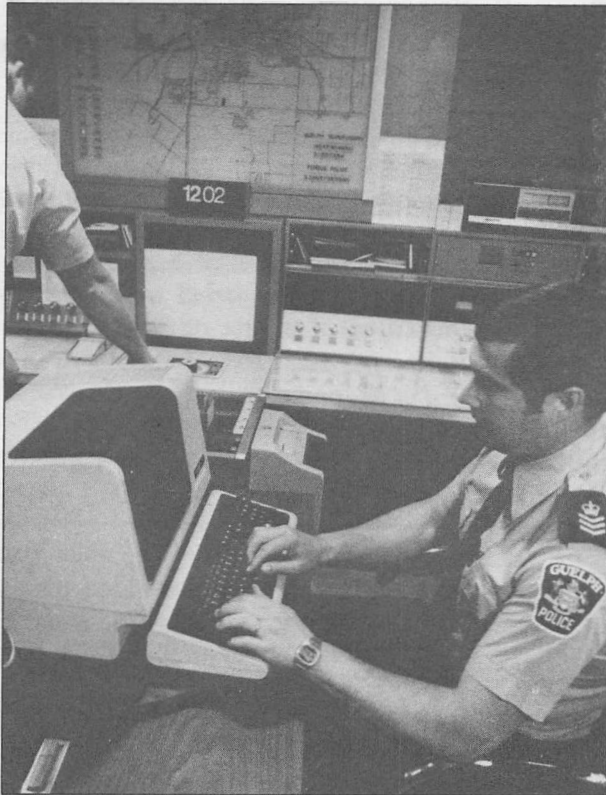
Police Get a Computerized Crime-Fighter

Four Canadian police forces are linked by computers, using software designed by the Special Systems Division of I. P. Sharp Associates. The Police Regionalized Information and Data Entry (PRIDE) central computer system provides complete information retrieval capabilities for the police forces in the southern Ontario cities of Kitchener-Waterloo, Guelph, Stratford, and Brantford. PRIDE holds their daily operational and management records, providing more efficient information-sharing among the participating forces.

The installation at the Waterloo Regional Police Force consists of a Digital Equipment Corporation VAX 11/780 computer system which supports about 60 remote terminals. However, the computer programs developed for the system run on a range of VAX computers. I. P. Sharp Associates will be moving its own software to a VAX 11/750 and 730 in the near future. The number of terminals linked to PRIDE can vary. At the Guelph police station, there are 11 terminals connected to the system, Brantford has 7, Stratford 6, and Waterloo 35.

Harold Basse, chief of the Waterloo Regional Police Force, says, "This is a significant event in the changing face of policing in one particular area. It certainly is the most modern computer system in Canada, and, perhaps, in North America."

Most police forces across Canada keep paper records. Under the old manual system, the Waterloo Regional Police Communications and Records Division maintained a name index file typed on cards. Updating and filing were relatively effective, but retrieving the cards was a slow process. Using terminals, they now have many ways to access the information.

special systems

... A Computerized Crime-Fighter

"There are questions we couldn't even ask under the old system," adds Staff Sergeant Herb Breese of the Guelph Police Force, "that we can get answers to in seconds now. For instance, with just a first name, a person's height and hair colour, the computer can be searched for names of people meeting the description. With just a colour and make of a car, a search can find the licence number and owner."

Fast retrieval of information

This same fast search is possible in all four police forces since they share a massive data bank with its own backup system. Staff Sergeant Larry Gravill, Waterloo Regional Police Computer Services, explains, "There are two complete systems in case of hardware failure.

Since the system runs 24 hours a day at all times, we have a total duplication of our information so we can switch over to our backup system if necessary.

"PRIDE is linked with a national data base in Ottawa, the Canadian Police Information Centre (CPIC), which in turn connects with other international agencies such as INTERPOL and other Canadian forces. For example, we can access Vancouver records from Waterloo."

The transfer of information can take as little as seven seconds. One Communications and Records Division clerk in Waterloo says that at least two crimes she knew of had been solved when a search was carried out with the minimal information of a first name and general description.

Adds Staff Sergeant Gravill, "There's no such thing anymore as a local criminal. The information process is reaching a much wider

Special Systems Division: Public Safety Group

The Special Systems Division of I. P. Sharp Associates has 20 years of experience in specifying and implementing on-site computer systems in a variety of applications. These include defence, air traffic control, nuclear reactor control, police information, stock exchange and brokerage, microfilm retrieval, data communications, and process management information systems.

The Special Systems Division comprises two groups: the PROMIS group, which develops computerized systems for semiconductor manufacturing facilities, and the more recently formed Public Safety Group, which focuses on the production and licensing of software packages for emergency service organizations.

Among the systems developed by the Public Safety Group, the most significant are:

- Police Automated Registration Information System (PARIS) was originally developed for the Ontario Police Commission. Similar systems were later installed in British Columbia and Alberta, Canada.
- Police Regionalized Information and Data Entry (PRIDE) was developed for the Regional Police Force of Waterloo, and the cities of Brantford, Stratford, and Guelph. (See the preceding article.) Phase 2 of this

system deals with the computer aided dispatch of police officers and vehicles; and Phase 3, the installation of mobile data terminals in police vehicles.
- Computer Aided System for Police Enforcement and Records (CASPER) is currently under development for the Peel Regional Police Force. Similar to PRIDE, CASPER will also incorporate computer aided dispatch and mobile data terminals, with an extensive records-keeping system and a complete Canadian Police Information Centre (CPIC) interface.
- Toronto Fire Department Computer Aided Dispatch system, presently under development, will be used for address verification and personnel/apparatus dispatching.

