Inside Module 6

Working with Suprlink

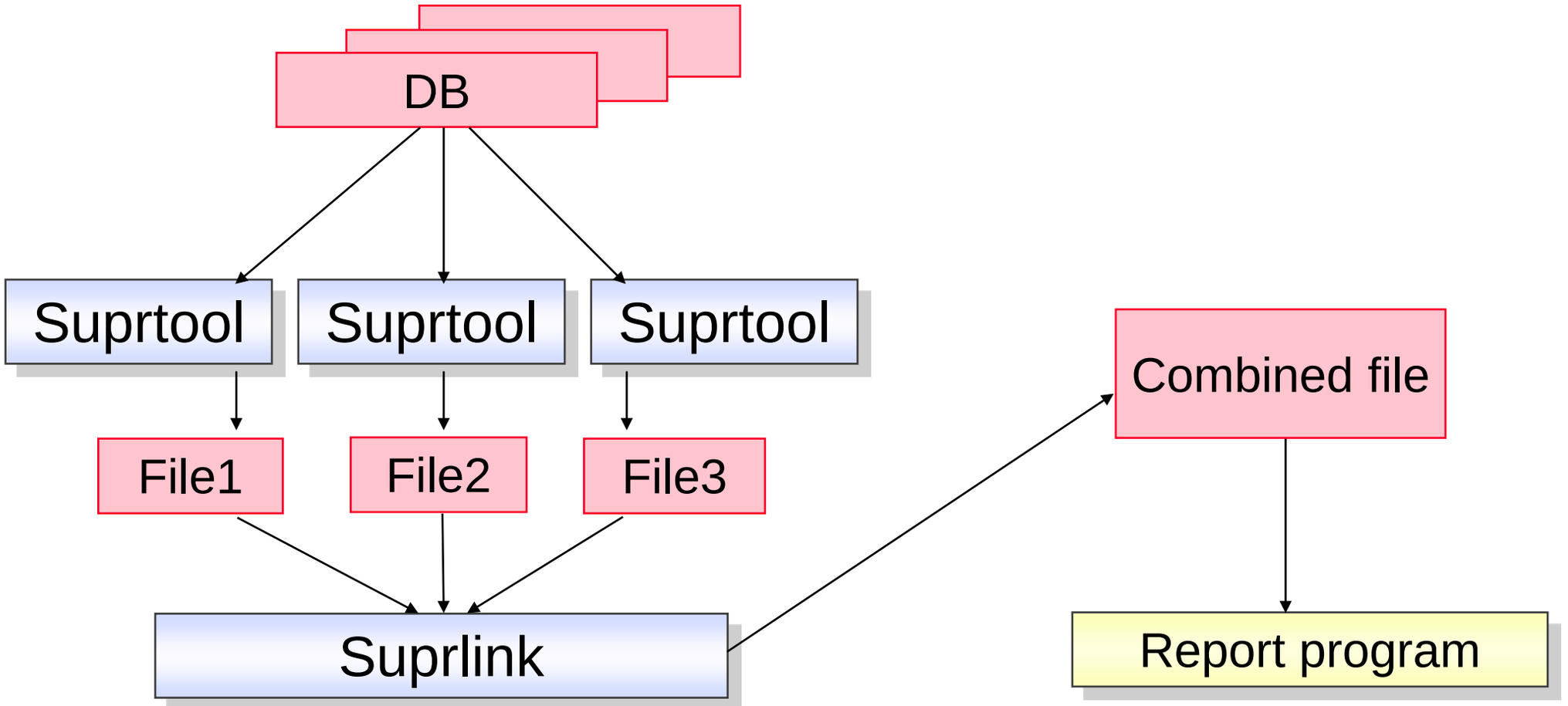
Suprlink expands Suprtool capabilities

Suprlink

- Adds multi-file linking to Suprtool's remarkable speed
- Works on IMAGE, KSAM, and MPE files
- Merges up to 8 files into one
- Creates one sorted file as input to your report programs

> *"We love Suprtool's speed, but couldn't we have multiple dataset extracts too?"*

Suprlink ties your data together



Three ways to access Suprlink

- Use the RUN command to use Suprlink directly

```
:run suprlink.pub.robelle
+input file1
+link file2
+output file3
+exit
```

- Use the Suprtool LINK command to start Suprlink

```
:run suprtool.pub.robelle
>link
+input file1
+link file2
+output file3
+exit
>
```

Three ways to access Suprlink continued

- Use Suprtool's LINK command to pass commands to Suprlink

```
:run suprtool.pub.robelle
>link input file1
>link link file2
>link output file3
>link exit
```

- On HP-UX run Suprlink directly.

