1.计算圆周率

```
public class yuanzhoulv {
public static void main(String[] args){
        double sum=0.0;
        double i,flag=1.0;
        for(i=1.0;i<=999999999.0;i=i+2.0){
            sum+=1.0/i*flag;
            flag*=(-1);
        }
        sum*=4.0;
        System.out.println(sum);
}
}
```

2.1

```
import java.util.Scanner;
public class CelsiusToFahrenheit {
public static void main(String[]
args){
Scanner input = new Scanner(Sys
tem.in);
System.out.print("Enter a degree i
n Celsius: ");
double celsius =input.nextDouble();
double fahrenheit = (9.0/5)*celsiu
s+32.0;
System.out.println(celsius+" Celsius
 is "+fahrenheit+" Fahrenheit");
}
}
```

2.2

```
import java.util.Scanner;
public class AreaAndVolume {
public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.print("Enter the radius and
length pf acylinder: ");
        double radius = input.nextDouble();
        double length =input.nextDouble();
        final double PI = 3.1415926535;
        double area
=(int)(radius*radius*PI*10000)/10000.0;
        double volume =(int)(area *
length*10)/10.0;
        System.out.println("The area is "+area+
                "\nThe volume is "+volume);
}
}
```

2.3

```
import java.util.Scanner;
public class FeetToMeter {
public static void main(String[]
args){
Scanner input = new Scanner(Syste
m.in);
System.out.print("Enter a value fo
r feet: ");
int feet =input.nextInt();
double meter = feet*0.305;
System.out.println(feet+" feet is
"+meter+" meters");
}
}
```

2.4

```
import java.util.Scanner;
public class poundsToKilograms {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter a
number in pounds: ");
        double numberInPounds =
input.nextDouble();
        double numberInKilograms
= numberInPounds*0.454;

    System.out.println(numberIn
Pounds + " pounds is " +
numberInKilograms + " kilogams");
    }
}
```

2.5

```
import java.util.Scanner;
public class GratuityAndTotal {
public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.print("Enter the subtotal and
```

```
a gratuity rate: ");
        double subtotal = input.nextDouble();
        int gratuityrate= input.nextInt();
        double gratuity =
(int)(subtotal*gratuityrate)/100.0;
        double total = gratuity+subtotal;
        System.out.println("The gratuity is
"+gratuity+" and toatl is "+total);
}
}
```

2.6

```
import java.util.Scanner;
public class
sumOfNumberInEachDigits {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter a
number between 0 and 1000: ");
        int sum=0;
        int number =
input.nextInt();
        while(number!=0){
            sum+=(number%10);
            number/=10;
        }
        System.out.println("The
sum of the digits is "+sum);
    }
}
```

2.7

```
import java.util.Scanner;
public class MinuteToYearAndDay {
public static void main(String[]
args){
Scanner input = new Scanner(Syste
m.in);
System.out.print("Enter the number
  of minutes: ");
int minute = input.nextInt();
int year = minute/(60*24*365);
int day = (minute/(60*24))%365;
System.out.println(minute+" minutes
  is approximately "+year+" years
  and "+day+" days");
}
}
```

2.8

```
import java.util.Scanner;
public class
numberToCharaterInASCII {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter
an ASCII code: ");
        int number =
input.nextInt();
        System.out.println("The
charcter for ASCII code " + number
              + " is " +
(char)number);
    }
}
```

2.9

```
import java.util.Scanner;
public class MoneteryUnit {
public static void main(String[] args){
    Scanner input = new Scanner(System.in);
    System.out.print("Enter an amount in
integer,for example 1156: ");
    int amount =input.nextInt();
    int remainingAmount =amount;

    int numberOfOneDollars =
remainingAmount/100;
    remainingAmount =
remainingAmount%100;

    int numberOfQuarters =
remainingAmount/25;
    remainingAmount =
remainingAmount%25;

    int numberOfDimes =
remainingAmount/10;
```

```
        remainingAmount =
remainingAmount%10;

        int numberOfNickels =
remainingAmount/5;
        remainingAmount =
remainingAmount%5;

        int numberOfPennies =
remainingAmount;

        System.out.println("Your amount
"+amount+" consists of \n"+

        "\t"+numberOfOneDollars+"dollarss\n"+

        "\t"+numberOfQuarters+"quarters\n"+

        "\t"+numberOfDimes+"dimes\n"+

        "\t"+numberOfNickels+"nickels\n"+

        "\t"+numberOfPennies+"pennies\n");
}
}
```

2.10

```
import javax.swing.JOptionPane;
public class
UsingTheGraphicaUserInterfaceInput {
        public static void main(String[] args){
        String
amountString=JOptionPane.showInputDialog(
"Enter an amount in double,for example
11.56: ");
        double amount
=Double.parseDouble(amountString);
        int remainingAmount
=(int)(amount*100);
        int numberOfOneDollars =
remainingAmount/100;
        remainingAmount =
remainingAmount%100;
        int numberOfQuarters =
remainingAmount/25;
        remainingAmount =
remainingAmount%25;
        int numberOfDimes =
remainingAmount/10;
        remainingAmount =
remainingAmount%10;
        int numberOfNickels =
remainingAmount/5;
        remainingAmount =
remainingAmount%5;
        int numberOfPennies =
remainingAmount;
        String output ="Your amount
"+amount+" consists of \n"+
        "\t"+numberOfOneDollars+"dollarss\n"+

        "\t"+numberOfQuarters+"quarters\n"+

        "\t"+numberOfDimes+"dimes\n"+

        "\t"+numberOfNickels+"nickels\n"+

        "\t"+numberOfPennies+"pennies\n";

        JOptionPane.showMessageDialog(null,o
utput);
        }
}
```

3.1

```
import java.util.Scanner;
public class
AvoidsSolvingQuadraticEquation
{
public static void main(String[]
args){
    Scanner input = new
Scanner(System.in);
    System.out.print("Enter
a,b,c: ");
    double a =
input.nextDouble();
    double b =
input.nextDouble();
    double c =
```

```
input.nextDouble();
    double d = b*b - 4*a*c;
    if(d>0){
      double r1 = (-b+Math.pow(d,
0.5))/(2*a);
      double r2 = (-b-Math.pow(d,
0.5))/(2*a);
       System.out.println("The
roots are " + r1 + " and " + r2);
    }
    else if(d==0){
       double r = -b/(2*a);
       System.out.println("The
root is " + r);
    }
    else{
       System.out.println("The
equation has no real roots");
    }
}
}
```

3.3

```
import java.util.Scanner;
public class
ToSolveTheLinerEquartion2x2 {
public static void main(String[]
args){
    Scanner input = new
Scanner(System.in);
    System.out.print("Enter
a,b,c,d,e,f: ");
    double a =
input.nextDouble();
    double b =
input.nextDouble();
    double c =
input.nextDouble();
    double d =
input.nextDouble();
    double e =
input.nextDouble();
    double f =
input.nextDouble();
    if((a*d-b*c)==0){
       System.out.println("The
equartion has no solution");
    }
    else{
       double x =
(e*d-b*f)/(a*d-b*c);
       double y =
(a*f-e*c)/(a*d-b*c);
       System.out.println("x is
" + x + " and y is " + y);
    }
}
}
```