For more information on these or other applications, contact Mary Lane, Product Manager:

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Telephone: 416 364–5361

...A Computerized Crime-Fighter

base. We can access information on criminal records from the other three cities and they can access ours.

"We have expanded from four terminals for the entire region in the Waterloo Regional Police Communications and Records Division, so officers can access terminals in their branch and formulate their own queries. Officers are still using radio channels in cruisers and retrieving information from the office when on patrol. But once they are in the divisional office to write reports, have lunch, or do follow-up investigation, they don't have to go through operators in the Communications and Records Division. They have their own terminals, which speeds up the search time. They also have the flexibility to do a number of queries which they might have been hesitant to do when there are only three to four operators in Communications and Records handling up to 100 officers at a time."

Not only does PRIDE aid the officer on the beat, but after all their paperwork is done, the police forces compile statistics by computer and store them on the system.

Now that the records system is in place with rapid exchange of information and retrieval of data, the next step is a computer aided dispatch system. By late August of this year, the final design for the system will be complete. Dispatchers will be able to get immediate information on a call, verify the address, and assign patrol units to service the call.

Staff Sergeants Gravill and Breese agree that a natural extension of computer aided dispatch is mobile terminals in cruisers, which they feel may be installed late 1985 or 1986. It's possible for the programs to be ready much sooner, but funding is far off. There are only a few major cities in North America that have computer terminals in police cars.

With state-of-the-art technology available to them, you can look to these four police forces to continue to be innovative when it comes to crime-fighting. ■

Novo: A World Force in Bioengineering

Novo Industri A/S of Denmark is the world's top producer of enzymes for industrial use, and a leading world provider of insulin. Ninety-eight per cent of its products are sold outside Europe.

This impressive corporate story began in 1925 when two brothers, Harald and Thorvald Pedersen, started manufacturing insulin in a basement. Since then, the company has accomplished much. In 1947, it was one of the first in the world to produce crystalline penicillin; four years later it launched into the manufacture of heparin, which is used to prevent blood-clotting; and the following year it branched out into the production of enzymes by fermentation.

Novo now markets its products in 120 countries and has extensive research and development facilities in Denmark, Switzerland, France, South Africa, Japan, and the United States. There are subsidiaries or information offices in 25 countries on all continents.

With a worldwide operation, Novo's executives make hefty demands on the company's information systems—for administrative and organizational purposes as well as for the calculation of statistical and analytical operations.

To meet the needs of management, three main computer facilities are available today: a centralized data processing facility based on two ICL 2955 mainframe computers, providing batch and online data processing; a distributed network via Datapoint minicomputers in Copenhagen and in Novo's subsidiaries; and an IBM 3083 system which runs the SHARP APL information services along with other services.

Keeping pace with the company, the development of SHARP APL information services has been rapid at Novo, and coincided with the arrival of the company's data processing manager, Per Klitgaard Andersen, in 1976.

SHARP APL presented a new-found opportunity for self-service data processing. In the early 1970's, before APL was available at Novo, the company's data processing services had been confined to a conventional centralized batch facility. This facility could provide the management information widely sought by the organization's commercial and technical executives.

...Novo: A World Force in Bioengineering

The introduction of the I. P. Sharp Online Service for administrative and scientific management was by no means cosmetic. The cost of the new service was rigorously controlled, and by the end of 1978, it had proved itself as an essential and integral facility. All this time, the applications for SHARP APL were multiplying.

Installing a SHARP APL/370 system

By the end of 1979, further expansion was necessary to meet user demands. Discussions began regarding the installation of SHARP APL on an in-house computer. In May 1982, an IBM 4341 computer was delivered, and the system was up and running within a week.

So what exactly does Novo need from its SHARP APL system? There are now between 90 and 100 regular APL users—primarily managers of sales and production from the corporate staff. Some of these executives use the facility for complex scientific work, while others have found that it lends itself admirably to production inventory and quality control. A complete personnel registration system also runs on Novo's SHARP APL services.

In addition, Novo's installation of SHARP APL/370 has made APL information and programming facilities available to international users. Andersen takes up the story: "The latest facility we have developed is an economic consolidation tool. We have adapted the Datapoint hardware in our subsidiaries so that it acts like an APL terminal, and this will extend the scope of the system. We also have regular APL terminals in our subsidiaries."

Today, Novo's IBM 3083 is hooked up to the I. P. Sharp Network (IPSANET) via the I. P. Sharp Copenhagen office. The link between the two involves a special communication line made possible by the Danish telecommunications authority, which has been "very cooperative in making all this happen" according to Andersen. The Danish telecommunications authority will also be closely involved in Novo's future plans to make the most of the international PSS network in the United Kingdom.

Meanwhile, the IBM 3083 configuration is continually being enhanced, although the systems development team comprises just six staff. The computer centre operates 24 hours a day, seven days a week. The system is accessed by terminals that have been systematically developed from standard teletypes and by video terminals, and there are plotters for colour graphics which are additional management tools.

Despite Novo's evident enthusiasm for their SHARP APL system, access is selective and controlled. "We have different sorts of keys exclusive to specific administrative users," Andersen says. "We do not have APL freaks using our system...of our 100 users, only 10 or 20 are doing program development work themselves."

