Using Access to Create Reports from Voyager

Presented more than 60 times

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TABLES

DEFINITION:
In a relational database, a table is a collection of data, organized into rows and named columns.

<table>
<thead>
<tr>
<th>BIB_ID</th>
<th>TITLE</th>
<th>AUTHOR</th>
<th>ISBN</th>
<th>ISSN</th>
<th>DATE</th>
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<tbody>
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Rows = Records
Columns = Fields
Good database design requires adhering to some specific design standards.

Basically, you want to break data into separate tables when it is **optional** or **repeatable** or both.
BAD DATABASE DESIGN

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**INSERT:** Can't without checkout (Gary)

**DELETE:** Without checkout you lose address (Everett)

**UPDATE:** If multiple checkouts, change address many times (Alvar)
BETTER DATABASE DESIGN

In this design, there is no redundancy of data, and no problem adding, deleting or updating records.
HOW DO QUERIES WORK?

We don’t have to know how the query is executed, but we need to understand the concepts.
HOW DO QUERIES WORK?

These are the general steps in a query:

Join tables
Apply criteria
Select fields
Sort results

For this query:
Join BIB_TEXT to BIB_MFHD
Join that result to MFHD_MASTER
Discard suppressed records, records with call numbers and recent records
Select TITLE and AUTHOR fields
No sorting was requested
JOIN BIB_TEXT TO BIB_MFHD

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<th>BEGI</th>
<th>P</th>
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<th>PLAC</th>
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JOIN RESULT TO MFHD_MASTER

\[ \text{Same number of records, more fields} \]
WHAT DOES THE QUERY DO?

Final Join

Select the records with:

- `SUPPRESS_IN_OPAC = "N"`
- `DISPLAY_CALL_NO Is Null`
- `CREATE_DATE < #7/1/2003#`

Then, pull out the two fields we want:

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hosseini, Majid.</td>
<td>Ratio inequalities for heat kernels.</td>
</tr>
</tbody>
</table>
ACCESS OVERVIEW

Seven types of entities
Access DBs are just files like any others.

Copy them, create them, back them up, rename them, etc.
The standard “reports.mdb” file is created when you run the “VoyagerInstall.exe” program on your workstation. It will be replaced the next time you run “VoyagerInstall.exe”.

Copy “reports.mdb” to another folder and do all your work there.
Tables can be created directly in Access or linked. They all hold data.
LOOKING AT TABLES

You can look at the contents of tables at any time. This is a good tool for finding out what each table contains.

<table>
<thead>
<tr>
<th>RESERV</th>
<th>RESE</th>
<th>RE</th>
<th>LIST_TITLE</th>
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<td>8/11/2003</td>
<td>12/21/2003</td>
<td>33 7:42:</td>
</tr>
</tbody>
</table>
The Voyager database includes “Views”:

```
SERIALS_VW:
select
    bm.bib_id,
    lics.mfhd_id,
    c.component_id, c.component_name,
    c.component_name_norm, c.predict,
    c.next_issue_id, c.note,
    i.issue_id, i.enumchron,
    i.expected_date,
    i.receipt_date, i.received
from
    bib_mfhd bm,
    component c,
    issues_vw i,
    subscription s,
    line_item_copy_status lics
where
    bm.mfhd_id = lics.mfhd_id
and
    lics.line_item_id = s.line_item_id
and
    s.subscription_id = c.subscription_id(+)
and
    c.component_id = i.component_id (+)
```

- Views look and act like tables, but are more like queries.
All of these views returned at least the first screen of results in just a few seconds.
Each of these views took a minute or more to present even the first results.

<table>
<thead>
<tr>
<th>MINUTES TO OPEN</th>
<th>VIEWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTHHEADING_VW</td>
<td>2</td>
</tr>
<tr>
<td>AUTHORITY1XX4XX_VW</td>
<td>6</td>
</tr>
<tr>
<td>AUTHORITY5XX1XX_VW</td>
<td>4</td>
</tr>
<tr>
<td>AUTHORITYDUPE_VW</td>
<td>10</td>
</tr>
<tr>
<td>CIRCCCHARGES_VW</td>
<td>37</td>
</tr>
<tr>
<td>CIRCRENEW_VW</td>
<td>46</td>
</tr>
<tr>
<td>HEADING_VW</td>
<td>49</td>
</tr>
<tr>
<td>ISSUES_VW</td>
<td>2</td>
</tr>
<tr>
<td>ITEM_VW</td>
<td>49</td>
</tr>
<tr>
<td>LCCLASS_VW</td>
<td>2</td>
</tr>
<tr>
<td>RECORDCOUNT_VW</td>
<td>2</td>
</tr>
<tr>
<td>SERIALS_VW</td>
<td>3</td>
</tr>
<tr>
<td>VENDORINVOICE_VW</td>
<td>1</td>
</tr>
<tr>
<td>VENDORORDER_VW</td>
<td>9</td>
</tr>
</tbody>
</table>
TIME TO TRY IT OUT!

ACCESS

TABLE

EXERCISES
QUERIES

Queries have lots of functions:

✓ Select specific records
  *Books with no authors*

✓ Select specific fields
  *Author, title, publisher*

✓ Join information from multiple tables
  *Patron name, group and barcode*

✓ Group or sort records
  *Count of books by location*

✓ Any combination of the above
A SIMPLE QUERY

Author, title and call number for a book where the BIB_ID is 4:
CREATING A QUERY

The Simple Query Wizard is not helpful

Use Design View
PARTS OF A QUERY

Tables

Links/Joins

Criteria

Fields
WHICH TABLES TO CHOOSE?

Five reasons to add a table to a query:

✓ To select a field from it
✓ To apply criteria to a field
✓ To link other tables together
✓ To eliminate or add records to the result
✓ To affect sorting or grouping
LINKING TABLES

✓ Many tables will link automatically

✓ If no automatic link, drag the linking field from one table on top of the one in the other table
Tables have relationships with each other. The relationships are established by having fields in common.
The common fields must come from the same “Domain” of values. Fields don’t have to have the same name, but have to represent the same thing.