3.5

```
import java.util.Scanner;
public class AddtionQuiz {
public static void main(String[]
args){
    int number1 =
(int)(System.currentTimeMillis(
)%10);
    int number2 =
(int)(System.currentTimeMillis(
)*7%10);
    int number3 =
(int)(System.currentTimeMillis(
)*8%10);
    Scanner input = new
Scanner(System.in);
    System.out.print("What is " +
number1 + " + " + number2 + " + "
+ number3 + " ? ");
    int answer = input.nextInt();
    System.out.println(number1 +
" + " + number2 + " + " + number3
+ " = " +
          answer + " is " +
(number1+number2+number3==answe
r));
}
}
```

3.7

```
import java.util.Scanner;
public class ComputeChange {
```

```
   public static void
main(String[] args){
       Scanner input = new
Scanner(System.in);
       System.out.print(
              "Enter an amount in
double ,for example 11.56: ");
       double amount =
input.nextDouble();

       int remainingAmount =
(int)(amount*100);

       int numberOfOneDollars =
remainingAmount / 100;
       remainingAmount =
remainingAmount % 100;
       int numberOfQuarters =
remainingAmount / 25;
       remainingAmount =
remainingAmount % 25;
       int numberOfDimes =
remainingAmount / 10;
       remainingAmount =
remainingAmount % 10;
       int numberOfNickles =
remainingAmount / 5;
       remainingAmount
=remainingAmount %5;
       int numberOfPennies =
remainingAmount;

       String output = "Your
amount " + amount + " consists
of\n" ;
       if(numberOfOneDollars>1)
           output += "\t" +
numberOfOneDollars + "
dollars\n";
       else
if(numberOfOneDollars==1)
           output += "\t" +
numberOfOneDollars + " dollar\n";
       else
           output = output;

       if(numberOfQuarters>1)
           output += "\t" +
numberOfQuarters + " quarters\n";
       else
if(numberOfQuarters==1)
           output += "\t" +
numberOfQuarters + " quarter\n";
       else
           output = output;

       if(numberOfDimes>1)
           output += "\t" +
numberOfDimes + " dimes\n";
       else if(numberOfDimes==1)
           output += "\t" +
numberOfDimes + " dime\n";
       else
           output = output;

       if(numberOfNickles>1)
           output += "\t" +
numberOfNickles + " nickles\n";
       else
if(numberOfNickles==1)
           output += "\t" +
numberOfNickles + " nickle\n";
       else
           output = output;

       if(numberOfPennies>1)
           output += "\t" +
numberOfPennies + " pennies\n";
       else
if(numberOfPennies==1)
           output += "\t" +
numberOfPennies + " pennie\n";
       else
           output = output;

   System.out.println(output);
   }
}
```

3.9

```
import java.util.Scanner;
public class ISBM {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter a
figure with nine numbers: ");
        String figure =
input.nextLine();
        int count=9,sum=0;
        int amount =
Integer.parseInt(figure);

    while(amount!=0&&count!=0){
            int number = amount %
10;
            amount = amount / 10;
            sum+=count*amount;
            count--;
        }
        int d10 = sum % 11;
        String output = "The ISBM
is " + figure;
        if(d10!=10)
            output+=d10;
        else
            output+='X';

    System.out.println(output);
    }
}
```

3.11

```
import java.util.Scanner;
public class
TheCountOfDaysInOneMonth {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter
the month and the year in number:
");
        int month =
input.nextInt();
        int year =
input.nextInt();
        int day=0;
        if(month==2){

    if((year%400==0)||(year%4==
0&&year%100!=0))
                day = 29;
            else
                day = 28;
        }
        else
if(month==1||month==3||month==5
||month==7||

    month==8||month==10||month=
=12){
            day = 31;
        }
        else
            day = 30;
        String output = " ";
        switch(month){
        case
1:output="January";break;
        case
2:output="February";break;
        case
3:output="March";break;
        case
4:output="April";break;
        case
5:output="May";break;
        case
6:output="Jane";break;
        case
7:output="July";break;
        case
8:output="August";break;
        case
9:output="September";break;
        case
```

```
10:output="October";break;
       case
11:output="November";break;
       case
12:output="December";
       }
       output+=" "+ year + " has
" + day +" days";

    System.out.println(output);
    }
}
```

3.13

```
import java.util.Scanner;
public class computeTax {
   public static void
main(String[] args){
      Scanner input=new
Scanner(System.in);

System.out.print("(0-singer,1-m
arried jointly,2-married
separately,3-head of
household)\n"+
            "Enter the filing
status: ");
      int
stasus=input.nextInt();
      System.out.print("Enter
the taxable income: ");
      double
income=input.nextDouble();
      double tax=0;
      if(stasus==0){
         if(income<=8350)
            tax=income*0.10;
         else if(income<=33950)

tax=8350*0.10+(income-8350)*0.1
5;
         else if(income<=82250)

tax=8350*0.10+(33950-8350)*0.15
+(income-33950)*0.25;
         else
if(income<=171550)

tax=8350*0.10+(33950-8350)*0.15
+(82250-33950)*0.25+(income-822
50)*0.28;
         else
if(income<=372950)

tax=8350*0.10+(33950-8350)*0.15
+(82250-33950)*0.25+(171550-822
50)*0.28+(income-171550)*0.33;
         else

tax=8350*0.10+(33950-8350)*0.15
+(82250-33950)*0.25+(171550-822
50)*0.28+(372950-171550)*0.33+(
income-372950)*0.35;}
      else if(stasus==1){
         if(income<=161700)
            tax=income*0.10;
         else if(income<=67900)

tax=16700*0.10+(income-16700)*0
.15;
         else
if(income<=137050)

tax=16700*0.10+(67900-16700)*0.
15+(income-67900)*0.25;
         else
if(income<=208850)

tax=16700*0.10+(67900-16700)*0.
15+(137050-67900)*0.25+(income-
137050)*0.28;
         else
if(income<=372950)

tax=16700*0.10+(67900-16700)*0.
15+(137050-67900)*0.25+(208850-
137050)*0.28+(income-208850)*0.
33;
         else
```

```
tax=16700*0.10+(67900-16700)*0.
15+(137050-67900)*0.25+(208850-
137050)*0.28+(372950-208850)*0.
33+(income-372950)*0.35;}
     else if(stasus==2){
          if(income<=8350)
              tax=income*0.10;
          else if(income<=33950)

tax=8350*0.10+(income-8350)*0.1
5;
          else if(income<=68525)

tax=8350*0.10+(33950-8350)*0.15
+(income-33950)*0.25;
          else
if(income<=104425)

tax=8350*0.10+(33950-8350)*0.15
+(68525-33950)*0.25+(income-685
25)*0.28;
          else
if(income<=186475)

tax=8350*0.10+(33950-8350)*0.15
+(68525-33950)*0.25+(104425-685
25)*0.28+(income-104425)*0.33;
          else

tax=8350*0.10+(33950-8350)*0.15
+(68525-33950)*0.25+(104425-685
25)*0.28+(186475-104425)*0.33+(
income-186475)*0.35;}
     else if(stasus==3){
          if(income<=11950)
              tax=income*0.10;
           else
if(income<=45500)

tax=11950*0.10+(income-11950)*0
.15;
           else
if(income<=117450)

tax=11950*0.10+(45500-11950)*0.
15+(income-45500)*0.25;
           else
if(income<=190200)

tax=11950*0.10+(45500-11950)*0.
15+(117450-45500)*0.25+(income-
117450)*0.28;
           else
if(income<=372950)

tax=11950*0.10+(45500-11950)*0.
15+(117450-45500)*0.25+(190200-
117450)*0.28+(income-190200)*0.
33;
           else

tax=11950*0.10+(45500-11950)*0.
15+(117450-45500)*0.25+(190200-
117450)*0.28+(372950-190200)*0.
33+(income-372950)*0.35;}
      else{

System.out.print("Error:
invalid status");
          System.exit(0);
          }
      System.out.println("Tax is
"+(int)(tax*100)/100.0);
      }
}
```

