SIKSHA 'O' ANUSANDHAN DEEMED TO BE UNIVERSITY

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Laboratory Record Computer Science Workshop 2 (CSE 3141)

Submitte	d	by
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Assignment on Burnetive Data Lypes

01) weite a preopean to count the number of bits that are sel 1 in an integer. Also forous that time complexity is O(n) where on is one number of bits. fullic class A1Q1 & fullic static void main (storing [] args) { int n= 11; int count = 0; system. out, fourth (Integer. to Biravy string (n)); entile (n:=0) 3 il ((n&1)==1) count ++: か= カン>フ 4; System out fourth (" the total number of 1s are "+ count); 3 as) weeth a freogram to find the fravily but of a number in O(n) time, where n is the word size. fullic class A1Q25 hublic static void main (String [] areas) { ent n = 15; system. oeit. frentlin (Integer. to Birary string (n)); int pacity = 0; while (n) =0) } faulty = faulty 1 (n 21);

1

Name: Fasuat Hohardy

Regd. Number: 194 101 2407

```
m= m>77 1;
    system.out. fourth ("Parety = "+ parety);
 3
83) write a powogram to find the posity bil of a number in
    O(K) time, where k is one number of set bets
fullic class A1Q33
  fullic static void main (string [] aregs) {
      int n = 10;
       int parity = 0;
       Septem. out. fruitte (Integral. to Burosey streng (m));
       while (n!=0) 3
          parity = of parity;
           m=m&(n-1);
       system. out frenth (parely);
OH) wente a program to find the partily bil of a number in
    O(10) time, where is it will runtive of set wits.
 fullic class AIR4 &
   fublic static void main (string [] orgs) &
       int n = 10:
       in parety = 0;
       system. out. fruntln (integer. to Binary string (n)):
       uhile (m!=0) 3
          parity = co parity;
                                        Regd. Number: 1941012407
       Name: Sasunt Just arty
                                  2
```

```
n= n2(n-1);
     System. out fourth (parity);
Z
as) define a function to vicate a lookup table of size 26 whose
   value is the parity bits of the index.
fublic class A1Q53
   fullic static void main (string [] args) }
      int partly - 0;
       unt [] lookuptable = new unt [64];
        for (unt l=0; l<64; l++) {
            ent n = i;
            entite (n; =0) 3
                 parity = parity 1 (n & 1);
                 n=n>>>71;
             2
            system.out. fruitte (ét " ->" + 2ntique. to Biraryzbeing (é)+
                                      " -> " + paretly);
         7
   3
66) weste a program to calculate the parity but of 64 but
    word using look up table in O(n/L) time, where n is the
   woodsize.
   Note: consider group size is 46 bit fore the foothern
```

```
import java. util. Scanner;
fullic class A1Q63
   fullic static void main (Sleing [] augs) &
       scarner input = new scarner (septem. in);
       int partly[] = new int [65536];
        lookup weater (parily);
       System. out. founder ("Entire the durany world unlose powerty
                            "(" betalvaled ");
         long x = input nextdorg ();
         in m = OXFFFF;
         int fort - parity [(int) (x>>48) & m] ^ parity [(int)
                          (x>> 30) & m] 1 parity [carl) (x>>16)
                          &m] ^ parity [cirt ) x & m];
         System. out. fruitle (" Parity of the entered number is;"
                                               + foct):
     9
     static lookuperector ( int parity [7) &
         for (int l=0; l<65536; l++) &
              unt r= 1;
              nc1 = x>>8;
              7 = x>>4;
              2c 1 = 2c >> 2;
              x1= x>>1;
             parity [1] = (x 21);
      2
```

4

Name: Sasurat Mohardy

Regd. Number: 1941018407

```
brow i'v 40 a for grand etalulate parity bil of a 64 vit word
     using only XOR and sught shift aprecator
unpost java util scanner;
fublic class 11973
   hubbic static void main (thring [] args) &
      Scanner input = new scanner (System. in);
      system out punten ("Enter the number unhose parcety but is
                            to be calculated: );
       long x = input. next song ();
       x^ = x >7 3a;
       x1 = x7716;
        · な 1 = x >> も;
        21 = 2774!
        x^= x >> 2;
        x1=x>71;
        Septem out fourth (" Pariety is: "+ (x & 1));
   3
a for but of a time teel and alone it well if the but of a
   number.
import java. utel, scanner;
fullic class A198 3
  fublic static void main (string[] augs) {
      scarner input - new scarner (system. in);
     system. out. fourth ("Entire the number: ");
     end n = inful. next and ();
     system. out. fruntle (Integer. to Binary String (n));
      Name: Sowat Moharde
                                       Regd. Number: 1941012407
                                  5
```

```
system. out. fourth ("Enter the fositions to swap: ");
   unt i = infut. next ant ();
    int j= unful, nextant();
    $ C(18cn>72) != (18cn>71))>2
        int bit Mask = (1<x2)/(1<</);
         n n= bet Mask;
     system. out. frentln ( Integer. to Burary String (m));
  3
Ba) design a function to evente a lookup table A such that for
   every 16 bet number y, ATY] holds the Jul-survesal of y.
static void reversallookup (int lookup II) {
   fore (int i=0; i < 65536; l++) {
      und n= i;
      int x = 0;
       merile (7>0) 3
          st <<=1;
          if ( (m s 1) == 1)
               or 1=1;
          m >> =1;
      lookup [2] = x;
3
```