- BIB_ID
- LOCATION_ID aka PERM_LOCATION aka TEMP_LOCATION aka CHARGE_LOCATION
- ITEM_TYPE_ID
- FISCAL_PERIOD_ID aka FISCAL_YEAR_ID
- OPERATOR aka CREATE_OPID aka UPDATE_OPID aka CHARGE_OPID
- MFHD_ID
**TYPE MISMATCHES**

If you try to compare a date field to a text or numeric field, Access will complain of a type mismatch. If you try to compare a text field to a numeric field, Access won’t catch it, but Oracle will complain with an error message. It might also say, “Invalid date.” The same messages come up if you join tables by incompatible fields.
UNLINKED TABLES

If you have an unlinked table, each record from the rest of the query will be joined with each record in the unlinked table. This could be pecadillions* of records!

* A large number resulting from a small mistake (pecadillo)
WHICH FIELDS TO ADD?

Three reasons to add fields:

✓ To include them in the results
✓ To apply criteria to them
✓ To affect grouping or sorting

To include a field in your results, check the “Show” checkbox.
Put criteria on the “Criteria” line under the field to which they apply.
USING CRITERIA EFFECTIVELY

A plain value implies “equals”.

“ugrl,resv”    Text constant (case sensitive)
“83456”        Numeric constant
#7/27/2006#    Date constant (be careful)

Criteria with operators:

<> “Gift”          Not equal
Not “Approved”    Not equal
> #1/1/2006#      Greater than
< “a”             Less than
>= “10000”        Greater than or equal to
<= “200”          Less than or equal to
PATTERN MATCHING

For text fields, you can use “Like” and an asterisk to do “pattern matching”. An asterisk (*) matches any sequence of zero or more characters.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Matches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Like “main*”</td>
<td>“main”, “maintain”, “maintenance”, “mainframe”, “main street”, …</td>
</tr>
<tr>
<td>Like “*refe”</td>
<td>“refe”, “ugrl,refe”, “phys,refe”, …</td>
</tr>
<tr>
<td>Like “h*er”</td>
<td>“her”, “hiker”, “homer”, “helicopter”, “his mother”, …</td>
</tr>
<tr>
<td>Like “<em>ser</em>”</td>
<td>“ser”, “serial”, “loser”, “reserves”, “alternative service”, …</td>
</tr>
</tbody>
</table>
Use comparison and Boolean operators to apply multiple criteria:

<table>
<thead>
<tr>
<th>Expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; “5” And &lt; “8”</td>
</tr>
<tr>
<td>&lt; 0 Or &gt; 100</td>
</tr>
<tr>
<td>Like “main*” And Not “main refe”</td>
</tr>
<tr>
<td>&gt;= #1/1/2006# And &lt; #1/2/2006#</td>
</tr>
<tr>
<td>Between “5” And “8”</td>
</tr>
<tr>
<td>“Missing” Or “Lost—System Applied” Or “Lost—Library Applied”</td>
</tr>
<tr>
<td>“Missing” Or Like “Lost*”</td>
</tr>
<tr>
<td>“main” Or “sci” Or “agri”</td>
</tr>
<tr>
<td>In(“main”, “sci”, “agri”)</td>
</tr>
</tbody>
</table>
USING DATES AS CRITERIA

Date constants
Use hashes/number signs: #2/1/2006#
Affected by “Regional Settings”
Defaults to current year: #2/1#
Year alone is not enough: #2006#

Date/time problem
All Date/Time values include a time --
#2/1/2006# equals midnight at the
beginning of the day, 2/1/2006

Ranges
Between #7/27/2006# And #7/28/2006#
Between #7/27/2006# And #7/27/2006 23:59:59#
DON’T BE A LOSER!

Once a query has started, you have to wait for it to end or use the Task Manager to “End Task”, which will lose work in progress.

SAVE QUERIES BEFORE RUNNING THEM!
The message: “user requested cancel…” indicates query timeout. Change the “ODBC Timeout” property to 0 to eliminate timeouts or to another value (in seconds).
DISABLING TIMEOUTS

With the Oracle 8 ODBC drivers, you can turn off query timeout altogether. You can’t do this with the Microsoft Oracle 9 drivers, but it doesn’t seem to be a problem for me so far.

Once you have installed them, go to the ODBC Control Panel and configure the connection.
LET'S GIVE IT A TRY!

EXERCISES

ACCESS

QUERY
An expression, or calculated field, takes the values of one or more fields and uses them to create new values.

Example expressions:
- $X + Y$
- $\text{ROUND}(N)$
- $\text{UCASE}($NAME$)$
- $\sqrt{W}$
- $\text{ABS}($Allocation-Expenditure$)$
- $I - (K \times L)$
Wherever you can use a field, you can use an expression.

If you don’t choose a field name, it will be “Expr1”
SOME USEFUL FUNCTIONS

UCase  Convert to upper case  UCase(CITY)
    UCase(“Navasota, Tex.”) = “NAVASOTA, TEX.”
LCase  Convert to lower case  LCase(CITY)
    LCase(“College Station, Tex.”) = “college station, tex.”
Left   Left part of text     Left(CALLNUM,3)
    Left(“004.12 A324d”,3) = “004”
Right  Right part of text   Right(CALLNUM,3)
    Right(“004.12 A324d”,3) = “24d”
Mid    Part of text         Mid(CALLNUM,5,4)
    Mid(“004.12 A324d”,5,4) = “12 A”
Mid    Remainder of text    Mid(CALLNUM,5)
    Mid(“004.12 A324d”,5) = “12 A324d”
Date   Current date         Date()
    Date() = #7/27/2006#
CCur   Convert to currency  CCur(AMOUNT)
    CCur(53.9) = $53.90
The best way to get information about the functions available in Access is to open the Table of Contents and go to the “Microsoft Visual Basic Documentation” section. Under that, you can find the functions available, and how to use them.
NORMAL_ISSN: Mid([BIB_TEXT].[ISSN],1,4) & Mid([BIB_TEXT].[ISSN],6,4)

COMMENTS: CCur([COMMITMENTS]/100)
NUMERIC FIELDS IN ACCESS

Access does not recognize numbers--all fields are Text or Date/Time.
Multiplication, subtraction, division, and functions like Sum work, anyway, but addition doesn’t.

```sql
USAGE: Val([HISTORICAL_CHARGES]) + Val([historical_browses])
```

Wrong: `HISTORICAL_CHARGES + HISTORICAL_BROWSES`

Text to Number: `Val(HISTORICAL_CHARGES)`
MONETARY VALUES

Monetary values problems:

✓ Converted to text
✓ Integers, stored in the smallest unit

To include a monetary figure in a query:

\[ CCur([AMOUNT]/100) \]
You can sort query results by one or more fields. Fields will be considered in order from left to right.
MULTIPLE CRITERIA

For complex multiple criteria, you can use additional criteria lines (first one is labeled “or:”)
PROMPTING FOR CRITERIA

SYNTAX:
Left square bracket – Prompt – Right square bracket
Example: [Bib ID Number?]
Make your prompts the best they can be. Imagine that the users do not know what kind of information is expected. Provide enough information in the prompt that they can figure it out.