3.15

```
import java.util.Scanner;
public class Lottery {
   public static void
main(String[] args){
       Scanner input = new
Scanner(System.in);
       int lottery =
(int)(Math.random()*1000);
       System.out.print("Enter
your lottery pick(three digits):
```

```
");
        int guess =
input.nextInt();
        System.out.println("The
lottery number is "+lottery);
        int lotteryDigit1 =
lottery % 10;
        lottery /=10;
        int lotteryDigit2 =
lottery % 10;
        lottery /=10;
        int lotteryDigit3 =
lottery;
        int guessDigit1 = guess %
10;
        guess /= 10;
        int guessDigit2 = guess %
10;
        guess /= 10;
        int guessDigit3 = guess;

    if(lotteryDigit1==guessDigi
t1&&lotteryDigit2==guessDigit2

    &&lotteryDigit3==guessDigit
3)

    System.out.println("Exact
Match:you win $10,000");
       else
if((lotteryDigit1==guessDigit1&
&lotteryDigit2==guessDigit3

    &&lotteryDigit3==guessDigit
2)||(lotteryDigit1==guessDigit3

    &&lotteryDigit2==guessDigit
2&&lotteryDigit3==guessDigit1)|
|

    (lotteryDigit1==guessDigit2
&&lotteryDigit2==guessDigit1

    &&lotteryDigit3==guessDigit
3)||(lotteryDigit1==guessDigit1

    &&lotteryDigit2==guessDigit
2&&lotteryDigit3==guessDigit3)|
|

    (lotteryDigit1==guessDigit2
&&lotteryDigit2==guessDigit3

    &&lotteryDigit3==guessDigit
1)||(lotteryDigit1==guessDigit3
&&

    lotteryDigit2==guessDigit1&
&lotteryDigit3==guessDigit2))

    System.out.println("Match
all digits: you win $3,000");
       else
if(lotteryDigit1==guessDigit1||
lotteryDigit1==guessDigit2

    ||lotteryDigit1==guessDigit
3||lotteryDigit2==guessDigit1||

    lotteryDigit2==guessDigit2|
|lotteryDigit2==guessDigit3||

    lotteryDigit3==guessDigit1&
&lotteryDigit3==guessDigit2

    &&lotteryDigit3==guessDigit
3)

    System.out.println("Match
one digit: you win $1,000");
       else

    System.out.println("Sorry,n
o match");

    }
}
```

3.17

```
import java.util.Scanner;
public class scissorRockPaper {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        int computer =
(int)(Math.random()*3);

    System.out.print("scissor
(0),rock (1),paper (2): ");
        int user =
input.nextInt();
        String output = "";
        if(computer==0){
            output+="The computer
is scissor.";
            if(user==0)
                output+="You are
scissor too.It is a draw.";
            else if(user==1)
                output+="You are
rock.You win.";
            else
                output+="You are
paper.You lost.";
        }
        else if(computer==1){
            output+="The computer
is rock.";
            if(user==0)
                output+="You are
scissor.You lost.";
            else if(user==1)
                output+="You are
rock too.It is a draw.";
            else
                output+="You are
paper.You win.";
        }
        else{
            output+="The computer
is paper.";
            if(user==0)
                output+="You are
scissor.You win.";
            else if(user==1)
                output+="You are
rock.You lost.";
            else
                output+="You are
paper too.It is a draw";
        }

    System.out.println(output);
    }
}
```

3.19

```
import java.util.Scanner;
public class CheckTriangle {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter
three edges: ");
        double a =
input.nextDouble();
        double b =
input.nextDouble();
        double c =
input.nextDouble();
        boolean formTriangle =
(a+b>c)&&(a+c>b)&&(b+c>a);
        System.out.println("Can
edges "+a+" "+b+" "+c+" from a
triangle? "+formTriangle);
    }
}
```

4.2

```
import java.util.Scanner;
public class SubtractionQuizLoop
{
    public static void
main(String[] args){
        final int
numberOfQuestions = 10;
        int correctCount =0;
```

```
        int count = 0;
        long startTime =
System.currentTimeMillis();
        String output = "";
        Scanner input = new
Scanner(System.in);

    while(count<numberOfQuestio
ns){
            int number1 =
(int)(Math.random()*16);
            int number2 =
(int)(Math.random()*16);
            if(number1>number2){
                int temp = number1;
                number1= number2;
                number2=temp;
            }

    System.out.print("What is
"+number2+" - "+number1+" ? ");
            int answer =
input.nextInt();

    if(number2-number1==answer)
{

    System.out.println("You are
correct!");
                correctCount++;
            }
            else

    System.out.println("Your
answer is wrong.\n"+number2
                        +" -
"+number1+" should be
"+(number2-number1));
            count++;
            output +=
"\n"+number2+"-"+number1+"="+an
swer+" "+

    ((number2-number1==answer)?
"correct":"wrong");
        }
        long endTime =
System.currentTimeMillis();
        long testTime = endTime -
startTime;

    System.out.println("Correct
count is "+correctCount+
                "\nTestTime is
"+testTime/1000+"
seconds\n"+output);
    }
}
```

4.4

```
public class mileToKilometer {
    public static void
main(String[] args){
        System.out.println("英里
\t 千米");
        for(int i=1;i<=10;i++){
            double kilometer =
i*1.609;
            System.out.println(i
+ "\t" + kilometer);
        }
    }
}
```

4.6

```
public class
mileToKilometerInTwoChart {
    public static void
main(String[] args){
        System.out.println("英里
\t 千米\t 千米\t 英里");
        for(int i=1;i<=10;i++){
            int j = (i + 3)*5;
            System.out.println(i
+ "\t" + i*1.609 + "\t" + j + "\t"
+ (int)(j/1.609*1000)/1000.0);
        }
    }
}
```

4.8

```
import java.util.Scanner;
public class MaxGrade {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter
the number of students: ");
        int number
=input.nextInt();

    System.out.println("Enter
the name and the grade of each
student: ");
        String name1 = "";
        int grade1=0;
        for(int count
=1;count<=number;count++){
            String name =
input.next();
            int grade =
input.nextInt();
            if(grade>grade1){
                name1=name;
                grade1=grade;
            }
        }
        System.out.println("The
students whose grsde is highest:
" + name1);
    }
}
```