Training is also highly organized. Several internal courses are run with approximately 10 participants at each. Andersen expects that only two from each course will show active interest in using the APL language and systems service in the short term. In the long term, he has seen evidence that the training may be used at a later date. He pointed out that many trainees are busy sales representatives who learn about APL and would return to use it as a management tool, as and when they needed it.

Distributed SHARP APL/370 systems

Novo has now joined an exclusive and expanding group of companies that started out using the I. P. Sharp Online Service, and ended up installing their own SHARP APL mainframe configurations.

I. P. Sharp installed its first distributed SHARP APL system in 1978. Now there are 42 installations in the world, and half of these sites have chosen to link with IPSANET. As SHARP APL is updated, Novo and other distributed sites automatically receive the new software releases.

The best information processing systems are as natural an adjunct to a company as an arm or a leg is to the human frame. Unfortunately, the politics of computing still produce information systems that fail to be relevant to their users, for many data processing managers still prefer to believe that centralized computer facilities are the only way to go. Fortunately for Novo Industri, Per Klitgaard Andersen realized that such a narrow vision could only be damaging to the growth and development of the company. Novo evidently enjoys the freedom to exercise self-service computing in the true sense. ∎

Newsday Tracks the News with Online Data

"*Newsday* prides itself on covering Long Island news and the index gives us another handle on the business news," says Alan Wax, business reporter and assistant editor to the Business Desk.

The index Wax is referring to is the Long Island Stock Index which made its debut in *Newsday*'s Business Section on 27 June 1983. The Long Island Stock Index is a weighted index of publicly traded companies that meet certain generally accepted criteria. I. P. Sharp Associates created the index for *Newsday* and, for comparison, adjusted the New York Stock Exchange composite index on the same basis, with the base date of 9 January 1981 representing 100.

Newsday, owned by Times Mirror Corporation, has a circulation of over a half million, making it the 11th largest daily newspaper in the United States. It serves the Nassau and Suffolk counties on Long Island—just a 30-minute train ride from New York City.
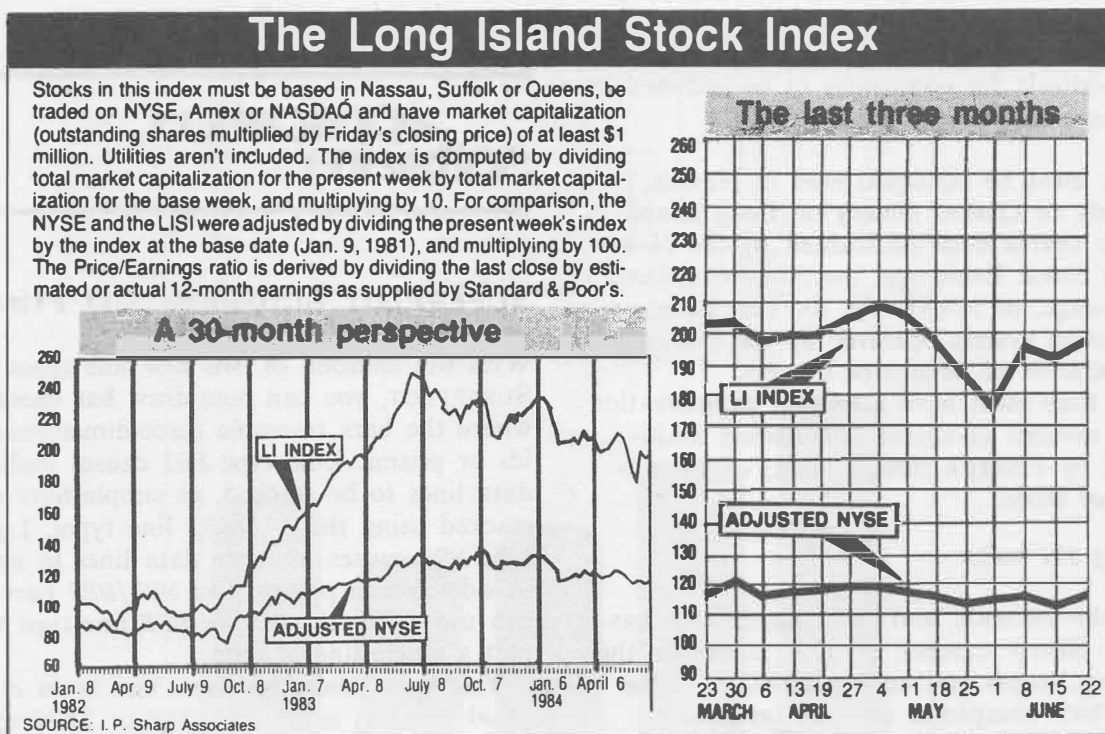
"I had wanted to do an index on the Long Island economy for over a year", says Wax. "And when Steve Kane and Ginny Marshalek from I. P. Sharp's New York office sold Mary Ann Skinner in our research department on using your data bases, it all seemed possible.

"As a business reporter, I need economic and business-related data quickly," explains Wax. "And although we have press clippings in our library, it wasn't efficient enough. Now I can just call Mary Ann and she supplies the data from the data bases. We can get stock quotes and track them easily. So the online data bases serve two purposes—for research and for the index and the list of the approximately 150 stocks with prices that make up the index."

It took about six months to develop the index. This involved determining the base period, deciding on the number of companies and the criteria for inclusion, and then for I. P. Sharp to write the programs.