- [p1]
- [sdate]
- [start]  *Endeavor’s standard*
- [start date]
- [Start Date:]
- [First date of data:]
- [Starting date for report (mm/dd/yyyy):]
MORE COMPLEX PROMPTS

<> [Item Type to Exclude?]
> [Minimum Price?]
Like [Generic Location Code:] & “*”
Not Like [Vendor to Skip] & “*”
Between [Start Date:] And [End Date:]

If you use the same exact prompt more than once, it only prompts you once and substitutes the same value in each spot.
THE Format FUNCTION

Format(expression, "format")

Format(MyDate, "mmm d yyyy")    "Jan 27 1993"
Format(MyDate, "yyyyymmdd")      "19930127"
Format(MyTime, "h:m:s")          "17:4:23"
Format(MyTime, "hh:mm:ss AMPM")  "05:04:23 PM"
Format(23)                         "23" (as text)
Format(5459.4, "##,##0.00")      "5,459.40"
Format(7334.9, "###0.00")        "7334.90"
Format("HELLO", "<")             "hello"
Format("This is it", ">")        "THIS IS IT"

Format() allows you to print and display dates and other values in whatever manner you like or need for a given query.
THE DateAdd FUNCTION

DateAdd(interval, number, date)
ADD “number” TIMES THE “interval” TO THE “date”

EXAMPLES:

ONE YEAR AGO TODAY:
DateAdd(“yyyy”, -1, Date())

ONE MONTH’S WORTH:
Between [Start of Month] And
DateAdd(“m”, 1, [Start of Month])

OVER THE WEEKEND:
Between [Friday’s Date?] And
DateAdd(“d”, 3, [Friday’s Date?])

ARBITRARY PERIOD’S DATA (SAFELY):
Between [Start Date:] And DateAdd(“s”, -1, [End Date:])

“yyyy” — YEAR
“q” — QUARTER
“m” — MONTH
“d” — DAY
“ww” — WEEK
“s” — SECOND
There is a difference between fields that have no value and fields that have an “empty” value, but it’s hard to know which will be which.

Number with zero value:
0 <> 0

Text with “empty” value:
“” <> “”

Value: Never had one, never will:
Is Null Is Not Null

So, to be safe:
Is Null Or “” Is Not Null And <> “”
ENOUGH TALK!

ACCESS
QUERY
EXERCISES 2
SOME TOOLS YOU’LL NEED

Client programs
ER Diagrams and
Data Dictionary
Tables

*These three tools are the primary ones used in the CERTA-Query System, presented at VUGM 2002: (Session 9 – “Buried Treasure: Finding Reporting Gold in the Voyager Tables”)
Lots of info
Easy to see
ENTITY-RELATIONSHIP DIAGRAMS

must have one and only one
one or many

zero or one
zero, one or many

more
ENTITY-RELATIONSHIP DIAGRAMS

WHAT THEY SHOW:
Names of all the fields in a table
Which tables are linked
Exact relationships between tables
Relationships for a topic area

FOUR PROBLEMS:
Don’t include all tables
Not indexed
Don’t tell what each field is for
Don’t show linking fields
ENTITY-RELATIONSHIP DIAGRAMS

WHAT THEY SHOW:
Names of all the fields in a table
Which tables are linked
Exact relationships between tables
Relationships for a topic area

FOUR PROBLEMS:
Don’t show linking fields
Don’t tell what each field is for
Not indexed
Don’t include all tables
E-R DIAGRAMS (Voyager 6.1)

- Bindery maintenance
- Call Slip
- Character set mapping
- Circulation alerts
- Circulation transaction archive
- Circulation transactions
- Circulation transactions – short version
- Course reserves
- Distribution items
- Headings, authorities, and bibliographic records
- Holds and Recalls
- In transit item tracking
- Ledgers and funds
- Left-anchored indexes
- Media scheduling
- Media scheduling inventory
- Order/Receive problem & claim lists
- Owning library, location, bibliographic holdings and item record relationships
- Patron Fines and Fees
- Patrons
- Proxy patrons
- Purchase order & invoice
- Security – cataloging profiles
- Security – circulation profiles
- Serials check-in & claims
- Serials routing
- Shelflist
- Short loans
- UB patron data
- UB request
Endeavor also provides a “Data Dictionary”, which lists all of the fields you can find in each table. It is sometimes easier to scan this document to find links than it is to scan the E-R Diagrams.
CONTENTS OF TABLES

Easiest way to see what kind of data is in any given table
VOYAGER TABLE ROADMAP

Circulation

Acquisitions

OPAC

Media Scheduling

SysAdmin

Citation Server

UB

Cataloging

KEY: VOYAGER TABLE
RELATIONSHIPS ARE COMPLEX
CORE RELATIONSHIPS

- BIB_TEXT
- BIB_MFHD
- MFHD_MASTER
- MFHD_ITEM
- ITEM
CIRCULATION RELATIONSHIPS

How much data do you want?
GETTING ALL THE CIRCULATION HISTORY

There is a record in CIRC_TRANSACTIONS for each item that is currently checked out.

There is a record in CIRC_TRANS_ARCHIVE for each item that used to be checked out, but has been returned.