4.10

```
public class QuestionAboutNumber
{
    public static void
main(String[] args){
        final int numberOfPerLine
= 10;
        int count = 0;
        String output = "";
        for(int
i=100;i<=1000;i++){
            if(i%5==0&&i%6==0){
                count++;

    if(count%numberOfPerLine!=0
)

    output+=i+"\t";
                else

    output+=i+"\n";
            }
        }

    System.out.println(output);
    }
}
```

4.12

```
public class theMinN {
    public static void
main(String[] args){
        int n = 100;
        while(n*n<=12000){
            n++;
        }
        System.out.println("满足
n*n 大于 12000 的最小整数：  "+n);
    }
}
```

4.14

```
public class printASCIIcode {
    public static void
main(String[] args){
        int count = 0;
        String output = "";
        for(int i
=33;i<=126;i++){
            count++;
            if(count%10!=0)

    output+=(char)i+"\t";
            else

    output+=(char)i+"\n";
```

```
        }

    System.out.println(output);
    }
}
```

4.16

```
import java.util.Scanner;
public class minFactor {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter a
number: ");
        int number1 =
input.nextInt();
        int number = number1;
        String output = "";
        int sum = 1;
        for(int
i=2;i<=number1/2;i++){
            while(number%i==0){
                number/=i;
                sum *= i;
                if(sum==number1){
                    output+=i+"。";
                }
                else
                    output+=i+",
";
            }
        }
        System.out.println("The
min factor is \n"+output);
    }
}
```

4.18

```
public class printPictuer {
    public static void
main(String[] args){
        String output1 = "";
        for(int i=1;i<=6;i++){
            for(int
j=1;j<=i;j++){
                if(j!=i)
                    output1+=j+" ";
                else

    output1+=j+"\n";
            }
        }

    System.out.println(output1)
;
        String output2 = "";
        for(int i=6;i>=1;i--){
            for(int
j=1;j<=i;j++){
                if(j!=i)
                    output2+=j+" ";
                else

    output2+=j+"\n";
            }
        }

    System.out.println(output2)
;
        String output3 = "";
        for(int i=1;i<=6;i++){
            for(int
j=1;j<=6;j++){
                if(j<=6-i)
                    output3+="  ";
                else
if(j>6-i&&j<6)

    output3+=(7-j)+" ";
                else

    output3+=(7-j)+"\n";
            }
        }

    System.out.println(output3)
;
        String output4 = "";
        for(int i=1;i<=6;i++){
```

```
            for(int
j=1;j<=6;j++){
                if(j<=i-1)
                    output4+="  ";
                else
if(j>i-1&&j<6)

    output4+=(j-i+1)+" ";
                else

    output4+=(j-i+1)+"\n";
            }
        }

    System.out.println(output4)
;
    }
}
```

4.20

```
public class PrimeNumber {
    public static void
main(String[] args){
        final int
numberOfPrimesPerLine =8;
        int count=0;
        System.out.print("The
prime numbers between 2 and 1000
are \n");
        for(int
number=2;number<=1000;number++)
{
            boolean isPrime = true;
            for(int
divisor=2;divisor<=number/2;div
isor++){

    if(number%divisor==0){
                    isPrime =
false;
                    break;
                }
            }
            if(isPrime){
                count++;

    if(count%numberOfPrimesPerL
ine==0)

    System.out.println(number);
                else

    System.out.print(number+"
");
            }
        }
    }
}
```

5.4

```
import java.util.Scanner;
public class reverseNumber{
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter a
number: ");
        int number =
input.nextInt();
        reverse(number);
    }
    public static void
reverse(int number){
        String output ="";
        while(number!=0){
            output+= number%10;
            number/=10;
        }
    System.out.println(output);
}}
```

5.6

```
import java.util.Scanner;
public class printPicture {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter
line number:");
```

```
        int lineNumber =
input.nextInt();

    displayPattern(lineNumber);
    }
    public static void
displayPattern(int n){
        String output = "";
        for(int i=1;i<=n;i++){
            for(int
j=1;j<=n;j++){
                if(j<=n-i)
                    output+="  ";
                else if(j<n)
                    output+="
"+(n-j+1);
                else
                    output+="
"+(n-j+1)+"\n";
            }
        }

    System.out.println(output);
    }
}
```

5.8

```
public class
transitionBetweenCelsiusAndFahr
enheit{
    public static void
main(String[] args){
        System.out.print("摄氏度
\t\t 华氏度\t\t 华氏度\t\t 摄氏度
\n");
        double celsius =
40,fahrenheit=120;
        for(int i=1;i<=10;i++){

    System.out.println(celsius+
"\t\t"+celsiusToFahrenheit(cels
ius)+"\t\t"+

    fahrenheit+"\t\t"+fahrenhei
tToCelsius(fahrenheit)+"\n");
            celsius--;
            fahrenheit-=10;
        }
    }
    public static double
celsiusToFahrenheit(double
celsius){
        double fahrenheit =
(9.0/5)*celsius+32;
        return fahrenheit;
    }
    public static double
fahrenheitToCelsius(double
fahrenheit){
        double celsius =
(fahrenheit-32)*(5.0/9);
        return celsius;
    }
}
```

5.13

```
import java.util.Scanner;
public class Exercise5_13 {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter
an number: ");
        double i=
input.nextInt();

    System.out.println("i\t\tm(
i)");
        for(double j
=1;j<=i;j++){

    System.out.println(j+"\t\t"
+String.format("%.4f", m(j)));
        }
    }
    public static double m(double
j){
        double sum=0;
        for(double
```

```
t=1.0;t<=j;t++){
            sum+=t/(t+1);
        }
        return sum;
    }
}
```

5.16

```
public class Exercise5_16 {
    public static void
main(String[] args){
        System.out.print("The
number of days from 2000 to 2010:
");
        for(int i=2000;i <=
2010;i++){

    System.out.print(numberOfDa
ysInAYear(i)+" ");
        }
    }
    public static int
numberOfDaysInAYear(int year){

    if((year%400==0)||(year%4==
0&&year%100!=0)){
            return 366;
        }
        else
            return 365;
    }
}
```

5.22

```
import java.util.Scanner;
public class Exercise5_22 {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter a
number: ");
        double number =
input.nextDouble();
    System.out.println("sqrt("+
number+")=
"+String.format("%.4f",
sqrt(number)));
    }
    public static double
sqrt(double number){
        double lastguess = 1.0;
        double nextguess =
(lastguess +
(number/lastguess))/2;

    while(Math.abs(nextguess-la
stguess)>=0.0001){
            lastguess = nextguess;
            nextguess = (lastguess
+ (number/lastguess))/2;
        }
        return nextguess;
    }
}
```

5.25

```
import java.util.Scanner;
public class Exercise5_25 {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter
mills: ");
        long mills =
input.nextLong();

    System.out.println("After
converting, the answer is " +
convertMills(mills));
    }
    public static String
convertMills(long mills){
        String output = "";
        long totalmills = mills;
        long totalSeconds =
totalmills / 1000;
        long seconds =
```

```
totalSeconds % 60;
        long totalMinute =
totalSeconds / 60;
        long minutes =
totalMinute % 60;
        long hours = minutes / 60;

    output+=hours+":"+minutes+"
:"+seconds;
        return output;
    }
}
```