Producing the index

Now the index runs every Monday in the Business Section. I. P. Sharp updates the data bases Friday nights, after the close of the

The Long Island Stock Index

Stocks in this index must be based in Nassau, Suffolk or Queens, be traded on NYSE, Amex or NASDAQ and have market capitalization (outstanding shares multiplied by Friday's closing price) of at least $1 million. Utilities aren't included. The index is computed by dividing total market capitalization for the present week by total market capitalization for the base week, and multiplying by 10. For comparison, the NYSE and the LISI were adjusted by dividing the present week's index by the index at the base date (Jan. 9, 1981), and multiplying by 100. The Price/Earnings ratio is derived by dividing the last close by estimated or actual 12-month earnings as supplied by Standard & Poor's.

The Long Island Stock Index as it appeared in Newsday on 25 June 1984.

...*Newsday* Tracks the News

markets. Saturday morning, *Newsday* accesses the data for the index and the stock listing via a standard terminal. The data is then downloaded to the *Newsday* computers for layout and photocomposition, and the art department prepares the graphics for the charts.

As a group, Long Island stocks have dramatically outperformed the stock market—in both up and down markets. That, according to analysts, is because of the Island's high concentration of smaller, high-technology firms and because it lacks the energy firms and heavy industry that have suffered so much during the past recession. The *Newsday* Long Island Stock Index is evidence of the strong performance of Long Island companies in the stock market. The index can also serve as somewhat of a guide to the economic outlook for the Island, because, analysts say, stock market indicators generally lead the economy by about four to six months, reflecting investors' expectations of what will take place in the economy.

The Long Island economy is growing, according to the index. Going back to January 1981, 100 companies qualified. In June 1983, the index began with 140 companies meeting the criteria and now there are 150.

The criteria for companies to be included in the index are:

• They must be headquartered in Nassau, Suffolk or Queens county on Long Island.
• Their shares must be tracked by the New York Stock Exchange, the American Stock Exchange, or NASDAQ, the automated quotation system operated by the National Association of Securities Dealers.
• And they must have a market capitalization (the number of shares outstanding multiplied by Friday's closing price) of $1 million or more.

Creating the index

Using the USSTOCK and DISCLOSURE data bases, I. P. Sharp screened all U.S. stocks on the major exchanges and on NASDAQ to determine which companies met the criteria. A weighted average for the group was calculated using the weekly closing price for each of the stocks. January 9, 1981 was chosen arbitrarily

as the base date. The closing on that date represents a base of 100. In weighting the index, I. P. Sharp used a method utilized frequently in such indexes, including Standard & Poor's 500-stock average. The market capitalization of all the companies at the close of each week is totalled and then divided by the capitalization for the base period. The resulting number is then multiplied by 100.

"The index has been well received," says Wax, "and the Long Island business community takes great interest in it. As a matter of fact, one bank that runs a discount brokerage service takes an ad out on the same page as the index week after week. Their ad copy reflects the performance of the stocks that are listed. And the *Long Island Business Review*, a booster publication for business, often cites the index. The index gives a feel for the local economy. Sometime in the future, I'd like to run another index of companies located off island which affect Long Island too."

According to Wax, regional indexes are not a new idea. "The *Miami Herald* does it and so does a paper in North Carolina. I don't know how they do it. But the cost for us has been reasonable. And the index has been prestigious for *Newsday*, since no one else in the region is doing it." ■

application software

SUPERPLOT Introduces 3-D Prisms

With the addition of two new line types in SUPERPLOT, you can now draw **bar charts** where the bars resemble three-dimensional solids or prisms. Line type *PRI* causes multiple data lines to be stacked, as simple bars are stacked using the *SHA/SHI* line types. Line type *MPR* causes multiple data lines to appear in side-by-side prisms, like *MBR/MBS* bars. You can use either the *PRI* or *MPR* line type to plot a single line of data.

You select these two new line types in the usual manner, using the *LINE* or *TYPE* option. In addition, the *LINE* option has been extended so you can select a solid shading colour different from the outline colour.

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The Rank Operator

In the past, the operator $\ddot{\circ}$ (on) applied only to two functions to provide composition. As of May 1983, it accepts an integer right argument (as in $,\ddot{\circ}2$) to specify the rank, or ranks, of the subarrays to which the function applies. In this context, $\ddot{\circ}$ is referred to as the rank operator. For example:

```
A←2 3 4ρι24

,⸚2 A
 1  2  3  4  5  6  7  8  9 10 11 12
13 14 15 16 17 18 19 20 21 22 23 24

,⸚¯1 A
 1  2  3  4  5  6  7  8  9 10 11 12
13 14 15 16 17 18 19 20 21 22 23 24
```

As illustrated above, a non-negative argument specifies the number of **final** axes to which the function applies. A negative argument specifies the **complementary** rank, that is, the number of **leading** axes to be **excluded**. The magnitude of the argument serves only to limit the number of axes; for the A given above, $F\ddot{\circ}4\ A \leftrightarrow F\ddot{\circ}3\ A$, and $F\ddot{\circ}\,{}^{-}4\ A \leftrightarrow F\ddot{\circ}\,{}^{-}3\ A$.

