Shelly Cashman Series Microsoft Office 365 and Access 2016 Introductory 1st edition Pratt Solutions Manual

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Microsoft Access 2016

Module Two: Querying a Database

A Guide to this Instructor's Manual:
We have designed this Instructor's Manual to supplement and enhance your teaching experience through classroom activities and a cohesive module summary.

This document is organized chronologically, using the same heading in **red** that you see in the textbook. Under each heading you will find (in order): Lecture Notes that summarize the section, Teacher Tips, Classroom Activities, and Lab Activities. Pay special attention to teaching tips, and activities geared towards quizzing your students, enhancing their critical thinking skills, and encouraging experimentation within the software.

In addition to this Instructor's Manual, our Instructor's Resources also contain PowerPoint Presentations, Test Banks, and other supplements to aid in your teaching experience.

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Objectives

Students will have mastered the material in Module Two when they can:

- Create queries using Design View
- Include fields in the design grid
- Use text and numeric data in criteria
- Save a query and use the saved query
- Create and use parameter queries
- Use compound criteria in queries
- Sort data in queries
- Join tables in queries
- Create a report and a form from a query
- Export data from a query to another application
- Perform calculations and calculate statistics in queries
- Create crosstab queries
- Customize the Navigation Panel

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AC 65: Introduction

LECTURE NOTES

- Define query and introduce the topic of querying a database

TEACHER TIPS

Introduce this module by reminding students that when they use an online search engine, such as Google or Bing they are really asking questions of a database. When they access the online catalog at the library, they also are querying a database.

Querying is one of the main benefits of creating a database. Users want to be able to find answers quickly to questions concerning the data.

CLASSROOM ACTIVITIES

1. Quick Quiz:
    1) What is a query? (Answer: a question presented in a way that Access can process)

AC 65: Project — Querying a Database

LECTURE NOTES

- Review the types of questions that you can ask a database, such as PrattLast Associates using Figure 2-1
- Review the general activities that will be performed in this module
    - Create queries in Design view
    - Use criteria in queries
    - Sort data in queries
    - Join tables in queries
    - Export query results
    - Perform calculations in queries
    - Create a crosstab query
    - Customize the Navigation Pane

TEACHER TIP

You can use the Lecture Success System for Access in conjunction with the Figures in the Book. To do this, start Access and open the database from the appropriate folder. Then, start your slide show containing the figures for the project. You can switch back and forth between the slide show and Access by using the ALT+TAB key combination. You can use the Figures in the Book to show the steps students should follow. If students need additional reinforcement or ask questions about the task, you can switch to Access to do a live demonstration.

CLASSROOM ACTIVITIES

1. Class Discussion: Ask students for other questions they could ask the PrattLast Associates database.

2. Class Discussion: Ask students for sample questions that might be asked of a student database.

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AC 67: Creating Queries

LECTURE NOTES

- Point out the Note on saving queries
- Use Figures 2-2 through 2-4 to discuss how to create a query in Design view
- Describe how to add fields to the design grid using Figure 2-5
- Explain that you use criteria to limit retrieval
- Define text data and use Figures 2-6 through 2-9 to discuss using text data in a criterion
- Discuss the various ways you can use a saved query:
    - View the results
    - Change the design
    - Print the results
    - Switch between views
- Define wildcard and explain the difference between an asterisk and a question mark
- Use Figures 2-10 through 2-14 to review the steps to use a wildcard
- Describe the steps for using criteria for a field not included in the results using Figures 2-15 through 2-17
- Discuss parameter queries and point out the advantages
- Use Figures 2-18 through 2-21 to describe the steps to create and view a parameter query
- Discuss how to use a parameter query using Figure 2-22
- Use Figures 2-23 and 2-24 to review the steps to use a number in a criterion
- Use Figures 2-25 and 2-26 to define comparison operator and review the specific comparison operators
- Discuss using compound criterion and explain the difference between AND criterion and OR criterion
- Use Figures 2-27 and 2-28 to review the steps to use AND criterion
- Use Figures 2-29 and 2-30 to review the steps to use OR criterion
- Discuss the three special criteria that you can use in queries
    - AND operator within a single field
    - BETWEEN operator
    - IN operator

TEACHER TIPS

Students are asked to save each query as they create it. This makes it easier to track student project completion electronically.