6.4

```
import java.util.Scanner;
public class Exercise6_4 {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        double[] scores = new
double[1000];
        double sum = 0;
        int count = 0;
        do{

    System.out.print("Enter a new
score: ");
            scores[count] =
input.nextDouble();
            if(scores[count]>=0)

    sum+=scores[count];

    }while(scores[count++]>=0);

    System.out.println("count is
"+(count));
        double average = sum /
(count-1);
        int numberOfAbove = 0;
        int numberOfBelow = 0;
        for(int
i=0;i<=count-2;i++){

    if(scores[i]>=average)
            numberOfAbove++;
        else
            numberOfBelow++;
        }

    System.out.println("Average
is "+average);

    System.out.println("Number
of scores above or equal to the
average: "+
            numberOfAbove);

    System.out.println("Number
of scores below to the average: "+
            numberOfBelow);
    }
}
```

6.6

```
public class Exercise6_6 {
    public static void
main(String[] args){
        final int
NUMBER_OF_PRIMES = 50;
        int[] primes = new
int[NUMBER_OF_PRIMES];
        int count = 0;
        int number = 2;
        System.out.println("The
first 50 prime numbers are \n");
        while(count <
NUMBER_OF_PRIMES){
            boolean isPrime = true;
            for(int
divisor=2;divisor<=Math.sqrt(nu
mber);divisor++){

    if(number%divisor==0){
                isPrime =
false;
                break;
            }
```

```
            }
            if(isPrime){
                primes[count] =
number;
                count++;
            }
            number++;
        }
        for(int
i=0;i<=NUMBER_OF_PRIMES-1;i++){
            if((i+1)%10!=0){

    System.out.print(primes[i]+
" ");
            }
            else

    System.out.println(primes[i
]);
        }
    }
}
```

6.7

```
public class Exercise6_7 {
    public static void
main(String[] args){
        int[] counts = new
int[10];
        int flag;
        for(int i=0;i<=99;i++){
            flag =
(int)(Math.random()*10);
            counts[flag]++;
        }
        for(int i=0;i<=9;i++){

    System.out.println("count
for "+i+" is "+counts[i]);
        }
    }
}
```

6.8

```
public class Exercise6_8 {
    public static void
main(String[] args){
        int[]
list1={2,34,53,65,3,5};
        double[]
list2={6.5,3.55,8.33,9.44};

    System.out.println(average(
list1));

    System.out.println(average(
list2));
    }
    public static int
average(int... array){
        int sum=0;
        for(int
i=0;i<=array.length-1;i++){
            sum+=array[i];
        }
        return sum/array.length;
    }
    public static double
average(double... array){
        double sum=0.0;
        for(int
i=0;i<=array.length-1;i++){
            sum+=array[i];
        }
        return sum/array.length;
    }
}
```

6.18

```
public class Exercise6_18 {
    public static void
main(String[] args){
        double[] array =
{6.0,4.4,1.9,2.9,3.4,2.9,3.5};

    InsertionSort.insertionSort
(array);
        for(int i =
0;i<array.length;i++)
```

```
    System.out.print(array[i]+"
");
    }
    public class InserctionSort{
        public void
insectionSort(double[] list){
            for(int i
=1;i<list.length;i++){
                double
currentElement =list[i];
                int k;

    for(k=i-1;k>=0&&currentElem
ent<list[k];k--){

    list[k+1]=list[k];
                }

    list[k+1]=currentElement;
            }
        }
    }
}
```

6.28

```
import java.util.Scanner;
public class Exercise6_28 {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        final int number = 10;
        System.out.print("Enter
ten number: ");
        int[] array = new
int[number];
        for(int i =
0;i<array.length;i++){

    array[i]=input.nextInt();
        }
        for(int
i=0;i<array.length-1;i++)
            for(int
j=i+1;j<array.length;j++)

    System.out.println(array[i]
+" "+array[j]);
    }
}
```

6.29

```
public class Exercise6_29 {
    public static void
main(String[ ] args){
        int time = 0;
        int sum=0;
        do{
            sum=0;
            int[] array =new
int[4];
            for(int i=0;i<4;i++){

    array[i]=(int)(Math.random(
)*13)+1;
                sum+=array[i];
            }
            time++;
        }while(sum!=24);
        System.out.println("The
count is "+time);
    }
}
```

8.4

```
import java.util.Random;
public class Exercise8_4 {
    public static void
main(String[] args){
        Random random = new
Random(1000);
        int temp=0;
        for(int i=1;i<=50;i++){
            if(temp%10==0)

    System.out.println();

    System.out.print(random.nex
tInt(100)+" ");
            temp++;
```

```
        }
    }
}
```

8.8

```
public class Fan {
    public static int SLOW = 1;
    public static int MEDIUM = 2;
    public static int FAST = 3;
    private int speed = SLOW;
    private boolean on = false;
    private double radius = 5;
    private String color = "blue";
    public int getSpeed(){
        return speed;
    }
    public boolean getOn(){
        return on;
    }
    public double getRadius(){
        return radius;
    }
    public String getColor(){
        return color;
    }
    public void setSpeed(int
newSpeed){
        speed = newSpeed;
    }
    public void setOn(boolean
newOn){
        on = newOn;
    }
    public void setRadius(double
newRadius){
        radius = newRadius;
    }
    public void setColor(String
newColor){
        color = newColor;
    }
    public Fan(){

    }
    public String toString(){
        if(on ==true)
            return
speed+"\t"+color+"\t"+radius;
        else
            return "Fan is
off"+"\t"+color+"\t"+radius;
    }
}
public class TestFan {
    public static void
main(String[] args){
        Fan fan1 = new Fan();
        fan1.setSpeed(Fan.FAST);
        fan1.setRadius(10);;
        fan1.setColor("yellow");
        fan1.setOn(true);

    System.out.println(fan1.toS
tring());

        Fan fan2 = new Fan();
        fan2.setSpeed(2);

    System.out.println(fan2.toS
tring());
    }
}
```

8.10

```
public class QuadraticEquation {
    private double a;
    private double b;
    private double c;
    public
QuadraticEquation(double
newA,double newB,double newC){
        a = newA;
        b = newB;
        c = newC;
    }
    public double getA(){
        return a;
    }
    public double getB(){
        return b;
```

```
    }
    public double getC(){
        return c;
    }
    public double
getDiscriminant(){
        return b*b-4*a*c;
    }
    public double getRoot1(){
        if(getDiscriminant()<0)
            return 0;
        else
            return
(-b+Math.pow(getDiscriminant(),
0.5))/(2*a);
    }
    public double getRoot2(){
        if(getDiscriminant()<0)
            return 0;
        else
            return
(-b-Math.pow(getDiscriminant(),
0.5))/(2*a);
    }
}
import java.util.Scanner;
public class
TestQuadraticEquation {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter
a,b,c : ");
        double a =
input.nextDouble();
        double b =
input.nextDouble();
        double c =
input.nextDouble();
        QuadraticEquation
equation = new
QuadraticEquation(a,b,c);
        double discriminant =
equation.getDiscriminant();
        if(discriminant<0)

    System.out.println("The
equation has no roots.");
        else if(discriminant==0)

    System.out.println("The root
is "+equation.getRoot1());
        else

    System.out.println("The
roots are "+equation.getRoot1()+
                    " and
"+equation.getRoot2());
    }
}
```

