**Programming: Logic, Design and Implementation**

**CIS120 Final Exam**

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

This is a take home **final exam - it is also an individual assignment. You may receive help ONLY from me*.***If you have a question, it is your responsibility to email me within a timely manner to ensure that I have the opportunity to provide you with a response.

This exam is made up of several skills that you should have taken away from this course throughout the semester. You will have the ability to “make your own exam” based on your goal of earning 100 as your grade. You may accumulate up to 110 (10 points for extra credit). You are welcome to do more than 110 points worth, but I will not correct your exam beyond earning 110 points of credit.

Each section is denoted as either Required or Optional. 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 the maximum you can earn is 90 points (110-20=90). You cannot make up the required points with optional problems.

For any solutions that you are providing within this file, the font color must be something other than black and it must be legible.

**Assignment Submission:** Upon receipt of this exam, save it with the following name CIS120\_TH\_FinalExam\_*YourName*\_Spring2020. For submission, your email subject must be CIS 120 *Your Name* Final Exam. Be sure to replace all references to *Your Name* with your actual name. Upon completion of your exam, save this document, along with any support materials (labeled accordingly), to a zipped folder with the same name as this file and email it to RoseFerro@Bristolcc.edu. If you do not receive a response from me within 24 hours, it is important that you contact me to ensure that I have received your submission.

Your final exam must be submitted no later than **11:59PM on Sunday, May 17**.

**Final Portfolio:** *As part of your course requirements, you were required to complete and post your CIS 120 portfolio online. Provide me with the URL of your portfolio in the space below. Please be sure to confirm that your URL works prior to submitting it to me!*

**Your URL:** *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

**Problem #1 REQUIRED (20 points)**

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

Create a table within a database to catalog a collection of Netflix Movies that you would like to view. You could develop a far more sophisticated table, however, I am giving you a basic design that you may begin with and expand upon of you choose to do so. If you follow my model, the fields you will need to incorporate are the following:

* movie id (a number you assign)
* movie title
* producer
* release date (this can be a particular month / year combination if preferred)
* genre (you develop a code to classify) – For example, CMD for Comedy.
* available on Hulu? (Yes / No selection)
* classic (would you consider this movie to be a classic / cult classic? Yes / No)

I strongly suggest that you make up short easy names for the fields/columns in the table. Remember that you should not embed spaces into your field names. You should also make sure that the 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 your table should be populated with at least 10 records.

**Do the following queries using the Design View:**

1. Do a query to show all of the fields for two tests that are in an OR relationship (for example a particular producer or a particular genre)
2. Do a query to show all of the fields for a particular release date AND a particular genre OR a classic movie available on Hulu
3. Do a query to show all of the fields for a genre AND **either** a particular producer OR a particular release date.

**Write the following queries in 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.

Your final database should be named CIS120\_FinalExam\_*YourName*\_Problem1 and each of your queries should be named accordingly (i.e. Q1, Q2, SQL1, SQL2, etc.).

**Problem #2 REQUIRED (20 points)**

Hopefully this course has helped you to see that the logic of directing a computer can be expressed in many ways. We have looked at flowcharts, pseudocode, Access SQL, and JavaScript. Now I am going to ask you to pull this together and see the logic of doing things in sequence, with conditions and in loops.

**Problem #2/Part 1:** Write this in **pseudocode and JavaScript**. You just have to show me the written code, you do not have to implement it.

onHand < reOrdPt

noOrd =

reOrdPt -

onHand

Display/Show

noOrd

Display/Show

msg saying OK

**Help with flowchart:** The decision says onHand < reOrdPt

The first block on the right says noOrd = reOrdPt – onHand

The second block on the right says Display/Show noOrd – You can show the noOrd.

The block on the left says Display/Show the message that says OK.

