**CIS120 Programming: Logic, Design and Implementation**

 **Final Exam Spring 2020**

This is an open note/open book **final exam - it is also an individual project. You may receive help ONLY from me*.******This exam is given using the honor system with my trust in you and my confidence that you will not betray that trust.*** ***Working with other people or asking questions of other people is a betrayal of that trust - it is cheating. Helping other people or answering their questions is also a betrayal of that trust - it is cheating.*** **If you have any questions, e-mail me to clarify or make an appointment to tslk. The completed exam should be turned in via e-mail by the posted date for submitting the final. You must also turn in the status sheet that is posted at the site. The final must be passed in by the posted data or you will lose points. You should email me the exam and the status sheet. Email it to the regular email and also for good measure to Priscilla.Grocer@bristolcc.edu. Again, please remember that the status sheet is a requirement for the course and I will only correct exams for people who turn in the status sheet.**

I do not tend to view final exams as a time to test you, but rather as a time for you to review and solidify your knowledge. Last chance to learn the course material... So, here goes...
Some questions are required others are optional. You need to put together your exam based on the goal of earning 100 points. You may accumulate up to 110 (10 points of extra credit). You may do more than 110 points but when I reach 110, I stop correcting. Since some points are required, you only have choices for accumulating points beyond the required points. In other words if you omit or earn no points on a required 20 point question, you cannot make up the required points with optional problems.

Note the required (if correct) add up to 65 points, so you need to do enough optional to reach 100 or 110.

**Problem #1 OPTIONAL 20 points**

Set up a database with these two tables using an Access Database. Remember field names should not have embedded spaces and Short Text fields should have a reasonable size. Inventory File. Do note that this is not a realistic inventory design.

|  |  |  |  |
| --- | --- | --- | --- |
| Item No | Item Name | OnHand | On Order |
| 11111 | Koala Backback | 100 | 150 |
| 12111 | Wildlife Calendar | 70 | 100 |
| 12345 | Handpainted Boomerang | 56 | 50 |
| 13456 | Kangaroo Cutting Board | 16 | 25 |
| 12666 | Koala Coasters | 34 | 35 |
| 14999 | Kola Ceramic Mug | 5 | 45 |
| 15234 | Platpus Beanie | 23 | 50 |
| 15678 | Kangaroo Charm | 121 | 0 |
| 16789 | Terracota Vase | 38 | 15 |

Transaction File (Note that the Action Code has R for receipt into inventory, S for sold from inventory and X for a return that increases inventory).

|  |  |  |
| --- | --- | --- |
| Item No | Action Code | Quantity |
| 11111 | S | 8 |
| 11111 | X | 1 |
| 12111 | S | 10 |
| 12345 | R | 50 |
| 13456 | S | 25 |
| 14999 | R | 5 |
| 15678 | S | 21 |
| 16789 | S | 20 |
| 16789 | R | 10 |

Queries:

1. Show the item no, action code and quantity where action code = R or quantity is greater than 25.
2. Show the item no, item name, action code, quantity where quantity is greater than 20.
3. Show the item no, item name, on hand where the action code is S and the quantity is greater than 10.
4. Show the item no, item name, on hand, on order, action code, quantity where on hand is > 20 and on order > 20 OR action code is R and quantity < 50.
5. Show the item no, item name, action code, on hand quantity where Action Code is S and either Quantity is greater than 10 or OnHand is greater than 50.

**Problem #2 OPTIONAL 10 points**

|  |  |
| --- | --- |
| T or F | Question: Remember, if the answer is false, you must tell why? |
|  | 1. price – cost = profit is a legal statement in programming
 |
|  | 1. In a decision, if theAns is not greater than amtIn, it means that amtIn is less than theAns.
 |
|  | 1. You can use either a letter or an integer as a direct subscript index/pointer to an array.
 |
|  | 1. Source code is written by the programmer using a programming language and object code is the code that is actually executed.
 |
|  | 1. If you want the condition to end the loop to determine whether or not you execute the loop at least once, you should put the condition at the beginning of the loop.
 |
|  | 1. Compiling can be used to find programming syntax errors and logic errors.
 |
|  | 1. Variable names can contain spaces in most languages
 |
|  | 1. If you want to be sure that a loop is executed at least once, you put the condition to test at the beginning of the loop.
 |
|  | 1. An initializing or priming read is the first read or data input statement in a program.
 |
|  | 1. When you declare a variable in program code, an area in memory is reserved to hold the contents of the variable.
 |

**Problem #3 REQUIRED 12 points**

Answer the following questions related to the flowcharts below. Note that with diamond shape questions the Y goes off to the right and the N goes off to the left or N goes down. Do not write a whole program, just write the code for what appears in the flowchart.