Use Figure 2-4 to point out the field row and the criteria row in the design grid. A query can be a subset of the records in a table, a subset of the fields in a table, or a subset of both records and fields. The order of the fields also can be changed. Access uses Query-by-Example (QBE) to query a database. Query-by-Example is a query manipulation language for relational databases in which users indicate the action to be taken by completing on-screen forms. The query feature of Microsoft Excel uses QBE, as does Microsoft Works.

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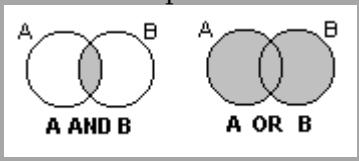
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Students should understand that although the answer displays in Datasheet view, no table exists. It is a dynamic or virtual set of records. When a query design is saved, only the design is saved not the answer. Query results, therefore, always show the most current data.

When a criterion is entered in a query, the criterion is an example of the expected result. Entering criterion in a query is similar to entering an author's name in a search of a library card catalog or an electronic library database. The asterisk and question mark wildcards are the same wildcards that are used with the search features in Windows and other Microsoft applications. Access automatically adds the LIKE operator and quotation marks to criteria that use wildcards.

Comparison operators are used with both numeric and text data. The order of the greater than or equal to (>=) and less than or equal to (<=) operators is fixed; they cannot be reversed. The <> operator also can be used to indicate NOT.

You can use a Venn diagram to illustrate the concept of AND and OR criterion visually:



Several of the exercises at the end of the module require students to use compound criteria.

You can use either the View button or the Run button to view query results. The Run button appears on the DESIGN tab only.

CLASSROOM ACTIVITIES

1. Assign a Project: Have students research QBE, an early language for creating queries and then share the results of their research with the class.

2. Class Discussion: Design a truth table on the board and fill in the values with the students. Ask students for other uses of a truth table.

3. Critical Thinking: What are some other uses for parameter queries?

4. Critical Thinking: Querying means asking questions. What kind of questions do you ask in a typical day? Would a database be able to answer those questions?

5. Critical Thinking: Your school library has many databases that you can search. What do you need to know before you search those databases? Why?

6. Quick Quiz:

1) If "M*" is entered as a criterion in a field in the design grid, what does it mean? (Answer: That the value in the field must start with "M" followed by any collection of characters)
2) If "M?" is entered as a criterion in a field in the design grid, what does it mean? (Answer: That the value in the field must start with "M" followed by any single character)
3) What is the purpose of the Show check box in the design grid? (Answer: The Show check box indicates whether a field is displayed in the result. A check mark in the check box indicates that

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a field is to be included in the result. If there is no check mark, a field will not appear in the results.)

4) What five comparison operators can be used in queries? (Answer: >, <, >=, <=, NOT)

LAB ACTIVITIES

1. Have students use Access Help to find other wildcards that can be used in queries.

2. Have students create a query that uses the IN operator and the BETWEEN operator.

AC 83: Sorting

LECTURE NOTES

- Define sort, sort key, major key, primary sort key, minor key, secondary sort key
- Discuss the reasons for sorting records
- Use Figure 2-31 to illustrate clearing the design grid
- Use Figures 2-32 through 2-34 to illustrate sorting data in a query
- Define property sheet and use Figures 2-35 through 2-37 to illustrate omitting duplicates
- Use Figures 2-38 and 2-39 to illustrate sorting on multiple keys
- Define top-values query and use Figures 2-40 and 2-41 to illustrate creating a top-values query

TEACHER TIPS

Students often have a difficult time understanding the difference between a major key and a minor key. Emphasize that the major key must be to the left of the minor key. Mention that it is not possible to sort on an asterisk. To sort a query that includes an asterisk, add the individual fields that must be sorted to the design grid and remove the check mark from the Show check box.