To get all the transactions for any given period, you need data from both tables. There are two similar tables for renewal data.
UNION QUERIES

Joins imply a “horizontal” relationship between two tables. That doesn’t describe the circulation transactions. These tables have more of a “vertical” relationship. To make them into a single table, use a UNION ALL Query.

The two tables (or the fields you select from them) must have the exact same fields.
We’d like to be able to create two queries in Design View, then just attach them together as in the example above. But UNION queries are “SQL Specific”, so they must be written in SQL.
UNION QUERIES

Here are those same two queries, but expressed in SQL with UNION ALL.

If you are comfortable using SQL, this is not a problem. But what if you don’t know and don’t want to know any SQL?
The asterisk operator, which stands for “All fields from the table”, makes it easy to create a Union All from two Design View queries.

In general, the syntax is:
SELECT * FROM [<query 1>]
UNION ALL
SELECT * FROM [<query 2>]
UNION ALL
SELECT * FROM [<query 3>];
CIRCCHARGES_VW
CIRCCHARGES_VW performs the UNION between CIRC_TRANSACTIONS and CIRC_TRANS_ARCHIVE (and more!).

<table>
<thead>
<tr>
<th>P</th>
<th>PATROL</th>
<th>ITEM</th>
<th>MFHD</th>
<th>BIB</th>
<th>GOV_L</th>
<th>GOV_ITEM</th>
<th>CHARGE_DATE_TIME</th>
<th>CHARGE_D</th>
<th>CHARGE_T</th>
<th>CHARGE_E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Faculty</td>
<td>169</td>
<td>156</td>
<td>151</td>
<td>stacks</td>
<td>monograph</td>
<td>1/31/1995 4:48:00 PM</td>
<td>1/31/1995</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Faculty</td>
<td>318</td>
<td>305</td>
<td>298</td>
<td>stacks</td>
<td>monograph</td>
<td>11/29/1999 5:36:29 PM</td>
<td>11/29/1999</td>
<td>Circ Desk</td>
<td>Circ Dept</td>
</tr>
<tr>
<td>1</td>
<td>Faculty</td>
<td>480</td>
<td>467</td>
<td>454</td>
<td>stacks</td>
<td>monograph</td>
<td>7/16/1999 11:07:11 AM</td>
<td>7/16/1999</td>
<td>Circ Desk</td>
<td>Circ Dept</td>
</tr>
<tr>
<td>1</td>
<td>Faculty</td>
<td>587</td>
<td>573</td>
<td>557</td>
<td>stacks</td>
<td>monograph</td>
<td>7/9/1999 4:20:41 AM</td>
<td>7/9/1999</td>
<td>Circ Desk</td>
<td>Circ Dept</td>
</tr>
<tr>
<td>1</td>
<td>Faculty</td>
<td>739</td>
<td>718</td>
<td>693</td>
<td>stacks</td>
<td>monograph</td>
<td>4/21/2001 4:37:35 PM</td>
<td>4/21/2001</td>
<td>Circ Desk</td>
<td>Circ Dept</td>
</tr>
<tr>
<td>1</td>
<td>Faculty</td>
<td>739</td>
<td>718</td>
<td>693</td>
<td>stacks</td>
<td>monograph</td>
<td>4/21/2001 4:37:35 PM</td>
<td>4/21/2001</td>
<td>Circ Desk</td>
<td>Circ Dept</td>
</tr>
<tr>
<td>1</td>
<td>Faculty</td>
<td>868</td>
<td>861</td>
<td>829</td>
<td>terc</td>
<td>terc</td>
<td>2/18/2000 3:19:20 PM</td>
<td>2/18/2000</td>
<td>Circ Desk</td>
<td>Circ Dept</td>
</tr>
<tr>
<td>1</td>
<td>Faculty</td>
<td>1036</td>
<td>1006</td>
<td>963</td>
<td>stacks</td>
<td>monograph</td>
<td>7/16/1999 11:07:16 AM</td>
<td>7/16/1999</td>
<td>Circ Desk</td>
<td>Circ Dept</td>
</tr>
<tr>
<td>1</td>
<td>Faculty</td>
<td>1064</td>
<td>1032</td>
<td>989</td>
<td>stacks</td>
<td>monograph</td>
<td>12/21/1999 4:45:05 PM</td>
<td>12/21/1999</td>
<td>Circ Desk</td>
<td>Circ Dept</td>
</tr>
<tr>
<td>1</td>
<td>Faculty</td>
<td>1099</td>
<td>1067</td>
<td>1022</td>
<td>stacks</td>
<td>monograph</td>
<td>6/18/2001 5:01:16 PM</td>
<td>6/18/2001</td>
<td>Circ Desk</td>
<td>Circ Dept</td>
</tr>
<tr>
<td>1</td>
<td>Faculty</td>
<td>1189</td>
<td>1127</td>
<td>1082</td>
<td>ref ser</td>
<td>reference</td>
<td>2/13/1999 10:35:05 PM</td>
<td>12/13/1999</td>
<td>Circ Desk</td>
<td>Circ Dept</td>
</tr>
</tbody>
</table>
THE WHOLE NINE YARDS

On my Advanced Reporting Techniques (ART) workshop website, I have the SQL for a UNION of all circulation transaction information that you can copy and customize:

http://www.mashiyyat.net/art/allcircdata.txt

```sql
SELECT
  CHARGE_LOCATION AS LOCATION_ID,
  CHARGE_DATE AS TRANS_DATE,
  ITEM.ITEM_ID,
  PATRON_GROUP_ID,
  ITEM_TYPE_ID,
  'C' AS TRANS_TYPE
FROM
  CIRC_TRANSACTIONS
INNER JOIN
  ITEM
  ON CIRC_TRANSACTIONS.ITEM_ID = ITEM.ITEM_ID
UNION ALL
SELECT
  RENEW_LOCATION AS LOCATION_ID,
  RENEW_DATE AS TRANS_DATE,
  ITEM.ITEM_ID,
  PATRON_GROUP_ID,
  ITEM_TYPE_ID,
  'R' AS TRANS_TYPE
FROM
  RENEW_TRANSACTIONS
INNER JOIN
  CIRC_TRANSACTIONS
  ON RENEW_TRANSACTIONS.CIRC_TRANSACTION_ID = CIRC_TRANSACTIONS.CIRC_TRANSACTION_ID
INNER JOIN
```
Relationships for Acquisitions tables are very complex—more than would fit on a few slides.