1. Write the code for this decision flowchart using VisualBasic or JavaScript.

salary > 75000

newSal = salary \*

1.1

newSal = salary \* 1.08

Display/write newSal

1. Write the code for this decision flowchart using Visual Basic or JavaScript.

ct = 0

ct < 10

totRslt = totRslt + amt

ct = ct + 1

1. Write the code for this decision flowchart using Visual Basic or JavaScript.

ct = 0

totRslt = totRslt + amt

ct = ct + 1

ct < 10

**Problem #4 REQUIRED 10 points**

Answer the following questions and give reasons for your answers.

1. Explain the differences in the logic of the second and third flowcharts in Problem #3. If ct was initialized at 10 in the second flowchart, what would happen? If ct was initialized at 10 in the third flowchart what would happen?
2. If you want to be sure that a loop is executed at least once, should you put the condition at the beginning of the loop or at the end of the loop?
3. What are three things that must be done if you are using a memory variable like ct to control a loop?
4. If you have multiple embedded if statements, how is it determined what if statement an else will attach itself to.
5. True or False: There are three programming sections: Startup or housekeeping where one time things like opening files are done, processing where the things you are repeating for each record or each set of data is done and wrapup where one time things like closing file and writing final totals are done.
6. How do you code the statement condition1 and either condition2 or condition3. Show the answer in SQL and JavaScript.
7. If you want to take in user input during a loop in Visual Basic, you should not use boxes on the form because the processing does not halt to allow a change in input. How can you ask the user for input when the request is coming from inside a loop?
8. What are the three things that a programming language must be capable of doing to be classified as a language?
9. Write the statement that tests for code equal to A and either amt greater than 30 or rslt greater than 50 in SQL and explain how it would be entered on the user interface grid if you were not using SQL.
10. Write the statement that tests for code equal to A and either amt greater than 30 or rslt greater than 40 in either JavaScript or Visual Basic.

**Problem #5 REQUIRED 20 points**

**Design a table to catalog the software you download or purchase**

Create a table in an ACCESS database to catalog a collection of software that you have downloaded. Clearly you could develop a far more sophisticated table. I am giving you a basic design that you can use or you can expand upon it. If you follow my model, the fields you want to carry on each record in your database table should be:

* software id (a number you assign)
* name of software
* source/developer
* release/version
* date
* type of software (you develop a code to classify)
* open source or free or purchased (again use a code)

I strongly suggest that you make up short easy names for the fields/columns in the table. Remember no embedded spaces in your field names. You should also make sure that your field lengths for your text fields are realistic. The fields should be appropriately named with an appropriate size and type. Populate the table so that you can effectively query it – look at the queries below to determine the questions. Note that there should be 10 records or more on your table.

**Do the following queries using the user interface:**

1. Do a query to show all of the fields for two tests that are in an OR relationship (for example a particular developer or a particular release/version)
2. Do a query to show all of the fields for a particular developer AND a particular type of software code OR just a particular code in open source or free or purchased is true.
3. Do a query to show all of the fields for a particular developer AND **either** a particular type of software code OR a particular code in open source or free or purchased.

Do the following queries using SQL  **(I want clean SQL code you write, not SQL code generated by Access and I want a copy of the SQL code attached as part of the written final):**

1. Do a query using SQL that tests for the following criteria: condition1 is true and condition2 is true and condition3 is true.
2. Show all of the fields for records that meet the following criteria: condition1 is always true AND EITHER condtion2 OR condition3 is true. The tests should be on three different fields.
3. Show all the fields for records that meet the following criteria: condition1 and condition2 are both true OR condition3 and condition4 are both true OR condition5 and condition6 are both true. On this one you may test the same field for different criteria.
4. Do a query that will return all records that have a particular source/developer and in addition either have a release/foundation of a particular code or the type of software has a particular code.

