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```

# 1 Graph

#### 1.1 C129

```
1 #include <bits/stdc++.h>
3 using namespace std;
4 char oil[100][100] = {0};
5 int m, n;
6
7 void dfs( int i, int j )
8 {
9
       oil[i][j] = '*';
       if( oil[i-1][j-1] == '@' )
10
11
           if(i-1 >= 0 \&\& j-1 >= 0)
12
13
                oil[i-1][j-1] = '*';
14
15
                dfs( i-1, j-1 );
16
17
       else if( oil[i-1][j] == '@' )
18
19
20
           if( i-1 >= 0 )
21
           {
22
                oil[i-1][j] = '*';
                dfs( i-1, j );
23
24
       }
25
       else if( oil[i-1][j+1] == '@' )
26
27
           if( i-1 >= 0 && j+1 <= n )</pre>
28
29
           {
                oil[i-1][j+1] = '*';
30
31
                dfs( i-1, j+1 );
32
33
34
       else if( oil[i][j-1] == '@' )
35
36
            if( j-1 >= 0 )
37
38
                oil[i][j-1] = '*';
39
                dfs( i, j-1 );
           }
40
41
       else if( oil[i][j+1] == '@' )
42
43
44
           if( j+1 <= n )
45
           {
46
                oil[i][j+1] = '*';
47
                dfs( i, j+1 );
48
49
50
       else if( oil[i+1][j-1] == '@' )
```

```
51
          {
              if( i+1 \le m \&\& j-1 \ge 0 )
  52
  53
                   oil[i+1][j-1] = '*';
  54
1
  55
                   dfs( i+1, j-1 );
  56
         }
  57
  58
         else if( oil[i+1][j] == '@' )
  59
              if( i+1 <= m )
  60
2
  61
                   oil[i+1][j] = '*';
  62
3
  63
                   dfs( i+1, j );
  64
  65
         }
         else if( oil[i+1][j+1] == '@' )
  66
  67
  68
              if( i+1 <= m && j+1 <= n )</pre>
  69
              {
                   oil[i+1][j+1] = '*';
  70
                   dfs( i+1, j+1 );
  71
  72
         }
  73
  74
     }
  75
     int main(void)
  76
  77
          while( cin >> m >> n )
  78
  79
  80
               int ans = 0;
              if(( m == 0 ) && ( n == 0 ))
  81
  82
  83
                   break:
  84
              }
  85
               else
  86
  87
                   for( int i = 0 ; i < m ; i++ )</pre>
  88
                        for(int j = 0 ; j < n ; j++ )</pre>
  89
  90
                             cin >> oil[i][j];
  92
                   }
  93
  94
              for( int i = 0 ; i < m ; i++ )</pre>
  95
  96
  97
                   for(int j = 0 ; j < n ; j++ )</pre>
  98
                   {
                        if( oil[i][j] == '@' )
  99
 100
                        {
 101
                             dfs( i, j);
 102
                             ans++;
 103
                        }
 104
                   }
              }
 105
              cout << ans <<endl;</pre>
 106
          }
 107
 108
          return 0;
 109 }
```

1

# 1.2 11935

```
1 | #include <bits/stdc++.h>
3
  using namespace std;
  int main()
6
  {
7
       int num, flag = 1;
       cin >> num;
       while( num > 0 )
9
10
           int n, ans = 0;
11
12
           char map[100][100] = {0};
           cin >> n;
13
           for( int i = 0 ; i < n ; i++ )</pre>
14
```

```
15
             {
                  for(int j = 0 ; j < n ; j++ )</pre>
16
17
18
                       cin >> map[i][j];
19
20
             for( int i = 0 ; i < n ; i++ )</pre>
21
22
                  for(int j = 0 ; j < n ; j++ )</pre>
23
24
                       if( map[i][j] == 'x' )
25
                       {
26
27
                            ans++;
                       }
28
29
                  }
             }
30
31
             cout << "Case " << flag << ": " << ans <<endl;</pre>
32
             num - -:
             flag++;
33
34
35
        return 0;
36 }
```