  –/opt/robelle/bin/suprlink

I need all invoices over $100 for British Columbia customers, now!

- Step 1: Identify the required data, and their sources
- Step 2: Use Suprtool to select and sort records from each dataset or file, extracting the required fields
- Step 3: Link the extracted files
- Step 4: Produce the report from the linked file

What should the report look like?

```
May 12, 1996  9:18                  BC Sales over $100          Page 1

Account#  Name                    Purch Date      Amount    Product#

   10003  Melander   John          19931015      112.07    50511501
                                   19931015      166.00    50512501
                                   19931015      219.10    50513001
   10020  Nisbet     Walley        19931001      224.15    50511501
                                   19931028      167.13    50512501
```

Step 1: Where are the records located?

- Suprtool's FORM SETS command lists all the sets in a database opened with the BASE command, and describes their attributes
- Use the FORM *dataset* command to list field names in a dataset
- Use COBOL Copylib or Cognos Qschema listings to get the layouts of non-IMAGE files

What datasets are in the Store database?

```
:run suprtool.pub.robelle
>base store.demo
>form sets
```

```
Database: STORE.DEMO.ROBELLE
                 Set        Item                 Entry    Load    Entry
Sets:            Num Type   Count   Capacity     Count    Factor  Length   B/F
   M-CUSTOMER    1   M      9       211          20       9  %    55       7
   M-PRODUCT     2   M      3       307          13       4  %    24       12
   M-SUPPLIER    3   M      6       211          3        1  %    49       8
   D-INVENTORY   4   D      6       462          13       3  %    15       22
   D-SALES       5   D      8       602          8        1  %    19       14
```

What fields are in the m-customer dataset?

```
>form m-customer
Database: STORE.DEMO.ROBELLE
   M-CUSTOMER        Master    Set# 1
     Entry:                      Offset
       CITY                    X12     1
       CREDIT-RATING           J2     13
       CUST-ACCOUNT            Z8     17  <<Search Field>>
       CUST-STATUS             X2     25
       NAME-FIRST              X10    27
       NAME-LAST               X16    37
       STATE-CODE              X2     53
       STREET-ADDRESS          2X25   55
       POSTAL-CODE             X6    105
   Capacity: 211 (7)  Entries: 20  Bytes: 110
```

What fields are in the d-sales dataset?

```
>form d-sales

Database: STORE.DEMO.ROBELLE
  D-SALES              Detail     Set# 5
     Entry:                          Offset
     ➡ CUST-ACCOUNT                  Z8       1   (!M-CUSTOMER)
       DELIV-DATE                    J2       9
     ➡ PRODUCT-NO                    Z8      13   (M-PRODUCT)
       PRODUCT-PRICE                 J2      21
     ➡ PURCH-DATE                    J2      25
       SALES-QTY                     J1      29
       SALES-TAX                     J2      31
     ➡ SALES-TOTAL                   J2      35
  Capacity: 602 (14)  Entries: 8  Bytes: 38
```

Step 2: Extracting and sorting records

- First, we need to read all the customer records of British Columbia customers and extract the cust-account, name-last, and name-first fields
- Next, we have to read all the records of invoices over $100 and extract the cust-account, product-no, purch-date, and sales-total fields
- The cust-account field is common to both records, so we will sort both files by this cust-account

Reading records of British Columbia customers

- Use Suprtool to select and sort British Columbia customers

```
>get m-customer
>if state-code = "BC"
>sort cust-account
>extract cust-account,name-last,name-first
>output custfile,temp,link
>xeq
```

List of British Columbia customers

```
>input custfile;list standard;xeq
CUST-ACCO       NAME-LAST       NAME-FIRST
     10001      Hamilton        Darlene
     10002      Lackner         Gordon
     10003      Melander        John
     10008      Sarafin         Thomas
     ...
     10020      Nisbet          Walley
```

What is a self-describing file?