8.7

```
import java.util.Date;
public class Account {
    private int id = 0;
    private double balance = 0;
    private double
annualInterestRate = 0;
    Date dateCreated = new Date();
    public Account(){

    };
    public Account(int
newId,double newBalance){
        id = newId;
        balance = newBalance;
    }
    public int getId(){
        return id;
    }
    public double getBalance(){
        return balance;
    }
    public double
getAnnualInterestRate(){
        return
annualInterestRate;
```

```
    }
    public void setId(int newId){
        id = newId;
    }
    public void setBalance(double
newBalance){
        balance = newBalance;
    }
    public void
setAnnualInterestRate(double
newAnnualInterestRate){
        annualInterestRate =
newAnnualInterestRate;
    }
    public Date getDateCreated(){
        return dateCreated;
    }
    public double
getMonthlyInterestRate(){
        return
annualInterestRate/12;
    }
    public double withDraw(double
number1){
        return balance-number1;
    }
    public double deposit(double
number2){
        return balance+number2;
    }
}
public class TestAccount {
    public static void
main(String[] args){
        Account account = new
Account(1122,20000);

    account.setAnnualInterestRa
te(4.5);
        account.withDraw(2500);
        account.deposit(3000);

    System.out.println("Balance
is "+account.getBalance());
        System.out.println("The
monthlyInterested is
"+account.getMonthlyInterestRat
e());
        System.out.println("This
account was created at
"+account.getDateCreated());
    }
}
```

8.9

```
public class RegularPolygon {
    private int n = 3;
    private double side = 1;
    private double x = 0;
    private double y = 0;
    public RegularPolygon(){

    }
    public RegularPolygon(int
newN,double newSide){
        n = newN;
        side = newSide;
    }
    public RegularPolygon(int
newN,double newSide,double
newX,double newY){
        n = newN;
        side = newSide;
        x = newX;
        y = newY;
    }
    public int getN(){
        return n;
    }
    public double getSide(){
        return side;
    }
    public double geyX(){
        return x;
    }
    public double getY(){
        return y;
    }
    public void setN(int newN){
```

```
        n = newN;
    }
    public void setSide(double
newSide){
        side = newSide;
    }
    public void setX(double
newX){
        x = newX;
    }
    public void setY(double
newY){
        y = newY;
    }
    public double getPerimeter(){
        return n*side;
    }
    public double getArea(){
        return
(n*side*side)/(4*Math.tan(getPe
rimeter()/n));
    }
}
public class TestRegularPolygon {
    public static void
main(String[] args){
        RegularPolygon
regularPolygon1 = new
RegularPolygon();
        System.out.println("For
regularPolygon1, the perimeter is
"+

regularPolygon1.getPerimeter()+
" and the area is
"+regularPolygon1.getArea());
        RegularPolygon
regularPolygon2 = new
RegularPolygon(6,4);
        System.out.println("For
regularPolygon2, the perimeter is
"+

regularPolygon2.getPerimeter()+
" and the area is
"+regularPolygon2.getArea());
        RegularPolygon
regularPolygon3 = new
RegularPolygon(10,4,5.6,7.8);
        System.out.println("For
regularPolygon3, the perimeter is
"+

regularPolygon3.getPerimeter()+
" and the area is
"+regularPolygon3.getArea());
    }
}
```

8.13

```
import java.util.Scanner;
public class TestLocation {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter
the number of rows and columns of
the array: ");
        int rows =
input.nextInt();
        int columns =
input.nextInt();
        double[][] array = new
double[rows][columns];

    System.out.println("Enter
the array:");
        for(int i=0;i<rows;i++)
            for(int
j=0;j<columns;j++)

    array[i][j]=input.nextDoubl
e();
        Location location =
Location.locatelargest(array);
        System.out.println("The
location of the largest element is
"+location.maxValue+
                " at
```

```
"+"("+location.row+","+location
.column+")");
    }
}
public class Location {
    public int row;
    public int column;
    public double maxValue;
    public static Location
locatelargest(double[][]
array){
        Location location = new
Location();
        location.maxValue =
array[0][0];
        for(int
i=0;i<array.length;i++)
            for(int j
=0;j<array[0].length;j++){

    if(array[i][j]>location.max
Value){
                    location.row =
i;

    location.column = j;

    location.maxValue =
array[i][j];
                }
            }
        return location;
    }
}
```

9.2

```
import java.util.Scanner;
public class Exercise9_2 {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter
the first string:");
        String first =
input.nextLine();
        System.out.print("Enter
the second string:");
        String second =
input.nextLine();

    if(isSubstring(first,second
)){

    System.out.println(first+"
is a substring of "+second);
        }
        else{

    System.out.println(first+"
is not a substring of "+second);
        }
    }
    public static boolean
isSubstring(String first,String
second){
        int index = 0;
        for(int
i=0;i<second.length();i++){

    if(second.charAt(i)==first.
charAt(index)){
                index++;
            }
        }

    if(index==first.length()){
            return true;
        }
        else
            return false;
    }
}
```

9.4

```
import java.util.Scanner;
public class Exercise9_4 {
    public static void
main(String[] args){
```

```
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter a
string and a character: ");
        String str = input.next();
        String c = input.next();
        char a = c.charAt(0);

    System.out.println(count(st
r,a));
    }
    public static int
count(String str,char a){
        int number = 0;
        for(int
i=0;i<str.length();i++){
            if(str.charAt(i)==a)
                number++;
        }
        return number;
    }
}

10.2
public class Exercise10_2 {
    public static void
main(String[] args){
        BMI bmi1= new BMI("john
Doe",18,145,5,10);
        System.out.println("The
BMI for " + bmi1.getName() +" is
"+
                bmi1.getBMI()+"
"+bmi1.getStatus());
        BMI bmi2 = new BMI("Peter
King", 215, 5, 10);
        System.out.println("The
BMI for " + bmi2.getName() + " is
"
              + bmi2.getBMI() + " "
+ bmi2.getStatus());
    }
    static class BMI{
        private String name;
        private int age;
        private double weight; //
in pounds
        private double height; //
in inches
        public final double
KILOGRAMS_PER_POUND =
0.45359237;
        public final double
METERS_PER_INCH = 0.0254;
        public BMI(String name,
int age, double weight, double
feet, double inches) {
            this.name = name;
            this.age = age;
            this.weight = weight;
            this.height = feet * 12
+ inches;
          }
        public BMI(String name,
int age, double weight, double
height) {
            this.name = name;
            this.age = age;
            this.weight = weight;
            this.height = height;
        }
        public BMI(String name,
double weight, double height) {
            this(name, 20, weight,
height);
         }
        public double getBMI() {
            double bmi = weight *
KILOGRAMS_PER_POUND /
             ((height *
METERS_PER_INCH) * (height *
METERS_PER_INCH));
            return Math.round(bmi
* 100) / 100.0;
        }
        public String getStatus()
{
            double bmi = getBMI();
```

```
          if (bmi < 16)
            return "seriously
underweight";
          else if (bmi < 18)
            return
"underweight";
          else if (bmi < 24)
            return "normal
weight";
          else if (bmi < 29)
            return "over
weight";
          else if (bmi < 35)
            return "seriously
over weight";
          else
            return "gravely over
weight";
        }
        public String getName() {
          return name;
        }
        public int getAge() {
          return age;
        }
       public double getWeight()
{
          return weight;
        }
        public double getHeight()
{
          return height;
        }
    }
}
```