#### 2 Numbers

## 2.1 CongruenceEquation

```
1 #include <bits/stdc++.h>
2
  using namespace std;
5
  long long Mode(long long a, long long n, long long m)
6 {
7
       long long sum = 1;
8
       for( ; n ; n >>= 1 )
9
10
           if( n & 1 )
11
           {
12
                sum = (sum * a) % m;
13
           a = (a * a) % m;
14
15
16
       return sum;
17 }
18
19 int main(void)
20 {
21
       int a, b, p, x, ans = 0;
22
       cin >> a >> b >> p >> x;
23
       for( int i = 1 ; i < x + 1 ; i++ )</pre>
       {
24
25
           int n;
26
           n = i \% p;
27
           n = n * Mode(a, i, p);
           if( n % p == b % p )
28
29
           {
                ans++;
30
           }
31
32
       cout << ans <<endl;</pre>
33
34
       return 0;
35 }
```

#### 3 **JAVApractice**

#### practice1

```
1 package com.company;
 import java.util.Scanner;
3
 public class Main {
```

```
public static void main(String[] args) {
           Scanner scanner = new Scanner(System.in);
           int n = scanner.nextInt();
           int m = n-1;
           for( int i = 1 ; i <= 2*n-1 ; i=i+2 ) {</pre>
               for( int j = m ; j > 0 ; j-- ) {
                   System.out.print(" ");
               }
               m - -;
               for (int t = 0; t < i; t++) {
                   System.out.print("*");
               System.out.println();
           }
      }
21 }
```

## 3.2 emirp

5

6

7

8

9

10

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12

13

14

15

16

17

18

19

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2

3

5

6

7 8

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10

11

12

13

14

15

16

17

18

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41

42

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44

45 46

47 48 49

50

51

52

53

```
1 import java.lang.Math;
 public class Main {
      private static boolean prime ( int number){
          for (int i = 2; i <= Math.sqrt(number); i++)</pre>
              if (number % i == 0)
              {
                   return false;
              }
          }
          return true;
      private static boolean palindrome ( int number){
          String numstr = number + "";
          int left = 0;
          int right = numstr.length() - 1;
          while (left < right) {</pre>
              if (numstr.charAt(left) !=
                  numstr.charAt(right)) {
                   return true;
              }
              left++;
              right--;
          return false;
      public static int reverse(int num){
          int tot = 0, buf = 1;
          boolean jud = true;
          while (num > 0) {
              tot = tot * buf + (num % 10);
              num /= 10;
              if(jud) buf *= 10;
              jud = false;
          }
          return tot;
     }
      public static void main(String[] args) {
          int flag = 0, num = 120;
          for (int i = 2; i < 100000; i++) {
              if (palindrome(i) && flag < num) {</pre>
                  if (prime(i) && prime(reverse(i))) {
                       System.out.print(i);
                       flag++;
                       if (flag % 10 == 0) {
                           System.out.println();
                       if (flag % 10 != 0 && flag !=
                           num) {
                           System.out.print(" ");
                       if (flag == num && flag % 10 !=
                           0) {
```

```
標題二
                                                           標題-
54
                           System.out.println();
                       }
55
                   }
56
              }
57
           }
58
      }
59
60 }
  3.3
         practice3
1 package com.company;
2
  import java.util.Scanner;
  public class Main {
3
5
       public static void main(String[] args) {
6
           Scanner scanner = new Scanner(System.in);
```

```
7
            int n = scanner.nextInt();
            if( n >= 2 ){
8
9
                 System.out.print(2);
10
            }
11
            for (int j = 3; j < n; j++)
12
13
                 boolean answer = true;
14
                for (int i = 2; i <= Math.sqrt(j); i++)</pre>
15
16
                     if (j % i == 0)
17
                     {
18
                          answer = false;
19
                          break;
                     }
20
21
                if (answer)
22
23
                {
24
                     System.out.print( " "+ j );
25
26
            }
27
28
            System.out.println();
29
       }
```

#### 3.4 practice4

30 }

```
1 package com.company:
2 import java.util.Scanner;
  public class Main {
3
       private static String str;
5
       public static void main(String[] args) {
           Scanner scanner = new Scanner(System.in);
6
7
           while( scanner.hasNext() ) {
8
                str = scanner.next();
9
                if(str.equals("0")){
10
                    break;
11
12
                int tot1 = 0, tot2 = 0;
                for (int i = 0; i < str.length(); i += 2)</pre>
13
                    tot1 = tot1 + str.charAt(i) - '0';
14
15
               }
16
                for (int j = 1; j < str.length(); j += 2)</pre>
17
                    tot2 = tot2 + str.charAt(j) - '0';
                }
18
19
                if( tot1 > tot2 ){
20
                    judgment( tot1, tot2 );
21
                }
22
                else{
                    judgment( tot2, tot1 );
23
                }
24
25
           }
26
27
       public static void judgment( int a, int b ){
28
```

```
29
           int judge = a - b;
           if( judge % 11 == 0 ){
30
                System.out.println( str +" is a multiple
31
                    of 11.");
32
           }
33
           else{
               System.out.println( str +" is not a
34
                    multiple of 11." );
           }
35
36
       }
37 }
```

