Contents

1 Graph

1.1 C129

```cpp
#include <bits/stdc++.h>

using namespace std;
char oil[100][100] = {0};
int m, n;

void dfs( int i, int j )
{
    oil[i][j] = '*';
    if( oil[i-1][j-1] == '@' )
    {
        if( i-1 >= 0 && j-1 >= 0 )
        {
            oil[i-1][j-1] = '*';
            dfs( i-1, j-1 );
        }
    }
    else if( oil[i-1][j] == '@' )
    {
        if( i-1 >= 0 )
        {
            oil[i-1][j] = '*';
            dfs( i-1, j );
        }
    }
    else if( oil[i-1][j+1] == '@' )
    {
        if( i-1 >= 0 && j+1 <= n )
        {
            oil[i-1][j+1] = '*';
            dfs( i-1, j+1 );
        }
    }
    else if( oil[i][j-1] == '@' )
    {
        if( j-1 >= 0 )
        {
            oil[i][j-1] = '*';
            dfs( i, j-1 );
        }
    }
    else if( oil[i][j+1] == '@' )
    {
        if( j+1 <= n )
        {
            oil[i][j+1] = '*';
            dfs( i, j+1 );
        }
    }
    else if( oil[i+1][j-1] == '@' )
    {
        if( i+1 <= m && j-1 >= 0 )
        {
            oil[i+1][j-1] = '*';
            dfs( i+1, j-1 );
        }
    }
    else if( oil[i+1][j] == '@' )
    {
        if( i+1 <= m )
        {
            oil[i+1][j] = '*';
            dfs( i+1, j );
        }
    }
    else if( oil[i+1][j+1] == '@' )
    {
        if( i+1 <= m && j+1 <= n )
        {
            oil[i+1][j+1] = '*';
            dfs( i+1, j+1 );
        }
    }
}

int main(void)
{
    while( cin >> m >> n )
    {
        int ans = 0;
        if(( m == 0 ) && ( n == 0 ))
        {
            break;
        }
        else
        {
            for( int i = 0 ; i < m ; i++ )
            {
                for(int j = 0 ; j < n ; j++ )
                {
                    cin >> oil[i][j];
                }
            }
        }
        for( int i = 0 ; i < m ; i++ )
        {
            for(int j = 0 ; j < n ; j++ )
            {
                if( oil[i][j] == '@' )
                {
                    dfs( i, j);
                    ans++;
                }
            }
        }
        cout << ans <<endl;
    }
    return 0;
}
```

1.2 11935

```cpp
#include <bits/stdc++.h>

using namespace std;

int main()
{
    int num, flag = 1;
    cin >> num;
    while( num > 0 )
    {
        int n, ans = 0;
        char map[100][100] = {0};
        cin >> n;
        for( int i = 0 ; i < n ; i++ )
        {
```

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

2 Numbers

2.1 CongruenceEquation

```cpp
1  #include <bits/stdc++.h>
2
3  using namespace std;
4
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         }
14         a = ( a * a ) % m;
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++ )
24     {
25         int n;
26         n = i % p;
27         n = n * Mode( a, i, p);
28         if( n % p == b % p )
29         {
30             ans++;
31         }
32     }
33     cout << ans <<endl;
34     return 0;
35 }
```

3 PD practice

3.1 practice1

```java
1  package com.company;
2  import java.util.Scanner;
3  public class Main {
4
5      public static void main(String[] args) {
```

```java
6          Scanner scanner = new Scanner(System.in);
7          int n = scanner.nextInt();
8          int m = n-1;
9          for( int i = 1 ; i <= 2*n-1 ; i=i+2 ) {
10             for( int j = m ; j > 0 ; j-- ) {
11                 System.out.print(" ");
12             }
13             m--;
14             for (int t = 0; t < i; t++) {
15                 System.out.print("*");
16             }
17             System.out.println();
18         }
19
20     }
21 }
```

3.2 practice2

```java
1  package com.company;
2
3  public class Main {
4
5      public static void main(String[] args) {
6          for( int i = 1 ; i < 10 ; i++ ) {
7              for( int j = 1 ; j < 10 ; j++ ) {
8                  System.out.print( i+ " * "+ j+ " =");
9                  if( i * j < 10 ){
10                     System.out.print("  ");
11                 }
12                 else{
13                     System.out.print(" ");
14                 }
15                 int ans = i * j;
16                 if( j == 9 )
17                 {
18                     System.out.print(ans);
19                 }
20                 else
21                 {
22                     System.out.print( ans+ " " );
23                 }
24             }
25             System.out.println();
26         }
27
28     }
29 }
```

3.3 practice3

```java
1  package com.company;
2  import java.util.Scanner;
3  public class Main {
4
5      public static void main(String[] args) {
6          Scanner scanner = new Scanner(System.in);
7          int n = scanner.nextInt();
8          if( n >= 2 ){
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++)
15             {
16                 if (j % i == 0)
17                 {
18                     answer = false;
19                     break;
20                 }
21             }
22             if (answer)
```

```
23          {
24              System.out.print( " "+ j );
25
26          }
27      }
28      System.out.println();
29  }
30 }
```

