**CSCE 312 – Lab 1 Report**

**Texas A&M University**

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**Problem 1:**

1. **Tag 1:** This line of code is to check whether the text file successfully opened or not.

**Tag 2:** This line of code is to get current time of the day and save to variable this\_instant.

**Tag 3**: This line of code saves the output to the lab1\_prob1\_out.txt file, and it prints what the data type is and how many bits and how many bits long. And in this case, it using the data type int.

**Tag 4:** This line of code prints the output to console, and it prints what the data type is and how many bits and how many bits long. And in this case, it’s using the data type int.

1. A close up of a computer code

   Description automatically generated with medium confidence
2. The structure type of timeval got a variable name called tv\_sec with its data type of time\_t. Variable named tv\_sec got an data type of suseconds\_t.

**Problem 2:**

A screen shot of a computer code

Description automatically generated

1. A screenshot of a computer program

   Description automatically generated

A screen shot of a computer

Description automatically generated

1. 

The result shows that the data type of employee1 and employee2 were both 56 bytes or 448 bits long because of the memory alignment that came in place. Memory alignment depends on the complier and architecture. Where in my case, I had 64-bit type computer so it will align 8-byte boundaries each time, and since 50 and 52 were in the same chunk of 48~56 bytes, it will ended up that they used the same amount of memory.

**Problem 3:**

Truth table for BELL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DSBF | ER | DC | DLC | DOS | KIC | BP | CM | BELL |
| 1 | 1 | 1 | X | X | X | X | X | 0 |
| 1 | 1 | 0 | X | X | X | X | X | 1 |
| 1 | 0 | 1 | X | X | X | X | X | 0 |
| 1 | 0 | 0 | X | X | X | X | X | 0 |
| 0 | 1 | 1 | X | X | X | X | X | 1 |
| 0 | 1 | 0 | X | X | X | X | X | 1 |
| 0 | 0 | 1 | X | X | X | X | X | 0 |
| 0 | 0 | 0 | X | X | X | X | X | 0 |

Truth table for DLA

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DSBF | ER | DC | DLC | DOS | KIC | BP | CM | DLA |
| X | X | X | 1 | 1 | 1 | X | X | 1 |
| X | X | X | 1 | 1 | 0 | X | X | 1 |
| X | X | X | 1 | 0 | 1 | X | X | 0 |
| X | X | X | 1 | 0 | 0 | X | X | 1 |
| X | X | X | 0 | 1 | 1 | X | X | 0 |
| X | X | X | 0 | 1 | 0 | X | X | 0 |
| X | X | X | 0 | 0 | 1 | X | X | 0 |
| X | X | X | 0 | 0 | 0 | X | X | 0 |

Truth table for BA

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DSBF | ER | DC | DLC | DOS | KIC | BP | CM | BA |
| X | X | X | X | X | X | 1 | 1 | 1 |
| X | X | X | X | X | X | 1 | 0 | 0 |
| X | X | X | X | X | X | 0 | 1 | 0 |
| X | X | X | X | X | X | 0 | 0 | 0 |

1. BELL = ER \* (DSBF’ + DC’)

DLA = DLC \* (DOS + KIC’)  
BA = BP \* CM

1. A screen shot of a computer program

   Description automatically generated
2. A screen shot of a computer program

   Description automatically generatedA computer screen shot of text

   Description automatically generatedA screenshot of a computer

   Description automatically generated

**Problem 4:**

1. A computer screen shot of a program

   Description automatically generated
2. A screen shot of a computer

   Description automatically generated

**Problem 5:**

1. Compile time using the code from problem 3:

A screenshot of a computer

Description automatically generated

1. Compile time using the code from problem 4:

A computer code with black text

Description automatically generated

1. It seems like the code from problem 4 (bit masking) compiled faster than the code from problem 3, around 200 nano seconds faster.