If students right-click a field and a property sheet other than the Query Properties sheet appears, it probably is because they did not right-click in the second field of the grid. Close the sheet that appears, and position the mouse in the second field of the grid.

Students often have problems sorting on multiple keys because they do not understand the phrasing of sort questions. For example, in the phrase *city within state*, the major sort key is *state*, which follows the word within. In this type of query, however, it is usual to display the city field before the state field. To display city before state but sort by city within state, add the state field again to the design grid and remove the check mark from the first state field (major sort key). The Access Help system provides additional information on the procedure.

It is very important that students either close a query or reset the value in the Return box to All after they complete a top-values query. Otherwise, the next query they create may have incorrect results.

CLASSROOM ACTIVITIES

1. Critical Thinking: Sorting means ordering records in a particular way. When would it be useful to sort data in ascending order? Why? When would it be useful to sort data in descending order? Why?

2. Critical Thinking: Would you have duplicate records if you were sorting on two sort keys?

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3. Critical Thinking: Would top-values queries be useful in a school database? Why or why not?

AC 89: Joining Tables

LECTURE NOTES

- Explain about joining tables using Figure 2-42
- Use Figures 2-43 through 2-46 to describe how to join tables
- Define join properties
- Use Figures 2-47 through 2-49 to describe how to change join properties
- Review the steps to create a report involving a join using Figures 2-50 through 2-53
- Review the steps to print a report

TEACHER TIPS

Use Figure 2-42 to explain joining to students. One of the key features of relational database management systems is the ability to join tables on matching fields.

There are two primary reasons why Access would not add a join line between two related tables: (1) the fields do not have matching names or (2) the data type and data length are not identical on both fields. If fields are identical but do not have matching names, students should click the appropriate field in one of the tables and drag a join line to the matching field in the other table. If the fields do not have identical data types and data length, students should open the table that is in error in Design view, correct the problem, and then create the query. If students do not correct the error now, they will be unable to create the relationship between the Account Manager and Account tables in Module 3.

The specific type of join shown in this module (option 2) is a right outer join because all the records in the one table in the relationship will display. Changing the join type to option 3 would create a left outer join because all records in the many table in the relationship would display.

CLASSROOM ACTIVITIES

1. Critical Thinking: Why does PrattLast Associates need two tables: Account Manager and Account? What would happen if all the data were in one table? Would that make it easier to search?

2. Critical Thinking: What would the query result be if option button 3 were selected in Figure 2-48?

3. Critical Thinking: Would a join line appear if the primary key of the Account Manger table were named Manager ID?

4. Critical Thinking: Identify some reasons for changing the join type properties.

5. Assign a Project: Divide the class into small groups. Assign each group a different database. Example databases include: University database (Students, Teachers, Courses); Employment database (Employees, Departments); Bookstore database (Books, Authors, Publishers); and Video Store database (Movies, Directors, Actors, DVDs). Ask students to create sample questions that would rely on data from more than one table.

LAB ACTIVITIES

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1. Have students use the different join types in queries.

AC 96: Creating a Form for a Query

LECTURE NOTES

- Use Figures 2-54 and 2-55 to explain creating a form from a query
- Discuss how you use the form

CLASSROOM ACTIVITIES

1. Quick Quiz:
    1) What is a form? (Answer: a formatted document with fields that contain data)

AC 97: Exporting Data from Access to Other Applications

LECTURE NOTES

- Define export
- Use Figure 2-56 to discuss exporting data
- Use Figures 2-57 through 2-60 to describe how to export data to Excel
- Discuss the steps to export data to Word; point out that you export the data as a rich text format (RTF) file, not a Word file
- Discuss text files and explain delimited files, delimiter, and fixed-width files
- Review the steps to export data to a text file

TEACHER TIPS

The export feature of Microsoft Access makes it very easy to export files in various formats for use with other applications.

When you export query results to a worksheet, the query is run against the current Access database. Once the data is exported to Excel, it no longer is linked to the database. Any changes made to the Excel worksheet will not affect the Access database.