In the dyadic case two ranks (or complementary ranks) are specified. For example:

```
E←2 2ρ'ABCD'
F←2 2ρ'1234'
E,⸚1 2 F
```
```
A12
B34

C12
D34
```

```
E,⸚0 0 F
```
```
A1
B2

C3
D4
```

The most general right argument of $\ddot{\circ}$ is a three-element vector whose successive elements specify the monadic, left, and right ranks. A shorter argument R is extended so that $F\ddot{\circ}R \leftrightarrow F\ddot{\circ}(\phi3\rho\phi R)$. If the right argument of rank is a scalar, and the resulting derived function is used dyadically, that number will specify the rank of both arguments.

An expression such as $F\ddot{\circ}R\ A$ introduces the possibility of juxtaposing constants (R and A). If R is a constant, and if the expression defining A begins with a constant, then the division between the two constants must be made clear to prevent them from being treated as a single vector. For example, the sequence

```
A←2 3 4ρι24
R←2
,⸚R A
```

cannot be written in a single line as

```
,⸚2 2 3 4ρι24
```

but must be written in a form which separates the vector constants. For example:

```
,⸚(2) 2 3 4ρι24

,⸚2 (2 3 4)ρι24

,⸚2 A←2 3 4ρι24

,⸚2⊢ 2 3 4ρι24
```

T1

... The Rank Operator

If a function has rank R, then the subarrays along the last R axes of its arguments are the **cells** of the array. The remaining axes are the **frame** of the array. Consider the expression ⌸A, where A has the shape 8 7 6 5 4. ⌸ has argument rank 2. The cells are arrays of shape 5 4 and the frame has shape 8 7 6.

In contrast, consider the expression ⌊A, using the same array A. ⌊ has argument rank 0. The cells are scalars, that is, arrays of shape ⍳0 and the frame is an array of shape 8 7 6 5 4.

A function applies independently to each cell (or pair of cells, if dyadic) to produce result cells, which must be of common shape. The result is formed by assembling the frame of result cells into an array.

If a function F has rank R, then the result of F ω is determined by:

1) applying F to each of the **cells** of shape $(-R)\uparrow\rho\omega$
2) producing results with a **common shape** SIR for each
3) assembling the whole into a result of shape $((-R)\downarrow \rho\omega),SIR$

The frames of the arguments of a dyadic function must match in shape, or one of them must be a scalar. If the frame is a scalar, it is extended by reshaping it to match the shape of the other frame. This is a generalization of scalar extension.

By convention, if the frame is empty (that is, $0\epsilon(-R)\downarrow\rho\omega$), then the empty vector is used as the result cell shape.

Examples

Common uses for the rank operator include:

1) applying functions of infinite rank (such as enclose and ravel) to subarrays within multidimensional arrays
2) applying scalar functions (such as addition) in ways that would not otherwise be possible under the rules of ordinary scalar extension

The following examples illustrate uses of the rank operator.

```
V←⍳5  ◇  X←10×⍳4  ◇  Y←100×⍳3
M←3 4ρ⍳12  ◇  N←?M  ◇  B←3 4 5ρ⍳60
Q←2 5ρ'ABCDEEDCBA'
⎕PS←¯1 1 3 3
```

Examples with enclose

```
      <⍥0 M                    Enclose each (scalar)
 |¯|  |¯|   |¯|   |¯|          element
 |1|  |2|  |3|  |4|
 |_|  |_|  |_|  |_|

 |¯|  |¯|  |¯|   |¯|
 |5|  |6|  |7|  |8|
 |_|  |_|  |_|  |_|

 |¯|  |¯¯|  |¯¯|  |¯¯|
 |9|  |10|  |11|  |12|
 |_|  |__|  |__|  |__|
```

```
       <⍥1 M            Enclose rows
 |¯¯¯¯¯¯¯|  |¯¯¯¯¯¯¯|  |¯¯¯¯¯¯¯¯¯¯|
 |1 2 3 4|  |5 6 7 8|  |9 10 11 12|
 |_____|  |_____|  |_____|
```

```
       <⍥2 B                Enclose matrices
 |¯¯¯¯¯¯¯¯¯¯¯¯¯¯|  |¯¯¯¯¯¯¯¯¯¯¯¯¯¯¯¯¯|  |¯¯¯¯¯¯¯¯¯¯¯¯¯¯¯¯¯|
 | 1  2  3  4  5|  |21 22 23 24 25|  |41 42 43 44 45|
 | 6  7  8  9 10|  |26 27 28 29 30|  |46 47 48 49 50|
 |11 12 13 14 15|  |31 32 33 34 35|  |51 52 53 54 55|
 |16 17 18 19 20|  |36 37 38 39 40|  |56 57 58 59 60|
 |_____|  |_____|  |_____|
```

Examples with grade

```
      N
 1 2 3 4
 2 4 6 1
 1 6 8 1
```

```
      ⍋⍥1 N          Upgrade each row
 1 2 3 4            independently
 4 1 2 3
 1 4 2 3
```

```
      ⍉ ⍋⍥1 ⍉N       Independent upgrade
 1 1 1 2            of each column
 3 2 2 3
 2 3 3 1
```

technical supplement

... The Rank Operator

```
      Q ⍋⍤1 'ABCDEF'  Upgrade with multiple
1 2 3 4 5 6           collating sequences
5 4 3 2 1 6
```

Example with ravel

```
      ,⍤2 B            Ravel each matrix
 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
```

Example with iota

```
      M ⍳⍤1 N          Independent search on
1 2 3 4                rows, as in
5 5 2 5                M[1;]⍳N[1;], etc.
5 5 5 5
```