We need to use what we know, e.g.:

- Funds are in a hierarchy under a ledger
- Purchase orders go to a single vendor
- Bib information goes on a line item
- Payments are made on invoices
- Each line item can use a different fund or even several funds
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LINE_ITEM_FUNDS</td>
<td>Funds assigned to PO line items in “Copies/Funds” box (amounts in foreign currency)</td>
</tr>
<tr>
<td>PO_FUNDS</td>
<td>Funds assigned to PO line items, plus funds for PO adjustments until invoice is approved (base currency)</td>
</tr>
<tr>
<td>LINE_ITEM_COPY</td>
<td>Funds assigned to line item copies on the PO (no amounts)</td>
</tr>
<tr>
<td>FUND_PAYMENT</td>
<td>Funds used for prepayments and invoice adjustments (foreign)</td>
</tr>
<tr>
<td>INVOICE_LINE_ITEM_FUNDS</td>
<td>Funds assigned or used for invoice line items (foreign)</td>
</tr>
<tr>
<td>INVOICE_FUNDS</td>
<td>Funds assigned or used for invoice line items, plus funds for invoice adjustments, after approval (base)</td>
</tr>
</tbody>
</table>
Funds in Voyager

Fund IDs are unique...

...only within a fiscal year

Always link fund tables by both Fund_ID and Ledger_ID
WHAT A DIFFERENCE A LINE MAKES!

This little line is all there is to show the fund hierarchy found in the Acquisitions client.
TABLE BASICS: ACQUISITIONS

Each fund has a parent or “lives” directly under the ledger.

- LEDGER_ID = 29
- FUND_ID = 28, PARENT_FUND = 0
- FUND_ID = 31, PARENT_FUND = 28
- FUND_ID = 32, PARENT_FUND = 31
PURCHASE ORDER LINKS

- **PO_STATUS**
- **PO_NOTES**
- **PO_TYPE**
- **PURCHASE_ORDER**
- **LINE_ITEM_COPY**
- **LINE_ITEM_COPY_STATUS**
- **LINE_ITEM_FUNDS**
- **BIB TABLES**
- **INVOICES**

- **LEDGER_ID**
- **FUND_ID**
- **FUND**
- **LINE_ITEM_ID**
- **COPY_ID**
- **LINE_ITEM_ID**
- **LINE_ITEM_ID**
- **PO_ID**
- **PO_ID**
- **PO_ID**
CURRENCY CONVERSION

Base currency: \( CCur([AMT]/100) \)

Foreign currencies: \( CCur( ([LINE_PRICE] / ([CONVERSION_RATE] / 100000)) / 100) \)

This is the conversion rate actually used.
CATALOGING STATISTICS

You may want statistics on records cataloged by operator, location or call number. The key to all of these is determining when an item was cataloged. This depends on your workflow.

For bibs and MFHDs, you want to find the create or modify date with a query that has something like this. For releases prior to the Unicode release, use this instead
VOYAGER LOCATIONS

There are three locations in Voyager. You can pretty much ignore the MFHD.
CIRCULATION LOCATIONS

Does item have Temporary Location?

YES

Set “Governing Location” to Temp Location

NO

Set “Governing Location” to Perm Location

Get circulation policy group for “Governing Location”

Read item barcode

Find item record for this barcode

Circulation always uses item temp location if present or perm location if not.
WebVoyage displays the MFHD location for some odd situations, but usually displays the item locations. Limiting by location uses the MFHD location.
EXPLORE ON YOUR OWN

VOYAGER EXPLORATION EXERCISES
TOO MANY RESULTS

Unwanted records usually come from one of two conditions. The first is incorrect joins:
TOO MANY RESULTS

The other source is from joining two tables where duplicates might be expected, but not saving the distinct fields:
TOO MANY RESULTS

To fix the second problem, change the “Unique Values” property from “No” to “Yes”.

![Query Properties window showing the unique values setting changed from No to Yes.](image)
TOO FEW RESULTS

Having results turn up missing stems from two main conditions. The first is a bad join:

---

<table>
<thead>
<tr>
<th>Field</th>
<th>Table</th>
<th>Sort:</th>
<th>Show:</th>
<th>Criteria:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISPLAY_CALL_NO</td>
<td>MFHD_MASTER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITEM_ENUM</td>
<td>MFHD_ITEM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHRON</td>
<td>MFHD_ITEM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YEAR</td>
<td>MFHD_ITEM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOCATION_CODE</td>
<td>LOCATION</td>
<td></td>
<td></td>
<td>Like &quot;bcc&quot;</td>
</tr>
</tbody>
</table>

---

![Bad Join example: Select Query](image)
TOO FEW RESULTS

The second cause is joining tables where values may be missing:
TOO FEW RESULTS
The problem is with this join. Get the Join Properties.
TOO FEW RESULTS
Read carefully and choose the option that gets you what you want.

1: Only include rows where the joined fields from both tables are equal.

2: Include ALL records from 'VENDOR' and only those records from 'VENDOR_NOTE' where the joined fields are equal.

3: Include ALL records from 'VENDOR_NOTE' and only those records from 'VENDOR' where the joined fields are equal.
TOO FEW RESULTS
The join line changes from “point to point” to “point to arrow”.