- It is a standard MPE disc file
- It has user labels that contain a mini-dictionary describing record structures
- Use the FORM command to see the structure

Suprlink requires self-describing (SD) files

- Suprlink uses self-describing files as input and creates SD files as output

- The LINK option of the Suprtool OUTPUT command specifies a self-describing file

```
>output custfile,temp,link
```

- In our example, Custfile and Tranfile are self-describing files that Suprlink can use as input

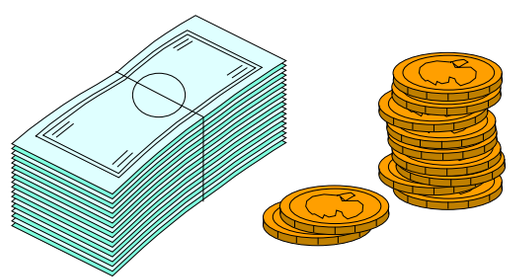
Reading records of invoices over $100

- Use Suprtool again to select and sort records with invoices greater than $100

```
>get d-sales
>item sales-total,decimal,2
>if sales-total > 100.00
>sort cust-account
>sort purch-date
>extract cust-account,sales-total,purch-date,product-no
>output tranfile,temp,link
>xeq
```

List of invoices over $100

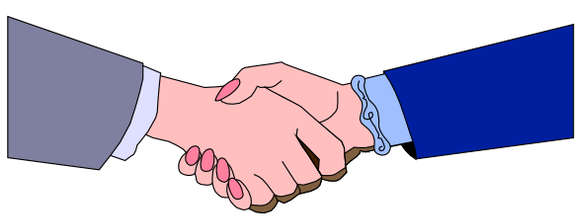
```
>input tranfile;list standard;xeq
CUST-ACCO  SALES-TOTAL  PURCH-DATE PRODUCT-NO
  10003      112.07       19931015   50511501
  10003      166.00       19931015   50512501
  10003      219.10       19931015   50513001
  10016      159.42       19931021   50532001
  10020      224.15       19931001   50511501
  ...
```



Step 3: Linking customer and invoice records

- Use Suprlink to merge the extracted records

```
:run suprlink.pub.robelle
+input tranfile
+link custfile
+output reptfile,temp
+exit
```



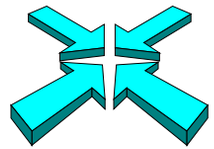
What is the structure of the merged file?

```
>form reptfile
File: REPTFILE.DATA.SALES      (SD Version B.00.00)
  Entry:                    Offset
    CUST-ACCOUNT            Z8       1  <<Sort# 1 >>
    SALES-TOTAL             I2       9                  << .2  >>
    PURCH-DATE              I2      13  <<Sort# 2 >>
    PRODUCT-NO              Z8      17
    NAME-LAST               X16     25
    NAME-FIRST              X10     41
  Limit: 6  EOF: 5  Entry Length: 50  Blocking: 81
```

How does the merged file look?

```
>input reptfile;list standard;xeq

CUST-ACCO SALES-TOTAL PURCH-DATE  PRODUCT-N  NAME-LAST  NAME-FIRST
  10003   112.07      19931015    50511501   Melander   John
  10003   166.00      19931015    50512501   Melander   John
  10003   219.10      19931015    50513001   Melander   John
  10020   224.15      19931001    50511501   Nisbet     Walley
  10020   167.13      19931028    50512501   Nisbet     Walley
  ...
```



How does the link work?

Input file - 6 records

```
10003   112.07   19931015   505
10003   166.00   19931015   505
10003   219.10   19931015   505
10016   159.42   19931021   505
10020   224.15   19931001   505
10020   167.13   19931028   505
```

Link file - 12 records

```
10001   Hamilton    Darlene
10002   Lackner     Gordon
10003   Melander    John
10008   Sarafin     Thomas
10009   Oxenbury    Gordon
10010   Humphreys   Wayne
10011   Kirk        William
10012   Ferguson    Percy
10013   Andersen    Colin
10020   Nisbet      Walley
```

How the link works

Input file - 6 records

10003	**112.07**	**19931015**	**505**
10003	**166.00**	**19931015**	**505**
10003	**219.10**	**19931015**	**505**
10016	159.42	19931021	505
10020	224.15	19931001	505
10020	167.13	19931028	505

Link file - 12 records

10001	Hamilton	Darlene
10002	Lackner	Gordon
10003	**Melander**	**John**
10008	Sarafin	Thomas
10009	Oxenbury	Gordon
10010	Humphreys	Wayne
10011	Kirk	William
10012	Ferguson	Percy
		olin
		alley

Output file - 5 records

10003	**112.07**	**19931015**	**50511501**	**Melander**	**John**
10003	**166.00**	**19931015**	**50512501**	**Melander**	**John**
10003	**219.10**	**19931015**	**50513001**	**Melander**	**John**
10020	224.15	19931001	50511501	Nisbet	Walley
10020	167.13	19931028	50512501	Nisbet	Walley

