**Name:** Hemant Kosaraju

Lab 1 (b): Problem 1

Subtract the following hexadecimal numbers 7ACD – 3AFE ?

For the first step D – E would result in -1 though we borrow 1 from C which changes from 12 to B = 11, then 1D – E = (1\*16 + 13) – 14 = 15 and in hexadecimal this value would be **F**

For the second step C – F which has now turned into B because of the borrow in the previous step makes the statement B – F while 11 – 15 is a negative value therefore borrow 1 from A which changes from 10 to 9, then 1B – F = (1\*16 + 11) – 15 = 12 and in hexadecimal this value would be **C**

For the third step A – A which has now turned into 9 because of the borrow in the previous step makes the statement 9 – A whilst 9 – 10 is a negative value therefore borrow 1 from 7 and this makes the subtraction to become 19 – A = (1\*16 + 9) – 10 = 15 and in hexadecimal this value would be **F**

For the final step 7 which has now become 6 because of the borrow 1, makes the statement 6 – 3 = 3 in hexadecimal it would be **3**

Therefore, the final answer for the subtraction of the question 7ACD – 3AFE = **3FCF**

|  |  |  |  |
| --- | --- | --- | --- |
| ~~7~~ 6 | ~~A~~ ~~9~~ 19 | ~~C~~ ~~B~~ 1B | ~~D~~ 1D |
| 3 | A | F | E |
| **3** | **F** | **C** | **F** |

Lab 1 (b): Problem 2

Convert 01110110 into 2’s complement form ?

01110110 into 1’s complement form would become

10001001 because the 0’s and 1’s would be inverse to its original

Now to get into 2’s complement from 1’s complement

10001001

+ 1 🡪 Add 1 to the 1’s complement

\_\_\_\_\_\_\_\_

10001010 🡪 This value is equal to 2’s complement by keeping the values before the last two values same representation as 1’s complement and altering the two ending values of the 1’s complement representation

Lab 1 (b): Problem 3

Subtract the following Octal numbers 765 – 377 ?

For the first step start with the right value, 5 – 7 in this statement 5 is less than 7 which indicates we have to borrow 1 from 6 and change the value of 6 to 5, then since these are Octal values we have to add 8 to 5 which would make the right value (5 + 8) = 13 – 7 = **6**

For the second step the 6 has become a 5 stated from the previous explanation, then the statement is 5 – 7 although because 5 is less than 7 we have to borrow 1 from 7 and change the value of 7 to 6, then add 8 to 5 which would make the value (5 + 8) = 13 – 7 = **6**

For the third step the 7 has become a 6 stated from the previous explanation, then the statement is 6 – 3 = **3**

Therefore, the final answer for the subtraction of the question 765 – 377 = **366**

|  |  |  |
| --- | --- | --- |
| ~~7~~ 6 | ~~6~~ 5 + 8 = 13 | ~~5~~ + 8 = 13 |
| 3 | 7 | 7 |
| **3** | **6** | **6** |