3.4 practice4

```
1  package com.company;
2  import java.util.Scanner;
3  public class Main {
4      private static String str;
5      public static void main(String[] args) {
6          Scanner scanner = new Scanner(System.in);
7          while( scanner.hasNext() ) {
8              str = scanner.next();
9              if(str.equals("0")){
10                 break;
11             }
12             int tot1 = 0, tot2 = 0;
13             for (int i = 0; i < str.length(); i += 2)
                   {
14                 tot1 = tot1 + str.charAt(i) - '0';
15             }
16             for (int j = 1; j < str.length(); j += 2)
                   {
17                 tot2 = tot2 + str.charAt(j) - '0';
18             }
19             if( tot1 > tot2 ){
20                 judgment( tot1, tot2 );
21             }
22             else{
23                 judgment( tot2, tot1 );
24             }
25         }
26     }
27
28     public static void judgment( int a, int b ){
29         int judge = a - b;
30         if( judge % 11 == 0 ){
31             System.out.println( str +" is a multiple
                   of 11." );
32         }
33         else{
34             System.out.println( str +" is not a
                   multiple of 11." );
35         }
36     }
37 }
```

3.5 HW1

```
1  package com.company;
2  import java.math.BigDecimal;
3  import java.util.Scanner;
4  import java.util.StringTokenizer;
5
6  public class Main {
7      public static void main(String[] args) {
8          Scanner scanner = new Scanner(System.in);
9          String str = scanner.next();
10         BigDecimal ans = new BigDecimal(0);
11         String[] num = new String[50];
12         String[] sign = new String[50];
13
14         int flag = 0, flagg = 0;
15
16         StringTokenizer token = new
                   StringTokenizer(str,"+-*/%,()",true);
17         while(token.hasMoreTokens()){
```

```
18             String str1 = token.nextToken();
19             if( Character.isDigit(str1.charAt(0))){
20                 num[flag] = str1;
21                 if( flag > 0 ){
22                     System.out.print(" ");
23                 }
24                 System.out.print(num[flag]);
25                 flag++;
26             }
27             else{
28                 sign[flagg] = str1;
29                 flagg++;
30             }
31         }
32         System.out.println();
33
34         for(int i = 0 ; i < sign.length ; i++ ){
35             if(sign[i] == null){
36                 break;
37             }
38             else if(i > 0){
39                 System.out.print(" ");
40             }
41             System.out.print(sign[i]);
42         }
43         System.out.println();
44
45         for( int i = 0 ; i < num.length ; i++ ){
46             if( num[i] == null ){
47                 break;
48             }
49             BigDecimal cal = new BigDecimal(num[i]);
50             ans = ans.add(cal);
51         }
52         System.out.printf("%.3f",ans);
53         System.out.println();
54     }
55 }
```

3.6 primenumber

```
1  package com.company;
2  import java.lang.Math;
3  import java.util.Scanner;
4
5  public class Main {
6      public static void main(String[] args) {
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;
14             for (int i = 2; i <= Math.sqrt(j); i++)
15             {
16                 if (j % i == 0)
17                 {
18                     answer = false;
19                     break;
20                 }
21             }
22             if (answer)
23             {
24                 arr[flag] = j;
25                 flag++;
26             }
27         }
28         for(int i = 0 ; i < flag ; i++){
29             int temp = i+1;
30             System.out.print(arr[i]);
31             if( temp % 10 != 0 && i != flag -1){
32                 System.out.print(" ");
33             }
34
35             if( i == flag -1 && temp % 10 != 0){
```

```
36            System.out.println();
37        }
38
39        if( temp % 10 == 0){
40            System.out.println();
41        }
42    }
43  }
44 }
```

3.7 palindromeprime

```java
1  package com.company;
2  import java.util.Scanner;
3  import java.lang.Math;
4  public class Main {
5
6      private static boolean prime ( int number){
7          for (int i = 2; i <= Math.sqrt(number); i++)
8          {
9              if (number % i == 0)
10             {
11                 return false;
12             }
13         }
14         return true;
15     }
16     private static boolean palindrome ( int number){
17         String numstr = number + "";
18         int left = 0;
19         int right = numstr.length() - 1;
20         while (left < right) {
21             if (numstr.charAt(left) !=
                     numstr.charAt(right)) {
22                 return false;
23             }
24             left++;
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;
34             for (int i = 2; i < 100000; i++) {
35                 if(num == 0){
36                     System.out.println();
37                     break;
38                 }
39
40                 if (palindrome(i) && flag < num) {
41                     if (prime(i)) {
42                         System.out.print(i);
43                         flag++;
44                         if (flag % 10 == 0) {
45                             System.out.println();
46                         }
47
48                         if (flag % 10 != 0 && flag !=
                             num) {
49                             System.out.print(" ");
50                         }
51
52                         if (flag == num  && flag % 10
                             != 0) {
53                             System.out.println();
54                         }
55                     }
56                 }
57             }
58         }
59     }
60 }
```