What happens if we reverse the linking order?

```
>link input custfile
>link link tranfile
>link output reptfile,temp
>link xeq


>input reptfile;list standard;xeq

CUST-ACCO  NAME-LAST  NAME-FIRST  SALES-TOTAL  PURCH-DATE  PRODUCT-N
  10003    Melander   John        112.07       19931015    50511501
  10020    Nisbet     Walley      224.15       19931001    50511501

  ...
```

Reversing the input and link files

Input file - 12 records

10001	Hamilton	Darlene
10002	Lackner	Gordon
10003	**Melander**	**John**
10008	Sarafin	Thomas
10009	Oxenbury	Gordon
10010	Humphreys	Wayne
10011	Kirk	William
10012	Ferguson	Percy
10013	Andersen	Colin

Link file - 6 records

10003	**112.07**	**19931015**	**505**
10003	166.00	19931015	505
10003	219.10	19931015	505
10016	159.42	19931021	505
10020	224.15	19931001	505
10020	167.13	19931028	505

Output file - 2 records

10003	**Melander**	**John**	**112.07**	**19931015**	**50511501**
10020	Nisbet	Walley	224.15	19931001	50511501

What if an invoice does not match a customer record?

- By default, Suprlink drops *input* records without a matching record in the link file
- Specify LINK OPTIONAL to override this default and include unmatched input records
- LINK OPTIONAL does not include *link* records without a matching record in the input file

Including unmatched records

```
>link input tranfile
>link link custfile optional
>link output reptfile,temp
>link xeq
```

Including unmatched input records

Input file - 6 records

```
10003   112.07   19931015   505
10003   166.00   19931015   505
10003   219.10   19931015   505
10016   159.42   19931021   505
10020   224.15   19931001   505
10020   167.13   19931028   505
```

Link file - 12 records

```
10001   Hamilton    Darlene
10002   Lackner     Gordon
10003   Melander    John
10008   Sarafin     Thomas
10009   Oxenbury    Gordon
10010   Humphreys   Wayne
10011   Kirk        William
10012   Ferguson    Percy
```

Output file - 6 records

```
10003   112.07   19931015   50511501   Melander   John
10003   166.00   19931015   50512501   Melander   John
10003   219.10   19931015   50513001   Melander   John
10016   159.42   19931021   50532001
10020   224.15   19931001   50511501   Nisbet     Walley
10020   167.13   19931028   50512501   Nisbet     Walley
```

Step 4: Produce the report

- Use your favorite report writer to format the final report, adding headings, titles, and other features
- The report writer has almost no work to do
- Use Suprtool LIST command if the reporting needs are basic

Suprtool can (almost) produce the report

```
>input reptfile
>extract cust-account,name-last,name-first,purch-date,&
>>sales-total,product-no
>list standard,title "BC Sales over $100",&
>>heading "Account#  Name                                ",&
>>"Purch Date      Amount  Product#"
>xeq
```

```
May 12, 1996 10:10          BC Sales over $100              Page 1

Account#  Name                    Purch Date    Amount     Product#

   10003  Melander   John         19931015      112.07     50511501
   10003  Melander   John         19931015      166.00     50512501
   10003  Melander   John         19931015      219.10     50513001
   10020  Nisbet     Walley       19931001      224.15     50511501
   10020  Nisbet     Walley       19931028      167.13     50512501
```

Suprlink Exercise 1

- From the Store database, find all the British Columbia supplied products that have inventories less than 20
- You should include the product number, quantity in stock, as well as the supplier's name and number

Can I add more information to the report?

- The boss has asked to see product descriptions on the report

```
May 12, 1996  9:18          BC Sales over $100          Page 1

Account#  Name                Purch Date   Amount   Product#   Product

   10003  Melander  John      19931015     112.07   50511501   Drill
                              19931015     166.00   50512501   Drill
                              19931015     219.10   50513001   Saw
   10020  Nisbet    Walley    19931001     224.15   50511501   Saw
                              19931028     167.13   50512501   Jigsaw
```

Which dataset contains product descriptions?

```
>form sets
Database: STORE.DEMO.ROBELLE

                 Set          Item                 Entry   Load    Entry
Sets:            Num  Type    Count  Capacity      Count   Factor  Length   B/F
  M-CUSTOMER     1    M       9      211           20      9 %     55       7
  M-PRODUCT      2    M       3      307           13      4 %     24       12
  M-SUPPLIER     3    M       6      211           3       1 %     49       8
  D-INVENTORY    4    D       6      462           13      3 %     15       22
  D-SALES        5    D       8      602           8       1 %     19       14
```

