Assignment On Primitive Data type

1. Write a java program to count the number of bits that are set 1 in an integer. Also prove that time complexity is $O(n)$ where n is the number of bits.

2. Write a program to find the parity bit of a number in $O(n)$ time, where $n$is the word size.

3. Write a program to find the parity bit of a number in $O(k)$ time, where $k$is the number of set bits.

4. Write a program to find the parity bit of a number in $O(k)$ time, where $k$is the number of set bits.

5. Define a function to create a lookup table of size 2^16 whose value is the parity bits of the index.

6. Write a program to calculate the parity bit of a 64 bit word using look up table in $O(n/L)$ time, where n is the word size and L is the group size.
Note: Consider group size is 16 bit for the problem.

7. Write a program to calculate parity bit of a 64 bit word using only xor and right shift operator.

8. Write a program to swap the i^{th} bit with j^{th} bit of a number.

9. Design a function to create a lookup table A such that for every 16 bit number y, $A[y]$ holds the bit-reversal of y.

10. Write a program to find the bit reversal of a number using the lookup table created in Q9.

11. Write a program to find the closest integer with the same weight.

12. Write a program to compute XXY using bit wise operator.

13. Write a program to compute X/Y using bit wise operator.

14. Write a program to compute X^Y using bit wise operator.

15. Write a program to check if a decimal number is a palindrome.

16. Write a program which test if two rectangle have a nonempty intersection. If the intersection is nonempty, return the rectangle formed by their intersection.