3.8 magicsquare

```java
1  package com.company;
2  import java.util.Scanner;
3
4  public class Main {
5      public static void main(String[] args) {
6          Scanner scanner = new Scanner(System.in);
7          while(scanner.hasNext()){
8              int n = scanner.nextInt();
9              if (n % 2 == 0){
10                 System.out.println("It is not an odd
                     number.");
11                 if(scanner.hasNext()){
12                     System.out.println();
13                 }
14                 continue;
15             }
16             int sum = (n * ((n * n) + 1))/2;
17             System.out.println(sum);
18
19             long[][] square = new long[n][n];
20             int row = n-1;
21             int col = n/2;
22             square[row][col] = 1;
23             for (long i = 2 ; i <= n*n ; i++) {
24                 if (square[(row + 1) % n][(col + 1) %
                     n] == 0) {
25                     row = (row + 1) % n;
26                     col = (col + 1) % n;
27                 }
28                 else {
29                     row = (row - 1 + n) % n;
30                 }
31                 square[row][col] = i;
32             }
33
34             for (int i = 0 ; i < n ; i++) {
35                 for (int j = 0 ; j < n ; j++) {
36                     System.out.printf("%5d",
                         square[i][j]);
37                 }
38                 System.out.println();
39             }
40             if(scanner.hasNext()){
41                 System.out.println();
42             }
43         }
44     }
45 }
```

3.9 primefactorization

```java
1  import java.util.Scanner;
2
3  public class Main {
4      private static boolean[] PrimeArray(long N){
5          boolean[] A = new boolean[(int)N+1];
6          A[0] = true;
7          A[1] = true;
8          for(long j = 2; j <= N ; j++) {
9              boolean judge = true;
10             for (int i = 2; i <= Math.sqrt(j); i++) {
11                 if (j % i == 0) {
12                     judge = false;
13                     A[(int) j] = false;
14                     break;
15                 }
16             }
17             if(judge){
18                 A[(int)j] = true;
19             }
20         }
21         return A;
22     }
```

```java
 23     private static String PrimeFactorization(long N){
 24         String str = "";
 25         boolean jud = false;
 26         for(long i = 2 ; N > 1 ; i++) {
 27             int flag = 1;
 28             if(N % i == 0) {
 29                 if(jud) {
 30                     str = str + " * ";
 31                 }
 32                 N = N / i;
 33                 str = str.concat(Long.toString(i));
 34                 jud = true;
 35                 while (N % i == 0) {
 36                     N = N / i;
 37                     flag++;
 38                 }
 39                 if(flag > 1){
 40                     str = str + "^";
 41                     str =
                            str.concat(Long.toString(flag));
 42                 }
 43             }
 44         }
 45         return str;
 46     }
 47     public static void main(String[] args) {
 48         Scanner scanner = new Scanner(System.in);
 49         int maxn = 0, flag = 0;
 50         int[] max = new int[1000];
 51         while(scanner.hasNextInt()){
 52             int N = scanner.nextInt();
 53             max[flag] = N;
 54             if(max[flag] > maxn){
 55                 maxn = max[flag];
 56             }
 57             flag++;
 58         }
 59         System.out.print(maxn + " ");
 60         System.out.printf("%d\n",
                (int)Math.sqrt(maxn));
 61         boolean[] A = PrimeArray(maxn);
 62         for(int i = 0 ; i < flag ; i++){
 63             if(A[max[i]]){
 64                 System.out.println(max[i]);
 65             }
 66             else{
 67                 System.out.println(PrimeFactorization(max[i]));
 68             }
 69         }
 70     }
 71 }
```

```java
 19         for(int j = 0 ; j < d ; j++){
 20             System.out.print("    ");
 21             t++;
 22         }
 23         int day, nd = 1;
 24         switch(i+1){case 4: case 6: case 9: case
                11: day = 30;break;
 25             case 2: if(leap){day = 29;}else{day =
                    28;}break;
                default: day = 31;break;}
 26         while(nd <= day){
 27             if(t % 7 == 0 && t != 0) {
 28                 System.out.println();
 29                 t = 0;
 30             }
 31             System.out.printf("%4d", nd);
 32             nd++;
 33             t++;
 34         }
 35         System.out.println();
 36         d = t;
 37         if(i != 11)
 38             System.out.println();
 39         }
 40     }
 41 }
 42 }
```

3.10 calendar

```java
 1 import java.util.Scanner;
 2
 3 public class Main {
 4
 5     public static void main(String[] args) {
 6         Scanner scanner = new Scanner(System.in);
 7         String[] month =
                {"January","February","March","April","May","June","July","August","September","October","November","December"
 8         int year = scanner.nextInt();
 9         int d = scanner.nextInt();
10         int t = 0;
11         boolean leap = (year % 4 == 0 && year % 100
                != 0) || year % 400 == 0;
12         for(int i = 0 ; i < 12 ; i++) {
13             System.out.println("            " +
                    month[i] + " " + year);
14             System.out.print("----------------------------\n
                    Sun Mon Tue Wed Thu Fri Sat\n");
15             if( d == 7){
16                 d = 0;
17             }
18             t = 0;
```