CLASSROOM ACTIVITIES

1. Quick Quiz:
    1) What is a delimited file? (Answer: a file in which each record is on a separate line and the fields are separated by a special character, called the delimiter)
    2) What is a fixed-width file? (Answer: a file in which the width of any field is the same on every record)

2. Critical Thinking: Why would you want to save export steps?

LAB ACTIVITIES

1. Have students export the Manager-Account Query in various formats.

AC 101: Adding Criteria to a Join Query

LECTURE NOTES

- Use Figures 2-61 and 2-62 to describe how to restrict the records in a join query

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CLASSROOM ACTIVITIES

1. Quick Quiz:
   1) You always want to include all possible records. T/F? (Answer: F)

AC 102: Calculations

LECTURE NOTES

- Explain individual record calculation, group calculation, and calculated field or computed field
- Use Figures 2-63 through 2-66 to describe how to use a calculated field in a query
- Use Figures 2-67 and 2-68 to review the steps to change a caption
- Define aggregate function and discuss the different built-in functions
- Use Figures 2-69 through 2-72 to review the steps to calculate statistics
- Use Figures 2-73 through 2-75 to describe how to use criteria in calculating statistics
- Use Figures 2-76 and 2-77 to discuss grouping and review the steps to use grouping

TEACHER TIPS

Review the mathematical operators that can be used in calculated fields. When more than one mathematical operator appears in an expression, multiplication and division are performed before addition and subtraction. To change the order of precedence, use parentheses. Make sure students understand that only field names must be enclosed in brackets. If constants, such as .05, are used in an expression, they are not enclosed in brackets.

Point out to students that storing data that easily can be calculated from other fields wastes space. It also makes the database more difficult to maintain. Access 2013 does include a calculated field as a data type but for the most reliable results, you should use a query.

Explain the aggregate functions that Access supports:

COUNT	Determines the number of items or values.
SUM	Adds the values.
AVG (average)	Determines the arithmetic mean of values.
MAX (largest value)	Determines the greatest value.
MIN (smallest value)	Determines the smallest value.
STDEV (standard deviation)	Measures how widely values are dispersed from the average value.
VAR (variance)	Squares the standard deviation.
FIRST	Determines the first item or value.
LAST	Determines the last item or value.

AVG, SUM, STD, and VAR can be used only with numeric fields. An aggregate function is different from a calculated field. A calculated field is a mathematical operation performed on individual records. An aggregate function is performed on groups of records.

CLASSROOM ACTIVITIES

1. Critical Thinking: Use the PrattLast Associates database to determine if additional calculated fields are useful. Would any calculated fields be useful in the Account Manager table?

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2. Critical Thinking: Do Excel and Access use the same aggregate functions? In Access, you use field names as arguments. What do you use in Excel?

3. Critical Thinking: Why would you want to use grouping in a query?

LAB ACTIVITIES
1. Have students use the expression builder to create queries that use calculated fields. Students should report on how useful they found the expression builder.

AC 108: Crosstab Queries

LECTURE NOTES
- Discuss crosstab queries using Figure 2-78
- Use Figures 2-79 through 2-84 to review the steps to create a crosstab query
    - Step 7 includes personalization. Students can name the crosstab query with their first and last names

TEACHER TIP
Use Figure 2-78 to help students understand the row and column data. Crosstab queries can be created in Design view but it is much easier to use the Crosstab Query Wizard.

Step 7 on page AC 111 includes personalization. You can require students to name the crosstab query with their first and last name.

CLASSROOM ACTIVITIES
1. Critical Thinking: How would you create a crosstab without using the Crosstab Query Wizard?

2. Critical Thinking: What type of crosstab queries would be of interest in a school database?

AC 111: Customizing the Navigation Pane

LECTURE NOTES
- Describe how to customize the Navigation Pane using Figures 2-85 through 2-87

CLASSROOM ACTIVITIES
1. Critical Thinking: The two most common ways to organize the Navigation Pane are by Tables and Related Views and by Object Type. What are the benefits of each organization?

AC 113: Module Summary

LECTURE NOTES
- Review the skills learned in this module

End of Module Material

- **Apply Your Knowledge** is an assignment that helps students reinforce their skills and apply the concepts learned in this module.