10.5

```
import java.util.Scanner;
public class Exercise10_5 {
    public static void
main(String[] args){
       StackOfIntegers stack =
new StackOfIntegers();
       Scanner input = new
Scanner(System.in);
       System.out.print("Enter
an integers: ");
       int number =
input.nextInt();
       System.out.println("The
factors for "+number+" are ");
       int factor =2;
       while(factor<=number){
          if(number%factor==0){
             number/=factor;

    stack.push(factor);
          }
          else
             factor++;
       }
       while(!stack.empty()){

    System.out.print(stack.pop(
)+" ");
       }
    }
    static class StackOfIntegers{
       private int[] elements;
       private int size;
       public static final int
DEFAULT_CAPAITY = 16;
       public StackOfIntegers(){

    this(DEFAULT_CAPAITY);
       }
       public
StackOfIntegers(int capacity){
          elements = new
int[capacity];
       }
       public void push(int
value){

    if(size>=elements.length){
             int[] temp=new int
[elements.length*2];

   System.arraycopy(elements, 0,
```

```
temp, 0, elements.length);
                elements = temp;
            }
            elements[size++] =
value;
        }
        public int pop(){
            return
elements[--size];
        }
        public int peek(){
            return
elements[size-1];
        }
        public boolean empty(){
            return size==0;
        }
        public int getsize(){
            return size;
        }
    }
}
```

10.6

```
public class Exercise10_6 {
    public static void
main(String[] args){
        StackOfIntegers stack =
new StackOfIntegers();
        for(int i= 2;i<=120;i++){
            if(isPrime(i)){
                stack.push(i);
            }
        }
        System.out.println("The
prime numbers below 120 are ");
        while(!stack.empty()){

    System.out.print(stack.pop(
)+" ");
        }
    }
    public static boolean
isPrime(int number){
        for(int divosor =
2;divosor<=number/2;divosor++){
            if(number%divosor==0)
                return false;
        }
        return true;
    }
    static class StackOfIntegers{
        private int[] elements;
        private int size;
        public static final int
DEFAULT_CAPAITY = 16;
        public StackOfIntegers(){

    this(DEFAULT_CAPAITY);
        }
        public
StackOfIntegers(int capacity){
            elements = new
int[capacity];
        }
        public void push(int
value){

    if(size>=elements.length){
                int[] temp=new int
[elements.length*2];

  System.arraycopy(elements, 0,
temp, 0, elements.length);
                elements = temp;
            }
            elements[size++] =
value;
        }
        public int pop(){
            return
elements[--size];
        }
        public int peek(){
            return
elements[size-1];
        }
        public boolean empty(){
            return size==0;
```

```
        }
        public int getsize(){
            return size;
        }
    }
}
```

10.11

```
public class Exercise10_11 {
    public static void
main(String[] args){
        Circle2D c1 = new
Circle2D(2,2,5.5);
        System.out.println("Area
of c1 is "+c1.getArea());

    System.out.println("Perimet
er of c1 is "+c1.getPeimeter());

    System.out.println(c1.conta
ins(3,3)+" "+c1.contains(new
Circle2D(4,5,10.5))+" "+
                c1.overlaps(new
Circle2D(3,5,2.3)));
    }
    static class Circle2D{
        private double x;
        private double y;
        private double radius;
        public double getX(){
            return x;
        }
        public double getY(){
            return y;
        }
        public double
getRadius(){
            return radius;
        }
        public Circle2D(double
x,double y,double radius){
            this.x=x;
            this.y=y;
            this.radius=radius;
        }
        public Circle2D(){
            this(0,0,1);
        }
        public double getArea(){
            return
Math.PI*radius*radius;
        }
        public double
getPeimeter(){
            return
2*Math.PI*radius;
        }
        public boolean
contains(double x,double y){
            double d =
distance(this.x,this.y,x,y);
            return d<=radius;
        }
        public boolean
contains(Circle2D circle){
            double d =
distance(this.x,this.y,circle.x
,circle.y);
            return
d+circle.radius<=this.radius;
        }
        public boolean
overlaps(Circle2D circle){
            double d =
distance(this.x,this.y,circle.x
,circle.y);
            return
d<circle.radius+this.radius;
        }
        public static double
distance(double x1,double
y1,double x2,double y2){
            return Math.sqrt((x1 -
x2) * (x1 - x2) + (y1 - y2) * (y1
- y2));
        }
    }
}
```

11.2

```
import java.util.*;
public class Exercise11_2 {
    public static void
main(String[] args){

    }
}
class Person{
    protected String name;
    protected String address;
    protected String
telephoneNumber;
    protected String email;
}
class Student extends Person{
    public static int freshMan =
1;
    public static int sophomore =
2;
    public static int junior = 3;
    public static int senior = 4;
    public String toString(){
        return "Student";
    }
}
class Employee extends Person{
    protected String office;
    protected int salary;
    protected Calendar dateHired;
    public String tostring(){
        return "Employee";
    }
}
class Faculty extends Employee{
    public static int lecturer =
1;
    public static int
assistantProfessor = 2;
    public static int
associateProfessor = 3;
    public static int professor =
4;
    public String OfficeHours;
    protected int rank;
    public String toString(){
        return "Faculty";
    }
}
class Staff extends Employee{
    protected String title;
    public String toString(){
        return "Staff";
    }
}
```

11.4

```
import java.util.Scanner;
public class Mystack {
    public static void
main(String[] args){
        Scanner input = new
Scanner(System.in);
        System.out.print("Enter
five strings: ");
        java.util.ArrayList array
= new java.util.ArrayList();
        for(int i=0;i<=4;i++)

    array.add(input.next());
        for(int i=4;i>=0;i--)

    System.out.print(array.get(
i)+" ");
    }
}
```