Examples with addition

```
      X +⍤1 M          Add scalars to rows,
11 22 33 44            as in M+(⍴M)⍴X
15 26 37 48
19 30 41 52
```

```
      ⍉ Y +⍤1 ⍉M       Add scalars to columns,
101 102 103 104        as in M+⍉(⌽⍴M)⍴Y
205 206 207 208
309 310 311 312
```

```
      Y +⍤ 0 2 B       Add scalars to matrices
101 102 103 104 105
106 107 108 109 110
111 112 113 114 115
116 117 118 119 120

221 222 223 224 225
226 227 228 229 230
231 232 233 234 235
236 237 238 239 240

341 342 343 344 345
346 347 348 349 350
351 352 353 354 355
356 357 358 359 360
```

Acknowledgements

Contest 13

Many an APL programmer is faced with the task of efficiently reexpressing the solution to a problem which can be stated quite easily in an inefficient manner. Such problems make ideal APL contests because they have the pleasant side effect of adding to our repertoire of useful APL phrases.

APL programmers must also be able to recognize when the solution to an abstract problem is applicable to their practical one at hand. I hope that many will find the solution to this contest applicable to problems in diverse fields.

Consider a production schedule consisting of two vectors. The first is work to be done, measured in some unit, say hours. The second is the capacity to perform that work, measured in the same units. If work is not performed, it is carried forward. Excess capacity however, cannot be carried forward.

In this problem, we wish to compute *WORKDONE*, subject to the recurrence relationship:

WORKDONE[I] ↔ CAPACITY[I]⌊(+/I↑WORK)-+/(I-1)↑WORKDONE

(In origin 1)

So the challenge is to write a dyadic function *TODO* having the form:

∇WORKDONE←CAPACITY TODO WORK∇

The following are sample inputs and outputs to the function *TODO*:

```
      3 1 5 TODO 1 2 3
1 1 4

      1 2 3 TODO 3 1 5
1 2 3
```

...Contest 13

Entries will be judged in terms of functionality, elegance, cost, and any other factors required to identify a unique winner. $\Box APPEND$ entries as enclosed arrays to file 999 *CONTEST*, on the I. P. Sharp Online Service, no later than **15 September 1984**. The first element of the enclosed array should contain your name, address, and organization affiliation (and I. P. Sharp MAILBOX code), and the second component the $\Box CR$ of the function, for example:

```
'999 CONTEST' ⎕STIE 1
('DOUG FORKES, IPSA, SUITE 1900, ETC., DLF'⊃⎕CR'TODO')⎕APPEND 1
```

You may also mail your solution to:

Doug Forkes
I. P. Sharp Associates Limited
Suite 1900
2 First Canadian Place
Toronto, Ontario
Canada M5X 1E3

I. P. Sharp MAILBOX code: *DLF*

The basic SHARP APL/PC package will be awarded to the person who is not an employee of I. P. Sharp submitting the best entry. The employee who submits the best entry will receive a book of his or her choice.

The workspace 999 *CONTEST* on the I. P. Sharp Online Service will store the terms of this contest and the winning solutions. Good luck, and the results will be announced in a future issue. ∎

Doug Forkes, Toronto

Correction

In the article "Working with Character Matrices", *Technical Supplement 50*, May/June 1984, the function shown in figure 1 on page T5 is incorrect. The last line should read:

```
[7]    R←(∧/X=Y[R;])∧R≠⎕IO+(1↑ρY)-1
```

...SUPERPLOT Introduces 3-D Prisms

Using a new option called *PRISM*, you can control the number of sides of the prism (the default is a rectangular prism with four sides). Specifying six sides gives you hexagonal prisms similar to those available in the public workspace 760 *HEXPLOT*. The prisms may be plotted *face front* or *edge front*; that is, with a face of the prism facing the viewer, or with an edge facing the viewer. Face front implies that an edge of the prism lies along the x axis; edge front implies that just a corner of the prism touches the x axis. Edge front is the default for three-sided prisms; face front is the default for any other number of sides.

Also, the top of the prism (or stack of prisms) may be the same as, or different from, the sides of the top segment in the stack. If it's the same, it will have the same outline colour and style, and the same solid shading as the top segment. For example, the top might be drawn in outline only, though the sides are solidly shaded; or the top might be solidly shaded in black, while the sides are coloured. These features are all controlled by the *PRISM* option.

More details on *PRI* and *MPR* line types are available in SUPERPLOT *NEWS*, items 51 and 58; extension of the *LINE* option to specify solid shading is detailed in item 53. To access SUPERPLOT *NEWS*:

```
)LOAD 3 SUPERPLOT
DSUPERPLOT 'NEWS,51 58;'
```