#### 3.5 HW1

6

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30 31

32

33

34 35

36

37

38

39 40

41

42

43

44 45

46 47

48

49

50

51

52

53

54

```
1 package com.company;
  import java.math.BigDecimal;
  import java.util.Scanner;
  import java.util.StringTokenizer;
  public class Main {
      public static void main(String[] args) {
           Scanner scanner = new Scanner(System.in);
           String str = scanner.next();
           BigDecimal ans = new BigDecimal(0);
           String[] num = new String[50];
           String[] sign = new String[50];
           int flag = 0, flagg = 0;
           StringTokenizer token = new
               StringTokenizer(str, "+-*/%,()",true);
           while(token.hasMoreTokens()){
               String str1 = token.nextToken();
               if( Character.isDigit(str1.charAt(0))){
                   num[flag] = str1;
                   if( flag > 0 ){
                       System.out.print(" ");
                   System.out.print(num[flag]);
                   flag++;
               }
               else{
                   sign[flagg] = str1;
                   flagg++;
           System.out.println();
           for(int i = 0 ; i < sign.length ; i++ ){</pre>
               if(sign[i] == null){
                   break;
               }
               else if(i > 0){
                   System.out.print(" ");
               System.out.print(sign[i]);
           System.out.println();
           for( int i = 0 ; i < num.length ; i++ ){</pre>
               if( num[i] == null ){
                   break;
               BigDecimal cal = new BigDecimal(num[i]);
               ans = ans.add(cal);
           System.out.printf("%.3f",ans);
           System.out.println();
      }
55 }
```

#### 3.6 primenumber

```
1 package com.company;
2 import java.lang.Math;
3 import java.util.Scanner;
5
  public class Main {
       public static void main(String[] args) {
6
7
           Scanner scanner = new Scanner(System.in);
8
           int num = scanner.nextInt();
9
           int[] arr = new int[1000];
10
            int flag = 0;
11
           for (int j = 2; j < num ; j++)
12
           {
13
                boolean answer = true;
                for (int i = 2; i <= Math.sqrt(j); i++)</pre>
14
15
                    if (j % i == 0)
16
17
                    {
18
                         answer = false;
19
                         break:
20
                    }
21
22
                if (answer)
23
                    arr[flag] = j;
24
25
                    flag++;
                }
26
27
28
           for(int i = 0 ; i < flag ; i++){</pre>
29
                int temp = i+1;
30
                System.out.print(arr[i]);
                if( temp % 10 != 0 && i != flag -1){
31
32
                     System.out.print(" ");
33
                }
34
                if( i == flag -1 && temp % 10 != 0){
35
                    System.out.println();
36
37
                }
38
                if( temp % 10 == 0){
39
40
                    System.out.println();
                }
41
42
           }
43
       }
44 }
```

#### 3.7 palindromeprime

```
1 package com.company;
2 import java.util.Scanner;
  import java.lang.Math;
  public class Main {
5
6
       private static boolean prime ( int number){
7
           for (int i = 2; i <= Math.sqrt(number); i++)</pre>
8
                if (number % i == 0)
9
10
                {
11
                    return false;
12
                }
           }
13
14
           return true;
15
       private static boolean palindrome ( int number){
16
17
           String numstr = number + "";
18
            int left = 0;
           int right = numstr.length() - 1;
19
20
           while (left < right) {</pre>
                if (numstr.charAt(left) !=
21
                    numstr.charAt(right)) {
22
                    return false;
23
                left++;
24
25
                right --;
26
27
            return true;
       }
28
```

```
29
       public static void main(String[] args) {
30
           Scanner scanner = new Scanner(System.in);
31
           while (scanner.hasNext()) {
32
               int num = scanner.nextInt();
33
                int flag = 0;
                for (int i = 2; i < 100000; i++) {
34
35
                    if(num == 0){
36
                         System.out.println();
37
                         break;
38
39
                    if (palindrome(i) && flag < num) {</pre>
40
41
                         if (prime(i)) {
42
                             System.out.print(i);
43
                             flag++;
                             if (flag % 10 == 0) {
44
45
                                  System.out.println();
46
47
48
                             if (flag % 10 != 0 && flag !=
                                  num) {
49
                                  System.out.print(" ");
50
51
                             if (flag == num && flag % 10
52
                                  != 0) {
                                  System.out.println();
                             }
54
55
                        }
56
                    }
               }
57
58
           }
59
       }
60 }
```