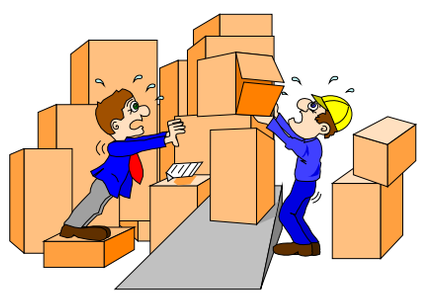
What fields are in the product dataset?

```
>form m-product

Database: STORE.DEMO.ROBELLE
  M-PRODUCT          Master     Set# 2
   Entry:                         Offset
      PRODUCT-DESC              X30      1
      PRODUCT-MODEL             X10     31
      PRODUCT-NO                Z8      41  <<Search Field>>
  Capacity: 307 (12)  Entries: 13  Bytes: 48
```

Selecting the required fields

- We want to read the product-no and product-desc fields in the product master dataset
- We want to read all the fields in Reptfile
- Product-no field is common to both records



Reading product description records

```
>get m-product
>sort product-no
>extract product-no,product-desc
>output prodfile,temp,link
>xeq
```

Re-sorting the invoices on the product field

- Suprlink input and link files must have the same sort key, so the invoices have to be re-sorted on the product-no field

```
>input reptfile
>sort product-no
>output = input
>xeq
```

Linking product descriptions to the invoices

```
>link input reptfile
>link link prodfile
>link output listfile temp
>link xeq
```

How does the new report look?

```
>input listfile
>extract cust-account,name-last,name-first,purch-date,sales-total,product-no
>extract product-desc
>list standard,title "BC Sales over $100",&
>>heading "Account#  Name                                ",&
>>"Purch Date      Amount  Product# and Description"
>sort cust-account
>sort purch-date
>xeq

Account#  Name            Purch Date    Amount  Product# and Description
  10003  Melander  John     19931015    112.07  50511501  Makita 3/8" Var. Speed Drill
  10003  Melander  John     19931015    166.00  50512501  Makita 8 1/4" Circular Saw
  10003  Melander  John     19931015    219.10  50513001  Makita 1" Jigsaw
  10020  Nisbet    Walley   19931001    224.15  50511501  Makita 3/8" Var. Speed Drill
  10020  Nisbet    Walley   19931028    167.13  50512501  Makita 8 1/4" Circular Saw
IN=5, OUT=5. CPU-Sec=1. Wall-Sec=1.
```

Suprlink Exercise 2

- Add the product price to the list in Exercise 1 (page 31)

```
SUPPLIER-   PRODUCT-N ON-HAND-QTY  SUPPLIER-NAME
  5051      50512501             7   Makita Canada Inc.
  5051      50511501             5   Makita Canada Inc.
  5051      50512001             2   Makita Canada Inc.
  5051      50513001             3   Makita Canada Inc.
  5052      50521001            10   Black & Decker
  ...
```

Specifying Link Fields

- You can specify link fields:

```
+ input tranfile by cust-account
+ link custfile by account-num
```

- Useful when files created with ,QUERY instead of ,LINK
- Also useful for specifying a secondary link key:

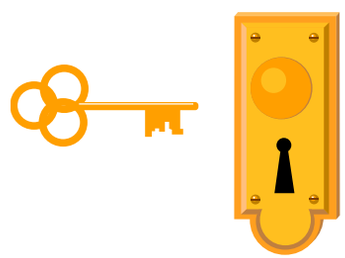
```
+ link majors by ssn cmaj
```

- If field names different in the input file:

```
+ link majors by ssn cmaj from ssn currmaj
```

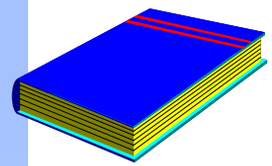
Suprlink requirements

- Suprlink requires enough disc space for the original database, each input file, the final output file, and hidden Sortscr files
- Input and link files must be self-describing files
- Input and link files must be sorted on the same key field
- Link keys can be any type except a floating-point field type



Performance guidelines

- Avoid using Suprlink if repeated sorting is required
- Minimize record sizes by only selecting necessary fields
- Minimize file sizes by only selecting required records



Summary

- Suprlink theory
- Input files versus link files
- Implied record selection
- Optional linking
- Adding more information
- Performance tips