**Problem #2/Part 2:** Write this in **pseudocode and JavaScript**. You just have to show me the written code, you do not have to implement it.

totAns =

totAns + ans

ct = ct + 1

ct < 5

**Problem #2/Part3:** Write this in **pseudocode and JavaScript**. You just have to show me the written code, you do not have to implement it and then answer the questions below.

totAns =

totAns +

ans

ct < 5

Input

ans

ct =

ct + 1

ct = 1

**Problem #2/Part4:** ComparePart 3 with the image below and answer the following questions:

1. Thoroughly explain the difference in the logic between Part2 and Part3.
2. If count was initialized at 6 what would happen in Part2?
3. If count was initialized at 6, what would happen in Part3?

totAns =

totAns +

ans

ct < 5

Input

ans

ct =

ct + 1

ct = 1

**Problem #3 OPTIONAL (15 points)**

Answer the following questions:

1. 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 the end of the loop.
2. If you want the code to determine whether or not you execute the loop at least once, should you put the condition at the beginning of the loop or the end of the loop?
3. (2 pts) If you have multiple if statements, how is it determined what if an else will attach itself to?
4. (3 pts) How do you code the statement condition1 and either condition2 or condition3. Show it in JavaScript.
5. What command can be used to convey information in a popup/alert in JavaScript?
6. 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
7. When you test a program that has successfully compiled with data, you are looking for \_\_\_\_\_\_\_ errors? Choose: A) syntax B) logic C) compiler 4) language
8. You use quotation marks to enclose. Choose: A) String or character constant/literal B) numeric constant/literal C) variable names D) string or character or numeric constant/literal.
9. (3 pts) All logic problems can be solved by using three structures. Identify the structures and explain their role in the program.
10. If you are reading a file and using end of file to tell you when to end the loop how do you control the loop and how do you progress through the file?

**Problem #4 REQUIRED (25 points)**

Your company gives a bonus to salespeople based on their total sales. The user enters the name of the salesperson and the total sales that the salesperson is credited with earning. You need to evaluate the total sales to calculate the bonus. Be sure that your output includes the calculated result along with the indicated bonus.

Bonus Information:

Total sales under 50,000 No bonus

Total sales between 50,001 and 100,000 1.5% bonus

Total sales between 100,001 and 500,000 3% bonus

Total sales over 500,000 5% bonus

You need to write and run this program in JavaScript.

You need to submit the program along with a screenshot showing the output. Remember: You can take a picture of the screen by pressing the PrtScn button on your keyboard and then pasting it below.

**Problem #5 REQUIRED (15 points)**

**Draw the logic flowchart or write the pseudocode to solve each of these problems. Be sure to use the appropriate mathematical symbols as well as omit any symbols that would not be included in actual code.**

1. You want to send a brochure to all people on your list who own a car that can seat 7 and either costs less than $25,000 or has a miles-per-gallon of 25 or more. Display the name for all of the people who met the aforementioned criteria.
2. Students make the honor roll if they are taking more than 4 classes, have a semester GPA greater than 3.5 and have an overall GPA of 3.0 or better. If they make the honor roll, display their name and the text “Congratulations!”. Otherwise, display their name and the text “Try harder”.
3. You want to check to see if a student is a CIS major who has taken either CIS120 or CIS122. If they have, then indicate to them that they are eligible to register for the Fall semester. Otherwise, they should meet with their advisor.

**Problem #6 OPTIONAL** (**15 points**) - Based on text and/or lectures.

**True/False:** *Indicate whether the sentence or statement is true or false.*

**If the question is false, either** **fix it or explain why it is false**. If you decide that it is true but feel you would like to clarify your decision, then please do so.

|  |  |
| --- | --- |
| **T or F** | **Question: Remember, if the question is false you must tell why!** |
|  | 1. Pseudocode is what a programmer includes within a program to provide additional information to other programmers viewing the code. |
|  | 2. Many programming languages support more specific numeric types such as int, single, double, float. |
|  | 3. A preselected value that stops the execution of a program is often called a dummy value (because real data is not used), where as a sentinel value represents an entry or exit point of a program. |
|  | 4. The statement **theRslt = theRslt + ptsEarned** means you want to take the contents of rheRslt, increase it by the contents of ptsEarned and assign the answer back to theRslt. |
|  | 5. Source code is written by the programmer using a programming language and object code is the code that is actually executed. |
|  | 6. **price - cost = profit** is a legal statement in programming. |
|  | 7. A message that asks a user for input is called an alert. |
|  | 8. It is typical for a declaration to include both the name and datatype of a variable. |
|  | 9. Both “someValue = 6” and “4 + 2 = someValue” are equivalent and valid statements. |
|  | 10. In a decision, if amt1 is not greater than amt2, it means that amt1 is less than amt2. |
|  | 11. The variable “myadditionresult” is an example of camel casing. |
|  | 12. Variable names can contain spaces in most languages.  |
|  | 13. Compiling can be used to find programming syntax errors and logic errors. |
|  | 14. 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. |
|  | 15. If you want the condition to end the loop to determine whether or not you execute the loop at least once, you should you put the condition at the beginning of the loop. |