#### 3.8 magicsquare

標題一

```
1 package com.company;
  import java.util.Scanner;
3
4
  public class Main {
       public static void main(String[] args) {
5
           Scanner scanner = new Scanner(System.in);
7
           while(scanner.hasNext()){
8
               int n = scanner.nextInt();
9
               if (n % 2 == 0){
                    System.out.println("It is not an odd
10
                        number.");
                    if(scanner.hasNext()){
11
12
                        System.out.println();
                   }
13
14
                    continue:
15
               }
               int sum = (n * ((n * n) + 1))/2;
16
17
               System.out.println(sum);
18
               long[][] square = new long[n][n];
19
20
               int row = n-1;
               int col = n/2;
21
22
               square[row][col] = 1;
               for (long i = 2; i \le n*n; i++) {
23
24
                    if (square[(row + 1) % n][(col + 1) %
                        n] == 0) {
                        row = (row + 1) % n;
25
26
                        col = (col + 1) % n;
                   }
27
28
                        row = (row - 1 + n) \% n;
29
30
31
                    square[row][col] = i;
32
33
               for (int i = 0; i < n; i++) {
34
35
                    for (int j = 0 ; j < n ; j++) {
                        System.out.printf("%5d",
36
                            square[i][j]);
```

```
37
                                                                   63
                                                                                    if(A[max[i]]){
                                                                                        System.out.println(max[i]);
38
                     System.out.println();
                                                                   64
                                                                   65
                                                                                   }
39
                if(scanner.hasNext()){
                                                                                    else{
40
                                                                   66
41
                     System.out.println();
                                                                   67
                                                                                        System.out.println(PrimeFactorization(max[i]));
42
                                                                   68
            }
                                                                   69
                                                                               }
43
44
       }
                                                                   70
                                                                          }
45 }
                                                                   71 }
```

3

6

8

9

# primefactorization

1 import java.util.Scanner;

#### 3 public class Main { private static boolean[] PrimeArray(long N){ 4 5 boolean[] A = new boolean[(int)N+1]; 6 A[0] = true:7 A[1] = true; for(long j = 2; j <= N ; j++) { 8 boolean judge = true; for (int i = 2; i <= Math.sqrt(j); i++) {</pre> 10 if (j % i == 0) { 11 10 12 judge = false; A[(int) j] = false; 13 14 12 } 15 13 16 17 if(judge){ 18 A[(int)j] = true; 19 15 } 20 16 21 return A; 17 22 18 private static String PrimeFactorization(long N){ 23 19 String str = ""; 24 20 boolean jud = false; 25 21 for(long i = 2; N > 1; i++) { 26 22 int flag = 1; 27 23 $if(N \% i == 0) {$ 28 24 29 if(jud) { str = str + " \* "; 30 25 31 32 N = N / i;26 33 str = str.concat(Long.toString(i)); 27 34 jud = true; 28 while (N % i == 0) { 35 29 36 N = N / i; 30 flag++; 37 31 38 32 if(flag > 1){ 39 33 str = str + "^"; 40 34 41 str.concat(Long.toString(flag)); 36 42 } 37 } 43 38 } 44 39 45 return str; 40 46 41 47 public static void main(String[] args) { Scanner scanner = new Scanner(System.in); 48 49 int maxn = 0, flag = 0; 50 int[] max = new int[1000]; 51 while(scanner.hasNextInt()){ 52 int N = scanner.nextInt(); max[flag] = N; 53 54 if(max[flag] > maxn){ 55 maxn = max[flag]; 56 57 flag++; 58 System.out.print(maxn + " "); 59