**Problem #6 OPTIONAL 10 points**

Create this page using HTML



To do this you will need the following files:

<http://www.pgrocer.net/infoFinal/TASC.txt> where you can get the text to paste onto the page

<http://www.pgrocer.net/infoFinal/logoA.png> where you can get the BCC image

The words below BCC can be retried by going to the same address for logoB.png

**Problem #7 OPTIONAL 6 points**

Answer the following questions

1. What command can be used in Visual Basic to convey information in a popup the way the alert does in JavaScript.
2. What command can be used in Visual Basic to take in information the way the prompt does in JavaScript.
3. In JavaScript you use parseInt with whole number input data you want to add. How do you do the same thing in Visual Basic.
4. Errors in the use of the programming language such as word usage and grammar are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ errors. Choose: A) logic B) data C) development D) syntax
5. When you test a program that has successfully compiled with data, you are looking for \_\_\_\_\_\_\_\_\_\_\_\_\_\_ errors. Choose: A) syntax B) logic C) compiler D) language
6. In programming, you use quotation marks to enclose: Choose: A) String or character literals B) numeric literals C) variable names D) string or character or numeric literals

**Problem #8 OPTIONAL 15 points**

|  |  |
| --- | --- |
| **Question #1:** You want to keep the social security number, name, job code and pay rate for your employees. What is the data hierarchy name for each of these data items?  | A/ fieldB/ file or tableC/ recordD/ character |
| **Question #2:** Looking at the data in the problem above: you want to store all of the information about a specific employee together. What is the data hierarchy name for storing these fields together as a unit?  | A/ fieldB/ file or tableC/ recordD/ character |
| **Question #3:** Looking at the data in the problem above: you want to store all of the information about all of the employees of your company together. What is the data hierarchy name for storing these fields together as a unit?  | A/ fieldB/ file or tableC/ recordD/ character |
| **Question #4:** Data that is stored in locations in memory are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_? An example would be storing the result of a calculation in memory.  | A/ alphaB/ instructionsC/ variablesD/ variables andinstructions |
| **Question #5:** The software that translates a high – level or source program into machine language is \_\_\_\_\_\_\_\_\_\_\_ ?  | A/ compilerB/ interpreterC/ executerD/ both compilerand interpreterapply |
| **Question #6:** A database is made up of a group of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ that hold the collection of data. For example, there might be one holding inventory information and one holding customer information.  | A/ tablesB/ columnsC/ variablesD/ none of the above |
| **Question #7** Calculating an answer and storing it to a named memory location is using \_\_\_\_\_\_\_\_\_\_\_\_ ?  | A/ comparisonB/ equalC/ assignmentD/ compiling |
| **Question #8: True or False:** You cannot execute a program to produce output if it has critical syntax errors.  | T/ TrueF/ False |
| **Question #9:** The three structures that define all programming logic are \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | A/ selection, process, loopB/ sequence, selection, loopC/ sequence, iteration, loopD/ sequence, repetition, case |
| **Question #10:** Which of the following is **NOT** an acceptable name for the structure that allows you to do the same set of instructions multiple times?  | A/ repetitionB/ iterationC/decisionD/loop |
| **Question #11:** When one module causes another module to execute, the first module is \_\_\_\_\_\_\_\_\_\_\_ the second module.  | A/definingB/ reusingC/ declaringD/ calling |
| **Question #12 True or False:** In logic, ANDs get resolved before ORs but this can be altered through the use of parenthesis.  | T/ TrueF/ False |
| **Question #13: True or False:** After reading an input record, the programmer should always check and see if the read was successful or whether EOF was encountered.  | T/ TrueF/ False |
| **Question #14: True or False:** Some languages require you to specify the length of all variables, other languages assign a predetermined size depending on the type for some types of variables.  | T/ TrueF/ False |
| **Question #15: True or False:** Giving a starting value to a variable is known as initializing the variable. The value in the variable can be changed as the program executes.  | T/ TrueF/False |

**Problem #9 REQUIRED 15 points**

You need to write a program to solve this problem in either Visual Basic or JavaScript. I want to see the code and I want you to take a picture of the screen that shows the output and attach that as well.

If an order is received, a discount may be given based on the price times the quantity of the items ordered. The user enters the item number of the item, the price of the item and the number ordered. The program calculates the price times the quantity and checks to see if a discount is warranted. If so, the discount is taken. Then the item number and the result of the calculation with discount taken is displayed. If there is no discount you still display the item number and the result of the calculation.

|  |  |
| --- | --- |
| ***Price times quantity*** | ***Discount percent*** |
| Under 1000 | No discount |
| Between 1000 and 4999 | 5% |
| 5000 or more | 10% |

**Problem #10 REQUIRED 8 points**

Draw the logic flowchart or write the pseudocode to solve these problems.

* 1. You want to take in input from the user on job code, salary and years employed at the company. You want to check to see if the job code is A and either the person has a salary greater than 60000 or has worked for the company more than 5 years. Write out or display the records that meet the criteria.
	2. You want to take input from the user for student id, gpa and number of courses taken and number of courses passed. If the student that is entered has a gpa > 3 and has taken over 15 courses and passed over 14 courses display the message good job. Otherwise display the message see your advisor.