Name: Saswal Mohanty

```
one selmen a for every the but brug at number using
     the lookup table verated in 09.
unposet java. util. scanner;
fullic class A1Q103
  static void reversal bookup (unt lookup []) &
      for (int 1=0; 1<65536; 1++) {
           unt n= 2;
            int & = 0;
            while (n>0) g
                96<<=1
                 if ((n21)==1)
                      st 1= 1;
                 n >>=1:
             lookuh [i] = x:
        3
   3
    fullie statie void main (string [] augs) ?
       scarrer infut = new scarrer (system. in);
       unt lookup [] = new unt [65536];
       reversal lookup ( lookup);
       System. out . fountln ("Entire the number whose but suversal
                             ("betalulas si est
       unt n = inful resolant ();
        if (n>= 65936)
            system, out, frentln ("The entered number is outside
                                  the starge of the lookup table);
        elee
           system. out. fruntte (lookeef [m]);
   3
```

Ŧ

Name: Saswot Mohanty

Regd. Number: 1941012407

```
Agieur ence retien ropetre tereals et brif et margary a etireur (110
fublic class A1Q11 3
   public static void main (string (Jargs) &
      long b=67;
      long y = closest (b);
       system.out, fourth (y);
   static long closest (long b) {
       for (unt e=0; l<63; e+1) {
           if (((p>>)i) & 1)!= ((p>>)(i+1)) & 1)) &
                 b = (1<< i) | (1<< (i+ 1));
                 outwo p;
            3
        return long. MIN_VALUE;
explaints a freguen to compute $ $ y using but were operator.
fullic class A1Q12 2
  fullic static void main (string [] aregs) {
       system. out. fourth ( multiply (p,y));
    static long Add (long p, long y) {
        while (y!=0) {
            long cavey = pry;
             b = 6 %;
                                       Regd. Number: 1941012407
       Name: Saswat Moharity
```

8

```
y = carry << 1;
     seturn p;
   static long nuttiply (long p, long y) {
        long sum =0;
         mhile ( p!=0) }
             il (cp 84)! =0) {
                  sum= Add csum, y);
                  b >>=1;
                  y Lc = 1;
               setwen sem;
013) wente a perogram to compute x/y using vit use operatore.
import java, util, scarror;
fullic class A1Q132
  public static void main (string [] args) &
       Scarner infut = new scarner (System. in);
        system, out, fourth ("Enter the numbers: ");
       int a = infut, next ant ();
       int b = infut. next 2nd();
        int t=0, q=0;
        fore ( unt e=0; a>= b; e++) &
           if ((b<<i)>a) {
q = (1 << (i-1));
     Name: Samuel Mohanty
                                      Regd. Number: 1941012407
                                q
```

```
a== ( b << ( e- 4));
             e = -1;
     system.out. fountln (q);
3
814) usute a frogram to compute x using but wise operator.
import java. util. scanner;
fullic class A1Q14 &
   fullic static void main (string [ augs) {
       Scanner infut = new scanner (system. in);
       System, out, fruntly ("Enter the numbers: ");
       int x = infut, nextant ();
       int y = whut nextant ();
       unt Hes = 1;
       while (y'=0) g
          · if ((481) == 1)
                  JUS *= 2;
            父朱二 父;
             4>>=1;
         System. out . fourth (ves);
    3
3
015) write a foregram to check if a decimal number is a pallindrome
(* . l'alu. avio fragme
fullic class A1Q15 &
  public static void main (string [] augs) q
      Name Saswat Mohanty
                                       Regd. Number: 1941013407
                                  10
```

```
Scanner input = new scanner (system. in);
     System. out. fruntly ("Enter the number: ");
      int m = infut , neschart ();
      int nod= (int) Math. fig10(n) +1;
      System. out. fourth (nod);
       int med = (int) Math pour (10, nod -1);
        System. out, fourth (med);
       unile (n!=0) 9
           System.out. fourth ((n/msd)+" "+(n % 10));
            if ((n/msd) != (no/ 10)) 3
                 system. out. fountln ("Entered number és not
                                          pallindrome. ");
                  system. exit (-1);
              9 % = msd;
              n/= 10;
              msd /= 100;
              system. oect. freutln (n);
          system. out. frentln ("Entwed number is pallinderone,"),
   write a foregrow that tests if two ouclargle have a non-
   enfty intresection. If the intresection is non-empty return
   the seedingle found by their intersection.
fublic class A1Q169
  fullic static void main (sleing [] augs) &
      Rectargle 991 = new Rectargle (1,8, 10, 13);
      Rectargle ra = new Rictargle (6, 2, 12, 22);
       boolean interesected (ses, rea);
     Name: Baswat Mohanty
                               11
                                     Regd. Number: 1941012407
```

```
System. out. frunten (untursected Res);
 slatic replean is intersected ( rectangle R1, Rectangle R3) &
      return R1, pour <= R2, pour +
              R, width && RD. poor <= R1. pour +
              R1. molt 82 R1. y cor <= R2. y cor +
              Ra, height & & Rd, year <= R1. year + R1. height;
   3
3
class Rectangle 3
   unt paor, y cor =0; double width, height = 0;
    Rectargle (int p, int y, double worden, double height) 3
         poor = p;
          year = y;
        this, width = width;
        this . height = height;
```