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- **Extend Your Knowledge** is an assignment that challenges students to extend the skills learned in this module and to experiment with new skills. Students may need to use Help to complete the assignment.

- **Expand Your World** is an assignment where students create a solution that uses cloud or web technologies by learning and investigating on their own from general guidance

- **In the Lab** is a series of assignments that ask students to design and/or format a database using the guidelines, concepts, and skills presented in this module.

TEACHER TIPS
Students are asked to save each query, report, and form they create as an object in the database. This should make it easier to correct assignments electronically.

Encourage students to read each query carefully to determine which fields should display in the result.

If students created the tables correctly in module 1, the join line should occur automatically. If it does not, refer students to the BTW on page AC 89.

To correct the sort query in the Analyze, Correct, Improve exercise, students need to add the Last Name field to the query a second time as the last column in the query. Then, specify ascending as the sort and remove the check mark from the Show check box. The records will display and sort correctly. To correct the criteria query in the Analyze, Correct, Improve exercise, students need to include the asterisk (*) wildcard before the street name.

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Lab 3 Consider This: Your Turn

Camshay Marketing Associates

Sample Grading Rubric

Part 1:

Consider This: Plan Ahead Guidelines	Grading Notes	Suggested Percent	Score
1. Identify the fields by examining the question or request to determine which fields from the tables in the database are involved.	Each query identifies the fields to include in the result.	5	
2. Identify restrictions or the conditions that records must satisfy to be included in the results.	Query a uses a comparison operator with a Date field. Query b uses a wildcard. Query c uses comparison operators and the OR operator. Query d uses a text criterion.	40	
3. Determine whether special order is required.			
a). Determine the sort key(s)			
b). If using two sort keys, determine the major and minor key.			
c). Determine sort order. If there are no words to imply a particular order, you would typically use Ascending			
4. Determine whether more than one table is required.	Query g is a join query with sorting on two fields	10	
a). Determine which tables to include.			
b). Determine the matching fields.			
c). Determine whether sorting is required.			
d). Determine restrictions.	Query h restricts the records in the join query.	5	
e.) Determine join properties			
5. Determine whether calculations are required.			
a).For individual record calculations, determine the calculation and a name for the calculated field.			
b). For group calculations, determine the calculation as well as the field to be used for grouping.			
If data is to be summarized and the data is to be grouped by two different types of information, create a crosstab query.	Query f is a crosstab query.	20	
	Query e is a parameter query	20	

Part 2: Critical Thinking Decisions

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This assignment requires students to explain why they made these decisions in querying their databases.

- Wildcards in criterion
- Comparison operators with date fields
- Compound criteria using OR logic
- Parameter queries
- Restrict retrieval in a join query
- Crosstab queries

Students also should explain the two ways to create the parameter query in step e and identify which one they used

Possible Answer:

Because the parameter query includes all fields in the query results, you can either double-click each field to add it to the design grid and then enter the parameter in the City field. You also could double-click the asterisk to add all fields, then add the City field, remove the check mark from the field so it doesn't appear a second time in the result, and enter the parameter.

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Answers to Critical Thinking Questions – Module 02

Student answers could vary from those presented in this document.

Apply Your Knowledge – Assignment Instruction

8. What criteria would you enter in the Street field if you wanted to find all clients whose businesses were on Beard?

Apply Your Knowledge – Possible Answers

8. You would enter ***Beard*** in the Criteria row of the design grid for the Street field.

Extend Your Knowledge – Assignment Instruction

10. How would you create the query in Step 4 without using the IN operator?

Extend Your Knowledge – Possible Answer

10. You would enter **>550** in the Criteria row for the Balance field and **29** in the same row for the Team Leader Number field. Then in the or row, you would enter **>550** again in the Criteria row for the Balance field and **32** in the same row for the Team Leader Number field.

Expand Your World – Assignment Instruction

6. Which websites did you use to gather data and search for historical averages? How does the query result in Step 3c differ from the historical average?