**Problem #7 OPTIONAL (15 points)**

**Part #1:** Assume that you have received 5 numeric grades for the semester. Grades can range from 0 to 100. The first grade counts for 10% of you final grade. The second grade counts for 15% of your final grade. The third grade counts for 25% of your final grade. The fourth grade counts for 20% of your final grade. The fifth grade counts for 30% of your final grade. Calculate and display your final numeric grade. Write the algorithm to run this program.

|  |  |  |
| --- | --- | --- |
| **Input** | **Processing** | **Output** |
|  |  |  |

**Part #2:** Write the **psudocode or create a flowchart** that represents this program.

**Problem #8 OPTIONAL** (**12 points**)

Recreate the following image using the text and logo provided below.



**BCC Logo**



To utilize this image, right click on it and chose to “Save Picture As”.

**Page Text (found on pages 11 and 12)**

The TASC is dedicated to providing academic support for the entire BCC community. This support takes the form of providing one on one tutoring, small group tutoring through the Supplemental Instruction (SI) program, and computer instructional, audio-visual and written material. A major goal of the TASC is to help students develop independent learning skills in order to achieve their educational goals.

The TASC is a service of the Center for Developmental Education (CDE), which assists students at BCC to progress from their current level of educational proficiency to a level necessary to achieve their academic and career goals. This support takes the form of self-paced courses in reading, writing, and math, courses for those whom English is a second language, and support for those who have physical and learning disabilities. The TASC supports the needs of students in specific CDE courses as well as those from the College at large.

The overall philosophy of the TASC is based on the assumption that students learn in a variety of ways and at different speeds. The TASC, therefore, provides assistance through individual consultation, multi-media presentations, and computer-assisted instruction. Students coming to the TASC can avail themselves of trained personnel who are willing to work with them on an individual or small group basis. They can also work on their own utilizing the technology available. In other words, TASC personnel provide support and guidance to students. However, the emphasis is on student choice as to how that can be accomplished. In this way, students are helped to become more independent learners and to recognize that learning occurs in a variety of ways.

Another important element in the philosophy of the TASC is the reliance on peer tutors. While here are a number of professionals involved with the Center, the majority of tutors are currently enrolled students or those who have recently graduated. It is our feeling that students who need assistance will often feel more comfortable asking fellow students for help. It is important in this regard that tutors relate to tutees as fellow students. A tutor who projects a feeling of “superiority,” will soon turn off those whom they see to help. The concept of peer tutoring is well-established in the majority of colleges and universities in this country. Its success is based on the concept of “students helping students,” within an organized framework where tutors receive proper training and support.

**Problem #9 OPTIONAL** (**10 points**)

Use the a legible highlighter color to select your solution from the options on the right for each of the following problems.

|  |  |
| --- | --- |
| **Question #1:** You want to identify 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. 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:** The software that translates a high – level or source program into machine language is \_\_\_\_\_\_\_\_\_\_\_ ?  | A) compilerB) interpreterC) executerD) both compilerand interpreterapply |
| **Question #5:** 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 #6:** Calculating an answer and storing it to a named memory location is using a(n) \_\_\_\_\_\_\_\_\_\_\_\_ ?  | A) comparisonB) equalC) assignmentD) compiling |
| **Question #7: True or False:** You cannot execute a program to produce output if it has critical syntax errors.  | T) TrueF) False |
| **Question #8:** The three structures that define all programming logic are \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | A) selection, process, loopB) sequence, selection, loopC) sequence, iteration, loopD) sequence, repetition, case |
| **Question #9: 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 #10: 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 |