**The final test is due by 11:59pm on May 1 as advertised in the syllabus.**

**The test is 20 points. One point per question.**

This is a take-home test, but it is still a test. The full honor code will apply. For this test you must abide by the following rules for academic honesty.

You **MAY**:

* Find already existing sources at w3schools or any other website.
* Make use of any materials from Canvas or previous assignments

You **MAY NOT**

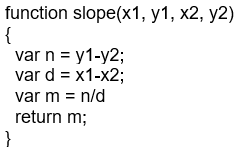
* Discuss the questions with your classmates or another person.
* Ask new questions on stackoverflow, quora, yahoo answers, etc.
* Give assistance to another student on this test.

By submitting this test and signing here I agree to abide by the honor code as applied to this assignment.

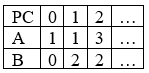
1. Convert the number into the other bases

|  |  |  |  |
| --- | --- | --- | --- |
| **Base-10** | **Base-2** | **Base 8** | **Base 16** |
|  |  |  | C1 |

1. Create a truth table for (A ∨ !C) ∧ (B ∧ C).
2. Describe the advantages of encoding a number as decimal vs. binary.
3. What is the purpose of a 'NIC' card?
4. Define these two terms as they apply to computer architecture: Processor and Memory.
5. Explain the way that the virtual machine provides a layer of abstraction.
6. Define the term “operating system”.
7. Suppose that in five years every financial transaction, every contract, every check you sign might require a digital signature from a RF ID chip embedded in your wrist. Give two examples of how your identity and privacy may be affected by this technology.
8. What level of the vulnerability pyramid do you have the most control over? How can your actions affect the security of the computers you use?
9. Name three things you can do to secure your personal information, bank account, or hand-held device.
10. Consider the code below that calculates the slope between two points. What kind of error might this function experience? Rewrite the code to include an appropriate try-catch.



1. Draw a table with registers A, B, and PC as rows. In each column from left show changes in the register values (see example below) until the program reaches the stop on line ***7***.

Solution will look like this: 

|  |  |
| --- | --- |
| **Memory#** | **Instruction** |
| 0 | Load ***8*** to A |
| 1 | Load ***9*** to B |
| 2 | A+B->A |
| 3 | B-1->B |
| 4 | if B=0 Jmp 6 |
| 5 | Jmp 2 |
| 6 | Write A to ***10*** |
| 7 | STOP |
| 8 | 7 |
| 9 | 3 |
| 10 |  |

1. Describe the test step of software development.
2. Name an advantage and a disadvantage of the agile programming paradigm.
3. How does the work of the System Administrator affect the work of the Developer? How does DevOps resolve this issue?
4. My car can tell me when I'm about to back over something, when I am too close to another car, when I am drifting out of my lane, and when my air pressure is getting low. Now the thing can even parallel park better than me. Is the car more intelligent than me? Explain your answer.
5. Describe (do no code) an algorithm to wash your clothes. Give a level of detail that a reasonably smart robot could follow.
6. Explain the importance of algorithmic efficiency in terms of memory.
7. I have two routes to travel from Dahlgren to Washington DC. One goes up I-95 and have heavy traffic at almost any hour of the day. One goes up Maryland 5 with no traffic at the right time of day but is longer. How is this travel decision related to algorithm efficiency?
8. Classify JavaScript as either a procedural, functional, object-oriented, or logical programming language. Justify your answer.