Expand Your World – Possible Answer

6. Answers will differ but students should be able to cite the websites they used and support their response with reasons.

Lab 1 – Assignment Instruction

14. How would you modify the query in Step 7 to include only sales reps that currently have customers?

Lab 1 – Possible Answer

14. Right-click the join line and click Properties on the shortcut menu. Change the join type property to option 1 (Only include rows where the joined fields from both tables are equal.)

Lab 2 – Assignment Instruction

16. How could you modify the query in step 2 to find all vendors where the vendor code is AW or GS? If there is more than one way to perform this query, list all ways.

Lab 2 – Possible Answer

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16. You would enter **AW** on the Criteria row for the Vendor Code field and enter **GS** oin the or row for the same field. As an alternate, you could enter **IN ("AW","GS")** on the Criteria row

Lab 3: Consider This: Your Turn

See the Lab 3 Consider This: Your Turn Rubric File for possible answers to the critical thinking questions.

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City	Total Of Balance	26	29	32
Chester	$985.00	$180.00	$805.00	
Lancaster	$3,301.60	$515.00	$1,000.50	$1,786.10
Rock Hill	$3,650.30	$1,790.50	$1,514.80	$345.00
York	$530.00			$530.00

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Answers to Critical Thinking Questions – Module 02

Student answers could vary from those presented in this document.

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6. Which websites did you use to gather data and search for historical averages? How does the query result in Step 3c differ from the historical average?

Expand Your World – Possible Answer

6. Answers will differ but students should be able to cite the websites they used and support their response with reasons.

Lab 1 – Assignment Instruction

14. How would you modify the query in Step 7 to include only sales reps that currently have customers?

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14. Right-click the join line and click Properties on the shortcut menu. Change the join type property to option 1 (Only include rows where the joined fields from both tables are equal.)

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Chester	$985.00	$180.00	$805.00	
Lancaster	$3,301.60	$515.00	$1,000.50	$1,786.10
Rock Hill	$3,650.30	$1,790.50	$1,514.80	$345.00
York	$530.00			$530.00

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Lab 3 Consider This: Your Turn

Camshay Marketing Associates

Sample Grading Rubric

Part 1:

Consider This: Plan Ahead Guidelines	Grading Notes	Suggested Percent	Score
1. Identify the fields by examining the question or request to determine which fields from the tables in the database are involved.	Each query identifies the fields to include in the result.	5	
2. Identify restrictions or the conditions that records must satisfy to be included in the results.	Query a uses a comparison operator with a Date field. Query b uses a wildcard. Query c uses comparison operators and the OR operator. Query d uses a text criterion.	40	
3. Determine whether special order is required.			
a). Determine the sort key(s)			
b). If using two sort keys, determine the major and minor key.			
c). Determine sort order. If there are no words to imply a particular order, you would typically use Ascending			
4. Determine whether more than one table is required.	Query g is a join query with sorting on two fields	10	
a). Determine which tables to include.			
b). Determine the matching fields.			
c). Determine whether sorting is required.			
d). Determine restrictions.	Query h restricts the records in the join query.	5	
e.) Determine join properties			
5. Determine whether calculations are required.			
a).For individual record calculations, determine the calculation and a name for the calculated field.			
b). For group calculations, determine the calculation as well as the field to be used for grouping.			
If data is to be summarized and the data is to be grouped by two different types of information, create a crosstab query.	Query f is a crosstab query.	20	
	Query e is a parameter query	20	

Part 2: Critical Thinking Decisions

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This assignment requires students to explain why they made these decisions in querying their databases.

- Wildcards in criterion
- Comparison operators with date fields
- Compound criteria using OR logic
- Parameter queries
- Restrict retrieval in a join query
- Crosstab queries

Students also should explain the two ways to create the parameter query in step e and identify which one they used

Possible Answer:

Because the parameter query includes all fields in the query results, you can either double-click each field to add it to the design grid and then enter the parameter in the City field. You also could double-click the asterisk to add all fields, then add the City field, remove the check mark from the field so it doesn't appear a second time in the result, and enter the parameter.

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