System.out.printf(" $%d \ n$ ",

(int)Math.sqrt(maxn));

boolean[] A = PrimeArray(maxn);

for(int i = 0 ; i < flag ; i++){</pre>

60

61

62

#### 3.10 calendar

```
1 import java.util.Scanner;
 public class Main {
      public static void main(String[] args) {
          Scanner scanner = new Scanner(System.in);
          String[] month =
              {"January", "February", "March", "April", "May", "June",
          int year = scanner.nextInt();
          int d = scanner.nextInt();
          int t = 0;
          boolean leap = (year % 4 == 0 && year % 100
              != 0) || year % 400 == 0;
          for(int i = 0; i < 12; i++) {
              System.out.println('
                  month[i] + " " + year);
              System.out.print("--
                  Sun Mon Tue Wed Thu Fri Sat\n");
              if( d == 7){
                  d = 0:
              }
              t = 0;
              for(int j = 0; j < d; j++){
                  System.out.print("
                  t++;
              int day, nd = 1;
              switch(i+1){case 4: case 6: case 9: case
                  11: day = 30; break;
                  case 2: if(leap){day = 29;}else{day =
                      28;}break;
                  default: day = 31;break;}
              while(nd <= day){</pre>
                  if(t % 7 == 0 && t != 0) {
                      System.out.println();
                  System.out.printf("%4d", nd);
                  nd++;
                  t++;
              }
              System.out.println();
              d = t;
              if(i != 11)
                  System.out.println();
          }
     }
```

# 3.11 latinsquare

```
1 import java.util.Scanner;
  public class Main {
2
3
      public static void main(String[] args) {
          Scanner scanner = new Scanner(System.in);
          int num, white = 0;
7
          if(( num= scanner.nextInt()) > 0 )
8
9
               int[] latin = new int[26];
10
              String[][] square = new String[num][num];
```

```
11
                     ={ "A", "B", "C", "D", "E", "F", "G", "H", "I", "J74,
12
                int flag = 0;
                                                                  75
                boolean ha = true;
13
                                                                  76
                for(int i = 0 ; i < num ; i++)</pre>
14
                                                                  77
15
                {
                                                                  78
                     int flagg = 0;
                                                                  79
16
17
                     while( scanner.hasNext() && flagg <</pre>
                                                                  80
                                                                  81
                         num)
18
19
                         square[i][flagg] = scanner.next();
                                                                  83
                         if((square[i][flagg].charAt(0) -
20
                                                                  84
                              '0') >
                              (eng[num].charAt(0)-'0')){
                                                                  85
21
                              System.out.printf("Wrong
                                                                  86
                                   input: the letters must
                                   be from %s to %s\n",
                                                                  87
                                   eng[0], eng[num-1]);
                                                                  88
                              ha = false;
                                                                  89
22
23
                              break;
                                                                  90
                                                                              }
                                                                          }
                                                                  91
24
25
                         flagg++;
                                                                  92 }
26
                     if(flagg != num && ha){
27
28
                         System.out.printf("Wrong input:
                              you need to enter exactly %d
                              letters\n", num);
                         ha = false;
29
30
                         break;
31
                     flag++;
32
33
                if(flag != num && ha){
34
35
                     System.out.printf("Wrong input: you
                         need to enter exactly %d
                         letters\n", num);
36
                     ha = false;
                }
37
38
                if(ha) {
                     int rl = 0;
39
                     for (int i = 0; i < num; i++) {</pre>
40
41
                         int[] row = new int[26];
                         for (int j = 0; j < num; j++) {</pre>
42
43
                              for (int t = 0; t < 26; t++) {
44
                                  if
                                       (square[i][j].equals(eng[t]))
                                       row[t]++;
45
46
                                       latin[t]++;
                                  }
47
48
                              }
49
                         for (int s = 0; s < 26; s++) {
50
51
                              if (row[s] > 1) {
                                  rl++;
52
53
                         }
54
55
56
                     int cl = 0;
                     for (int i = 0; i < num; i++) {</pre>
57
58
                         int[] column = new int[26];
                         for (int j = 0; j < num; j++) {
59
                              for (int t = 0; t < 26; t++) {
60
61
                                  if
                                       (square[j][i].equals(eng[t]))
                                       column[t]++;
62
63
64
                              for (int s = 0; s < 26; s++) {
65
66
                                  if (column[s] > 1) {
67
                                       cl++;
68
                              }
69
                         }
70
71
72
                     int lc = 0;
```

```
6
    for (int i = 0; i < 26; i++) {
        if (latin[i] > 0) {
                                            , "Y", "Z"
            lc++;
    if (white != 0) {
        System.out.println("");
    if (rl == 0 && cl == 0 && lc == num) {
        System.out.println("The input
            array is a Latin square");
    } else {
        System.out.println("The input
            array is not a Latin square");
    white++;
}
```