Linda Furrow, Calgary

A Simple MPR Plot

A More Complex PRI Plot
with solid shading and different tops
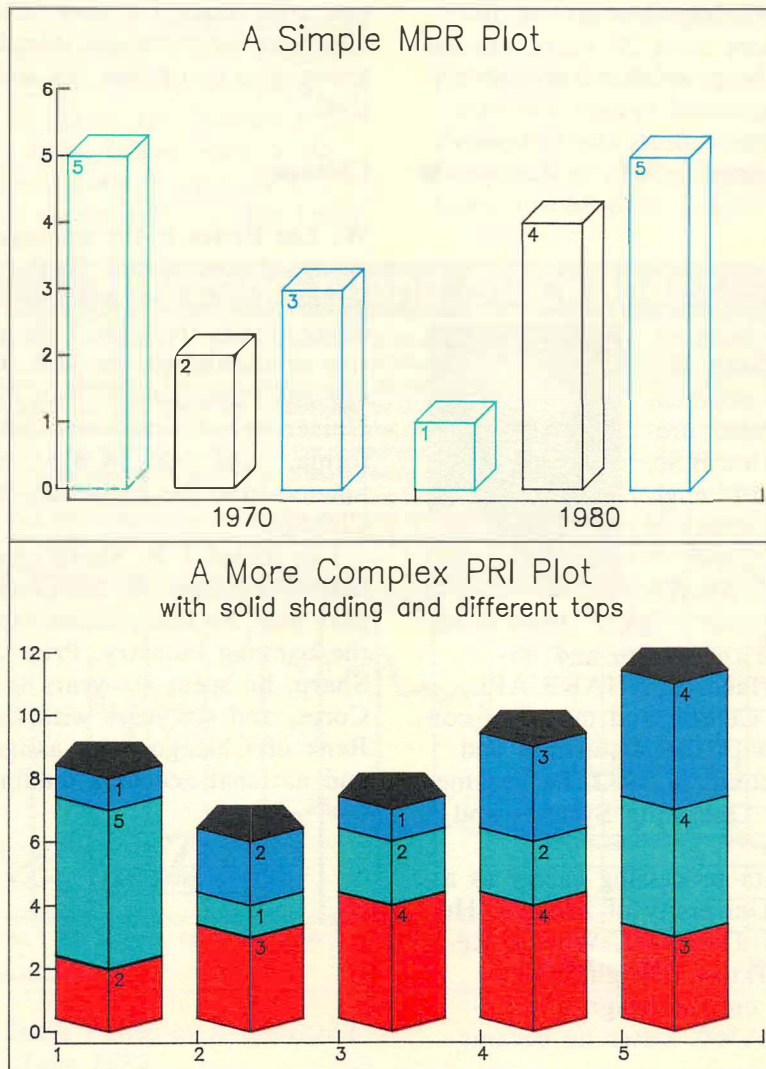
London

Eric Iverson has been appointed managing director of Europe, based in the London, England, office. He joined I. P. Sharp Associates in 1968 as a system programmer. In 1972, he was the project manager for the development of the Siemens APL system in Heidelberg.
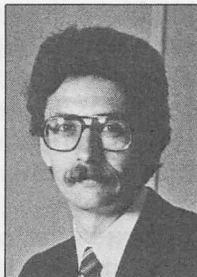
On his return to Toronto in the summer of 1973, Eric became manager of the APL Development Group. In 1976, in addition to his previous responsibilities, he took on the position of data processing manager at I. P. Sharp's international headquarters.

Eric has been significantly involved in five different SHARP APL implementations and has used APL for more than 20 years. He has also been active in the promotion and delivery of SHARP APL distributed system software. His recent appointment reflects the company's commitment to continued growth in Europe. ∎

Toronto

Richard Lathwell has been appointed manager of the Research and Development Group. He is a licensed professional engineer with a B.Sc. degree in mechanical engineering from the University of Alberta.
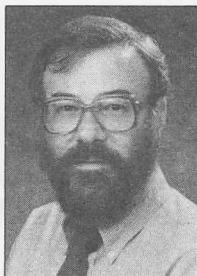
Dick joined I. P. Sharp's APL Development Group in 1977. He was involved primarily with the design and implementation of interfaces to SHARP APL, support of the Data Centre, and customer consultation concerned with the acquisition and application of computers. In 1982, he became product manager for Operating Systems and Auxiliary Processors.

Dick began his data processing career as a programmer at the University of Alberta. He then joined the IBM Thomas J. Watson Research Center in Yorktown Heights, New York, to collaborate on the design and implementation of APL\360. Later he became manager of APL Implementation and System Design at the IBM Philadelphia Scientific Center, where he developed APLSV. Finally, in the IBM APL Design Group, he worked on the development of APL for the IBM 5100 Personal Computer. ∎

International Banking Support Group

The International Banking Support Group coordinates I. P. Sharp's marketing and support to international banks world wide. The members of this team all have strong backgrounds in finance and economics, and a clear understanding of the needs of the banking community. They have been responsible for the development of the Global Limits Control System and customized systems in areas such as Portfolio Analysis, Budgeting, Country Risk Analysis, and Asset/Liability Management. In addition to the members introduced here, the group also comprises the technical support staff.

Chicago

W. Lee Bettes is the manager of the International Banking Support Group. He has a B.A. in economics from the University of Oklahoma, an M.S. in systems management from the University of Southern California, and an M.B.A. in finance from the University of Chicago.

Lee joined I. P. Sharp three years ago as branch manager of the Chicago office. This past year he has concentrated his efforts in the banking industry. Prior to joining I. P. Sharp, he spent six years in the U.S. Marine Corps, and six years with the First National Bank of Chicago, with assignments in systems and national accounts lending.

London

Bob Hayim is the European banking products manager. He completed his Bachelor's degree in economics and a Master's in Business Administration, specializing in corporate strategy.

Before joining I. P. Sharp, he worked in management consulting for one year, and two years in a contract management group. Since coming to I. P. Sharp, Bob has been involved exclusively with the packaging and marketing of banking products within Europe.