![Vendor addresses and notes: Select Query diagram](image-url)
A common request is to find bib records with no MFHDs and MFHDs with no items. You need to do an OUTER JOIN and look for Null values.
AGGREGATING DATA

<table>
<thead>
<tr>
<th>LEDGER</th>
<th>AMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>$62.50</td>
</tr>
<tr>
<td>Agriculture</td>
<td>$122.04</td>
</tr>
<tr>
<td>Agriculture</td>
<td>$13.44</td>
</tr>
<tr>
<td>Agriculture</td>
<td>$88.85</td>
</tr>
<tr>
<td>Agriculture</td>
<td>$233.31</td>
</tr>
<tr>
<td>Agriculture</td>
<td>$78.54</td>
</tr>
<tr>
<td>Agriculture</td>
<td>$834.56</td>
</tr>
<tr>
<td>Agriculture</td>
<td>$92.42</td>
</tr>
<tr>
<td>Agriculture</td>
<td>$43.45</td>
</tr>
<tr>
<td>Biology</td>
<td>$34.22</td>
</tr>
<tr>
<td>Biology</td>
<td>$23.69</td>
</tr>
<tr>
<td>Biology</td>
<td>$54.64</td>
</tr>
<tr>
<td>Biology</td>
<td>$100.32</td>
</tr>
<tr>
<td>Biology</td>
<td>$103.54</td>
</tr>
<tr>
<td>Biology</td>
<td>$75.25</td>
</tr>
</tbody>
</table>

Agriculture
- SUM = $1,569.11
- AVG = $174.35
- MIN = $13.44
- MAX = $834.56
- COUNT = 9
- STDEV = 255.154231108907
- VAR = 65103.6816527778
- FIRST = $62.50
- LAST = $43.45

Biology
- SUM = $391.66
- AVG = $65.28
- MIN = $23.69
- MAX = $103.54
- COUNT = 6, etc.
AGGREGATE FUNCTIONS

Click the sigma (Σ) to get a “Total” line.
AGGREGATE FUNCTIONS: GROUP BY

Wherever the values are equal, collapse into a single record. If you group by multiple fields, they collapse only where all are equal.
AGGREGATE FUNCTIONS:
THE FUNCTIONS

Wherever the “Group By” fields are equal, perform the selected operation on the fields and substitute the results.
You must either “Group By” or aggregate every field that you want to include in your results. If a field is on the “Field” line only because you want to apply criteria to it, you can use “Where”.
TABLE:
A collection of data, organized into rows and named columns

QUERY RESULTS:
A collection of data, organized into rows and named columns

IMPLICATION:
Wherever you can use a table, you can use a query instead
Create a new query and choose from the “Queries” tab, instead of the “Tables” tab.
SUBQUERIES

Titles of books checked out to patrons that have more than 10 overdue books:
SUBQUERIES

CAN BE USED:

- To simplify query logic
- To isolate repeated tasks
- To allow design view with SQL-specific parts
  e.g. Subquery to get raw circ stats

MUST BE USED:

- When you want to group and extract the same data
  e.g. Amounts paid to vendors to which we have paid more than $1000 this year
ARE YOU READY TO TRY IT?

ACCESS

QUERY

EXERCISES

3
PREPACKAGED QUERIES

c:\Voyager\Access Reports\reports.mdb
PREPACKAGED QUERIES

An example query

Is this exactly what you want?
A count of items charged by Dewey class number within a specified date range. CIRCCCHARGES_VW counts only charges, not renewals. DEWEYCLASS_VW includes only Dewey items, not all.
SHARING ACCESS OBJECTS

Highlight, Edit->Copy, Highlight, Edit->Paste, Name
IMPORTING OBJECTS

Importing is often faster and easier
IMPORTING OBJECTS
Find the database you want to “steal” from, highlight all the objects you want, and click OK to import them.
MOVING TO A NEW RELEASE

BASIC STEPS:

1. Copy the new database, “c:\voyager\access reports\reports.mdb” to a work folder.
2. Link the tables in the new reports.mdb database.
3. Copy this reports.mdb somewhere for safekeeping.
4. Import your old queries into the new database.
5. Check the release notes for any schema changes that may affect your queries.

More details in a resource sharing record on SupportWeb: “How to migrate Access queries for a new Voyager release”
SHARING QUERIES WITH OTHERS, OUTBOUND SQL View
SHARING QUERIES WITH OTHERS, OUTBOUND

SQL View Copy Paste into e-mail
SHARING QUERIES WITH OTHERS, INBOUND
SHARING QUERIES WITH OTHERS, INBOUND
SHARING QUERIES WITH OTHERS, INBOUND
SHARING QUERIES WITH OTHERS, INBOUND
SHARING QUERIES WITH OTHERS, INBOUND

SELECT DISTINCT BIB_TEXT.AUTHOR,
BIB_TEXT.TITLE,
MFHD_MASTER.DISPLAY_CALL_NO
FROM MFHD_MASTER INNER JOIN
(BIB_TEXT INNER JOIN BIB_MFHD ON
BIB_TEXT.BIB_ID = BIB_MFHD.BIB_ID) ON
MFHD_MASTER.MFHD_ID =
BIB_MFHD.MFHD_ID
WHERE
((Mid([BIB_TEXT].[FIELD_008],32,1))="1")
AND
((MFHD_MASTER.NORMALIZED_CALL_NO)
Like "305.42");
SHARING QUERIES WITH OTHERS, INBOUND
PLAY NICE
ACCESS
OBJECT
SHARING
EXERCISES
REPORTS
Format results of queries or contents of tables