Mark Rudland joined I. P. Sharp this year as the London sales and support consultant for the banking group. Before joining I. P. Sharp, he worked, for three and a half years, in the London office of the Bank of America in their European, Middle East and Africa division treasury office.

Mark graduated from Kingston Polytechnic with a B.A. in business studies.

New York

Richard C. Storey joined I. P. Sharp this year as the banking products manager for the U.S. Dick earned his Bachelor's degree in history from Boston University, and studied advanced Chinese language at Taiwan Normal University.

He spent three years overseas working in Taiwan. He then joined Manufacturers Hanover Trust in their management training program. He worked in their international department, Far Eastern Section, for three years. His assignments involved working with Hong Kong, People's Republic of China, Korea and Taiwan. ∎
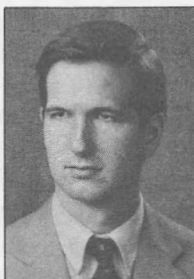
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CITIBASE and CITIFORECAST Data Bases *(revised)*

Citicorp Information Services provides U.S. economic statistics from more than 100 government and private sources for the CITIBASE data base. The data base includes: National Income and Product Accounts, data from the *Business Conditions Digest* and Federal Reserve Board publications, producers' and consumers' price indices, wholesale and retail sales, construction and housing starts, unemployment and employment, and the workweek and average earnings. CITIFORECAST contains 250 quarterly macroeconomic time series that predict statistics for the major segments of the U.S. economy.

This manual is completely revised. The most recent versions of the CITIBASE and CITIBASE WEEKLY directories come with the manual as a separate supplement.
Manual: July 1984, 36 pp., $4.00
Directories: June 1984, 200 pp., $12.00

COMMODITIES Data Base *(revised)*

The COMMODITIES data base comprises daily prices, volumes, and open interest for all major commodities traded on the London, New York, Chicago, Kansas City, Minneapolis, Winnipeg, and Toronto/Montreal futures markets. It includes both metals and soft commodities, with time series data available for: opening and closing prices, high and low prices, volume (number of contracts traded), and open interest (number of contracts outstanding). The information is given in the form of life-of-contract series and continuation series.
April 1984, 62 pp., $6.00

Aviation Data Bases Reference Guide *(revised)*

The *Aviation Data Bases Reference Guide* contains all the information you need to access any of the 10 aviation data bases available from I. P. Sharp Associates. The data bases are arranged by category—Financial, Operating and Traffic Statistics; Flight Schedules; and Origin and Destination Traffic Statistics.

Within the categories, they are grouped according to similar data content.

Each data base is described complete with a list of facts available, sample series codes, symbols and numbers for each data base, and directions for producing a complete list of series and fact codes. The guide also explains how to access the data and shows a sample access for each workspace.
June 1984, 63 pp., $5.00

Economic Data Bases Reference Guide *(revised)*

This reference guide is designed to help you access all 32 economic data bases available through I. P. Sharp. If you are already familiar with one or more of the data bases, you can quickly obtain data from these and incorporate it with that from other, perhaps less familiar, data bases.

The contents of each data base are described, and instructions on how to access the data are given. You can access all of the economic data bases via one or more of three software systems—INFOMAGIC, a straightforward, user-friendly means of accessing a variety of reports; MAGIC, a slightly more sophisticated method of retrieval aimed at a nontechnical user; and RETRIEVE, for APL users who want to integrate information into their own tailored systems.
June 1984, 80 pp., $6.00

Energy Data Bases Reference Guide *(revised)*

This comprehensive guide serves as a complete reference for 84 energy data bases available online from I. P. Sharp Associates. All the information you need is presented here in a concise format—so you can produce the report, table or graph you require in a matter of minutes.

The guide contains an introduction to the various methods of accessing the data and a subject guide to identify the data bases covering the area of interest. Each data base entry contains a description of the data base, a list of sample codes for each fact, directions for printing a complete and up-to-date list, instructions to access the data, and other pertinent information.
May 1984, 185 pp., $10.00

publications

...Bookends

Microcomputer Products

MICROCOMM *(revised)*

MICROCOMM is a microcomputer product which IBM Personal Computer users can use to communicate with the I. P. Sharp Network. Using MICROCOMM, you can quickly and conveniently sign on to the I. P. Sharp Online Service to access information in the I. P. Sharp public data bases, and transfer data between the I. P. Sharp system and IBM PC files. Included in the package is the *MICROCOMM Users' Guide* and diskette.

MICROCOMM Version 2.1 features support for)*TERMINAL NULLS*, and friendlier handling of Hayes Smartmodems and Smartmodem cards. In addition, you now return directly to DOS after a MICROCOMM session. File extension .DIF is no longer applied by MICROCOMM.
April 1984, 32 pp. + diskette, CDN$60.00

PLOTCOMM *(new)*

IBM Personal Computer users can now produce graphics on a colour graphics monitor attached to a PC, with PLOTCOMM. PLOTCOMM gives you the power of SUPERPLOT combined with MICROCOMM. With PLOTCOMM, you sign on to the I. P. Sharp Online Service using the IBM PC as an intelligent terminal on the I. P. Sharp Network. Then you can load any workspace containing SUPERPLOT to produce plots using data from I. P. Sharp public data bases or from your own private data bases. (See the article in the May/June 1984 issue of the *I. P. Sharp Newsletter*.) This microcomputer product comes complete with a users' guide and diskette.
May 1984, 35 pp. + diskette, CDN$100.00

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