<table>
<thead>
<tr>
<th>BALANCE</th>
<th>FUND_ID</th>
<th>LEDGER_NAME</th>
<th>TOLEVEL_NAME</th>
<th>MIDLEVEL</th>
<th>ALLOCATION</th>
<th>COMMITMENTS</th>
<th>EXPENDITURES</th>
<th>BALANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5575.16</td>
<td>68</td>
<td>Cons Fam Sci</td>
<td>Monograph Summar School Lit</td>
<td></td>
<td>$45,838.25</td>
<td>$18,197.12</td>
<td>$9,349.41</td>
<td>$18,291.72</td>
</tr>
<tr>
<td>-5614.14</td>
<td>69</td>
<td>Cons Fam Sci</td>
<td>Monograph Summar School Lit</td>
<td></td>
<td>$45,838.25</td>
<td>$18,197.12</td>
<td>$9,349.41</td>
<td>$18,291.72</td>
</tr>
<tr>
<td>-7062.91</td>
<td>90</td>
<td>Cons Fam Sci</td>
<td>Monograph Summar School Lit</td>
<td></td>
<td>$45,838.25</td>
<td>$18,197.12</td>
<td>$9,349.41</td>
<td>$18,291.72</td>
</tr>
<tr>
<td>1567.43</td>
<td></td>
<td>Cons Fam Sci</td>
<td>New Serial Summar School Lit</td>
<td></td>
<td>$0.00</td>
<td>$3,709.69</td>
<td>$2,679.00</td>
<td>(6,368.69)</td>
</tr>
<tr>
<td>1567.45</td>
<td></td>
<td>Cons Fam Sci</td>
<td>New Serial Summar School Lit</td>
<td></td>
<td>$0.00</td>
<td>$3,709.69</td>
<td>$2,679.00</td>
<td>(6,368.69)</td>
</tr>
<tr>
<td>75.73</td>
<td>14</td>
<td>School Libran Mono</td>
<td>Child Dev Fam Mono</td>
<td></td>
<td>$0.00</td>
<td>$3,709.69</td>
<td>$2,679.00</td>
<td>(6,368.69)</td>
</tr>
<tr>
<td>75.73</td>
<td>14</td>
<td>School Libran Mono</td>
<td>Cons Family Sci Mono</td>
<td></td>
<td>$0.00</td>
<td>$3,709.69</td>
<td>$2,679.00</td>
<td>(6,368.69)</td>
</tr>
<tr>
<td>8549.18</td>
<td>14</td>
<td>School Libran Mono</td>
<td>Cons Retailing Mono</td>
<td></td>
<td>$0.00</td>
<td>$3,709.69</td>
<td>$2,679.00</td>
<td>(6,368.69)</td>
</tr>
<tr>
<td>8549.18</td>
<td>14</td>
<td>School Libran Mono</td>
<td>Foods Nutrition Mono</td>
<td></td>
<td>$0.00</td>
<td>$3,709.69</td>
<td>$2,679.00</td>
<td>(6,368.69)</td>
</tr>
<tr>
<td>7873.39</td>
<td>15</td>
<td>School Libran Mono</td>
<td>Restaurant Mono</td>
<td></td>
<td>$0.00</td>
<td>$3,709.69</td>
<td>$2,679.00</td>
<td>(6,368.69)</td>
</tr>
<tr>
<td>740.8600</td>
<td>15</td>
<td>Monograph Summar</td>
<td>New Serial Summar School Lit</td>
<td></td>
<td>$1,567.40</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$1,567.40</td>
</tr>
<tr>
<td>740.8600</td>
<td>15</td>
<td>School Libran Ser</td>
<td>Cons Family Sci Ser</td>
<td></td>
<td>$1,567.40</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$1,567.40</td>
</tr>
</tbody>
</table>

Deans Fund

Gift Summary

| [total] | $1,369.74 | $0.00 | $0.00 | $1,369.74 |

Deans Fund Gift

Monograph Summary

| [total] | $165,838.68 | $50.00 | $14,449.84 | $151,338.84 |
CREATING A REPORT

Use the Report Wizard at first

Choose the query you want to use

Choose the fields you want then specify Grouping, Sorting, Layout, & Style then modify it

Choose the query you want to use
REPORT DESIGN VIEW
Run Query
Report Header
Page Header
[Other Headers]
Detail (repeat until…)
☟ New group value: Group Header
☟ End of page: Page Footer
☟ End of data: Report Footer, final Page Footer
### Security: All Profiles and Operators

<table>
<thead>
<tr>
<th>Name</th>
<th>Acquisitions</th>
<th>Cataloging</th>
<th>Circulation</th>
<th>Media Scheduling</th>
<th>SysAdmin</th>
<th>Other Administrator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandernack, Scott (stm)</td>
<td>View Only</td>
<td>VIEWONLY</td>
<td>UGRL LEVEL 3</td>
<td>Full Access</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manifold, Alan (manifold)</td>
<td>Full Access</td>
<td>GLOBAL</td>
<td>Full Access</td>
<td>Full Access</td>
<td></td>
<td>Other Administrator</td>
</tr>
<tr>
<td>Markee, Katherine (markee)</td>
<td>View Only</td>
<td>VIEWONLY</td>
<td>Restricted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Martin, Brenda (bmartin)</td>
<td>TechSerialOrderReceive</td>
<td>CATALOG &amp; MAINTENANCE</td>
<td>Restricted</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHANGING REPORT DESIGN

- Change label text
- Resize controls
- Change fonts
- Move controls
- Resize areas
- Remove areas
- Change Page Setup
- Add/Remove controls

[Diagram showing a media schedule report with fields for PATRON_GROUP_DISPLAY, BOOKING_START, MFHD_ID, and MEDTYPE]
CHANGING REPORT DESIGN

- Change label text
- Resize controls
- Change fonts
- Move controls
- Resize areas
- Remove areas
- Change Page Setup
- Add/Remove controls
In a report with a Group Footer (or Header), you can add calculated fields that give the “Sum” (or “Count”, “Avg”, “Max”, “Min”, etc.) of the records in the group.
MAKE TABLE QUERIES

What it does:
select data and store the results in an Access table.

Results are not displayed on the screen, but are saved once the query is run and closed.
MAKE TABLE QUERIES

Change a query into a Make Table Query and base your report on the table instead of the query. Your report will run faster. Once you are finished testing, you can base it on the query again.
LET’S TRY A REPORT!

REPORT
CHANGING DEMO & EXERCISES
REPORTER AT A GLANCE

- Input into Voyager applications
- Stored in fields in Oracle tables
- Extracted by batch jobs to text files
- Pulled by Reporter onto workstation
- Stuffed into Access tables
- Inserted into Access reports
- Archived on workstation
If you’ve seen one Access database, you’ve seen them all.
MODIFYING REPORTER OUTPUT

✓ Move fields around
MODIFYING REPORTER OUTPUT

✓ Change appearance / format of fields

New Font
Italics
Date Format
MODIFYING REPORTER OUTPUT

✓ Add labels, pictures, etc.
MODIFYING REPORTER OUTPUT

✓ Change Page Setup options

LANDSCAPE

PORTRAIT
MODIFYING REPORTER OUTPUT

¡ADD NEW INFORMATION!

Contact me if you want to do this at your site.
The final section of the workshop covers extracting information from the “BLOB”, or full MARC record. The BLOB section is for advanced users, and involves heavy use of expressions. If you aren’t sure you’ll want to use this, you might want to leave now.

GetSubField(GetFieldRaw(GetBibBlob(BIB_ID),“020”,1),“”,1)

If you decide to leave, please fill out an evaluation form before you go, so the workshop can continue to improve.
MARC records: few common fields, many optional/repeatable fields
Imagine how long it would take to display the maximum of 10,000 records!
A COMPROMISE

To solve the problem that putting MARC records in “proper design” would cause, Endeavor compromised. They store bib, MFHD and authority records in full MARC format but also break out a number of fields into other tables.

OCLC MARC Record in Raw Form:
00734cam 22002411 45*000100130000003000600 01300500170001900800410003601000170007704000 2300940430012001170500016001290820013001450 920019001580490090090177100002500186245009800 2112600057003093000039003663500009004050400 3000414651004800444*ocm00442080*OCoLC*1994 0620065418.0*701012s1968    pauab b 000 0 eng * ‡a 68021623 * ‡aDLC‡cDLC‡dOCL‡dIPL*†an-us---*0 ‡aJ2K556‡b.E2* ‡a325.3/73* ‡a325.373‡bEb61f* ‡aIPL1*1 ‡aEblen, Jack Ericson.*14‡aThe first and second United States empires; governors and territorial government, 1784-1912.*†a[University of Pittsburgh‡bUniversity of Pittsburgh Press‡c1968]* ‡aviii, 344 p.§billus.,ma p.‡c24 cm.* ‡a8.95* ‡aBibliography: p. 321-333.* 0‡aUnited States‡xTerritories and possessions.*
BIB_TEXT

BIB_TEXT is the “Mother of all Tables” in Voyager. Learn its major fields by heart.
BIB_INDEX is incredibly useful. It has records for all left-anchored searches, including subject headings, added authors and others that are not in BIB_TEXT.
THE BLOBS
Full MARC records are stored in “BLOBs” (or “Binary Large OBjects”). There are three tables that contain them: BIB_DATA, MFHD_DATA and AUTH_DATA.

The records can’t be used in this form...
BLOB VIEWS

Voyager 2000 introduced three BLOB views that were supposed to make using the BLOB easier, but they don’t work.
BLOB VIEW BUG

When the BLOB views encounter records of more than 4000 bytes, they produce an error message and fail.
• Extract a MARC record identified by BIB_ID, MFHD_ID or AUTH_ID
  
  GetBibBLOB(BIB_ID)
  GetMFHDBLOB(MFHD_ID)
  GetAuthBLOB(AUTH_ID)

• Extract one or more fields from that MARC record
  
  GetField(*MARC Record*, “300”, 1)
  GetFieldRaw(*MARC Record*, “300”, 1)
  GetFieldAll(*MARC Record*, “300”)

• Extract a subfield from that field
  
  GetSubField(*MARC Field*, “c”, 1)
USING THE FUNCTIONS TOGETHER

We can go the long way or take the shortcut. The long way involves three queries, two used as subqueries:

1. Get Bib BLOB: Select Query
   - BIB_ID
   - AUTHOR
   - TITLE
   - TITLE_BRIEF

2. Get Field Raw (300-1): Select Query
   - MARC_RECORD

3. Get Field Raw: Select Query
   - Field300

4. Get Subfield 300c: Select Query
   - Subfield300c: GetSubField([Field300], "c", 1)
SYNTAX SHORTCUT

The shortcut is to imbed the calls to “larger” functions into the “smaller” functions:

```
GetSubField(GetFieldRaw(GetBibBLOB(BIB_ID), "300", 1), "c", 1)
```

```
GetSubField(
    GetFieldRaw(
        GetBibBLOB(BIB_ID),
        "300",
        1),
    "c",
    1)
```
BLOB RETRIEVAL FUNCTIONS

To retrieve the BLOBs, use Get*BLOB functions:

GetBibBLOB("90210")

- Gets bib BLOB where BIB_ID = "90210"

GetBibBLOB(BIB_ID)

- Gets bib BLOBs for all records in whatever table BIB_ID comes from in your query

GetBibBLOB(BIB_TEXT.BIB_ID)

- Gets bib BLOBs for all records in BIB_TEXT

Also:

GetMFHDBLOB(MFHD_ID)

GetAuthBLOB(AUTH_ID)
BLOB PARSING FUNCTIONS

Read these functions backwards:

Get the first 650 field from the BLOB for BIB_ID

GetFieldRaw(GetBibBlob(BIB_ID), “650”, 1)
650 0‡aMormon Church‡xRelations‡xJudaism.

GetField(GetBibBlob(BIB_ID), “650”, 1)
Mormon Church Relations Judaism.

GetFieldAll(GetBibBlob(BIB_ID), “650”)
Mormon Church Relations Judaism.
Judaism Relations Mormon Church.
Mormon Church Doctrines.
Jews Restoration.

GetSubField(GetFieldRaw(GetBibBlob(BIB_ID), “650”, 1), “x”, 2)
Judaism.
The second parameters can be truncated to do generic matching. For example, to get any “1XX” Field, you can use just “1”. For the DTag field, or you can use an empty string (“”) to match any subfield:

GetField(GetAuthBlob(AUTH_ID), “1”, 1)

GetSubField(GetFieldRaw(GetBibBlob(BIB_ID), “020”, 1), “”, 1)
AN EXAMPLE BLOB QUERY

Use the BLOB functions in the “Field” line of a query
Get title, call number and all 5xx (note) fields from bib records
<table>
<thead>
<tr>
<th>TITLE</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease, the individual, and society; social-psychological aspects of disease; a summary and analysis of a decade of research, by Gerald Gordon [and others].</td>
<td>Summarizes 248 research projects listed in the 1953-60 issues of An inventory of social and economic research in health. Includes bibliographical references and indexes.</td>
</tr>
</tbody>
</table>

Make the row taller or use a Report text box with the “Can Grow” property set to “Yes” to see all fields.
GetSubField must be used in combination with GetFieldRaw. Both of these functions require you to specify “Which” matching field/subfield you want.
LET’S BATTLE THE BLOB!

BLOB

EXERCISES
IF YOU GET STUCK

Alan Manifold
alan@mashiyyat.net
+61 0419 671 913
EVALUATIONS

Please fill out an evaluation form, so the workshop can continue to improve.