11.6

```
import java.util.*;
public class Exercise11_6 {
    public static void
main(String[] args){
        ArrayList list = new
ArrayList();
        list.add(new Loan());
        list.add(new Date());
        list.add("String");
        list.add(new JFrame());
        list.add(new Circle());
        for(int
```

```
i=0;i<list.size();i++){

    System.out.print(list.get(i
).toString());
        }
    }
}
11.8
public class TestAccount {
    public static void
main(String[] args){

    Account.setAnnualInterestRa
te(1.5);
        Account account = new
Account("George",1122,1000);
        account.deposit(30);
        account.deposit(40);
        account.deposit(50);
        account.withdraw(5);
        account.withdraw(4);
        account.withdraw(2);

    System.out.println("Name:"+
account.getName());

    System.out.println("AnnualI
nterestRate:"+account.getAnnual
InterestRate());

    System.out.println("Balance
:"+account.getBalance());

    System.out.printf("%-35s%-1
5s%-15s%-15s\n", "Date", "Type",
"Amount", "Balance");
        java.util.ArrayList list
= account.getTransactions();
        for(int
i=0;i<list.size();i++){
            Transaction
transaction =
(Transaction)(list.get(i));

    System.out.printf("%-35s%-1
5s%-15s%-15s\n",
transaction.getDate(),transacti
on.getType(),transaction.getAmo
unt(),transaction.getBalance())
;
        }
    }
}
class Account {
    private String name;
    private int id;
    private double balance;
    private static double
annualInterestRate;
    private java.util.Date
dateCreated;
    java.util.ArrayList
transactions = new
java.util.ArrayList();
    public Account() {
      dateCreated = new
java.util.Date();
    }

    public Account(String
newString,int newId, double
newBalance) {
      name = newString;
      id = newId;
      balance = newBalance;
      dateCreated = new
java.util.Date();
    }

    public String getName(){
       return this.name;
    }

    public int getId() {
      return this.id;
    }

    public double getBalance() {
```

```
        return balance;
    }

    public java.util.ArrayList
getTransactions(){
        return transactions;
    }

    public static double
getAnnualInterestRate() {
        return
annualInterestRate;
    }

    public void setName(String
newName){
        name = newName;
    }

    public void setId(int newId)
{
        id = newId;
    }

    public void
setBalance(double newBalance) {
        balance = newBalance;
    }

    public static void
setAnnualInterestRate(double
newAnnualInterestRate) {
        annualInterestRate =
newAnnualInterestRate;
    }

    public double
getMonthlyInterest() {
        return balance *
(annualInterestRate / 1200);
    }

    public java.util.Date
getDateCreated() {
        return dateCreated;
    }

    public void withdraw(double
amount) {
        balance -= amount;
        transactions.add(new
Transaction('W', amount, balance,
""));
    }

    public void deposit(double
amount) {
        balance += amount;
        transactions.add(new
Transaction('D', amount, balance,
""));
    }
}
class Transaction{
    java.util.Date date = new
java.util.Date();
    private char type;
    private double amount;
    private double balance;
    private String description;
    public java.util.Date
getDate() {
        return date;
    }
    public char getType(){
        return type;
    }
    public void setType(){
        this.type = type;
    }
    public double getAmount(){
        return amount;
    }
    public double getBalance(){
        return balance;
    }
    public void setBalance(){
        this.balance=balance;
```

```
    }
    public String
getDescription(){
        return description;
    }
    public void setDescription(){
        this.description =
description;
    }
    public Transaction(char
type,double amount,double
balance,String description){
        this.type = type;
        this.amount=amount;
        this.balance=balance;

    this.description=descriptio
n;
    }
}
```

12.2

```
import javax.swing.*;
import java.awt.*;
public class TestBorderLayout
extends JFrame{
    public TestBorderLayout(){
        JPanel p1 = new JPanel(new
GridLayout(1,2,5,5));
        p1.add(new
JButton("Button 1"));
        p1.add(new
JButton("Button 2"));
        JPanel p2 = new JPanel(new
GridLayout(1,2,5,5));
        p2.add(new
JButton("Button 3"));
        p2.add(new
JButton("Button 4"));
        setLayout(new
BorderLayout());

    add(p2,BorderLayout.SOUTH);
    add(p1,BorderLayout.CENTER)
;
    }
    public static void
main(String[] args){
        TestBorderLayout frame =
new TestBorderLayout();

    frame.setTitle("TestBorderL
ayout");
        frame.setSize(200, 100);

    frame.setLocationRelativeTo
(null);

    frame.setDefaultCloseOperat
ion(JFrame.EXIT_ON_CLOSE);
        frame.setVisible(true);
    }
}
```

12.4

```
import javax.swing.*;
import java.awt.*;
public class ExJPanel extends
JFrame{
    public ExJPanel(){
        JPanel p1 = new
NewPanel("button 1","button
2","button 3");
        JPanel p2 = new
NewPanel("button 4","button
5","button 6");
        setLayout(new
BorderLayout());

    add(p1,BorderLayout.CENTER)
;

    add(p2,BorderLayout.SOUTH);
    }
    public static void
main(String[] args){
        ExJPanel frame = new
ExJPanel();
```

```
        frame.setTitle("@_@");
        frame.setSize(300, 200);
        frame.pack();

    frame.setLocationRelativeTo
(null);

    frame.setDefaultCloseOperat
ion(JFrame.EXIT_ON_CLOSE);
        frame.setVisible(true);
    }
}
class NewPanel extends JPanel{
    public NewPanel(String
s1,String s2,String s3){
        setLayout(new
GridLayout(2,2,5,5));
        add(new JButton(s1));
        add(new JButton(s2));
        add(new JButton(s3));
    }
}
```

12.7

```
import javax.swing.*;
import java.awt.*;
public class XOGame extends
JFrame{
    private ImageIcon xIcon = new
ImageIcon("image/1.png");
    private ImageIcon oIcon = new
ImageIcon("image/2.png");
    private ImageIcon Icon = new
ImageIcon("image/3.png");
    public XOGame(){
        setLayout(new
GridLayout(3,3,5,5));
        for(int i=1;i<=9;i++){
            int a =
(int)(Math.random()*3);
            switch(a){
            case 0:add(new
JLabel(xIcon));break;
            case 1:add(new
JLabel(oIcon));break;
            case 2:add(new
JLabel(Icon));break;
            }
        }
    }
    public static void
main(String[] args){
        XOGame frame = new
XOGame();
        frame.setTitle("*_*");
        frame.setSize(300, 300);

    frame.setLocationRelativeTo
(null);

    frame.setDefaultCloseOperat
ion(JFrame.EXIT_ON_CLOSE);
        frame.setVisible(true);
    }
}
```

12.8

```
import java.awt.*;
import javax.swing.*;
public class ExSwing extends
JFrame{
    public ExSwing(){
        setLayout(new
GridLayout(2,3,5,5));

        JPanel p1 = new JPanel();
        JButton jbBlack = new
JButton("black");
        JButton jbBlue = new
JButton("blue");
        JButton jbCyan = new
JButton("cyan");


    jbBlack.setBackground(Color
.white);

    jbBlue.setBackground(Color.
white);
```

```
    jbCyan.setBackground(Color.
white);


    jbBlack.setForeground(Color
.black);

    jbBlue.setForeground(Color.
blue);

    jbCyan.setForeground(Color.
cyan);
        p1.add(jbBlack);
        p1.add(jbBlue);
        p1.add(jbCyan);

        JPanel p2 = new JPanel();
        JButton jbGreen = new
JButton("green");
        JButton jbMagenta = new
JButton("magenta");
        JButton jbOrange = new
JButton("orange");


    jbGreen.setBackground(Color
.white);

    jbMagenta.setBackground(Col
or.white);

    jbOrange.setBackground(Colo
r.white);


    jbGreen.setForeground(Color
.green);

    jbMagenta.setForeground(Col
or.magenta);

    jbOrange.setForeground(Colo
r.orange);
        p2.add(jbGreen);
        p2.add(jbMagenta);
        p2.add(jbOrange);

        add(p1);
        add(p2);
    }
    public static void
main(String[] args){
        ExSwing frame = new
ExSwing();

    frame.setTitle("Exercise12_
8");
        frame.setSize(300,200);

    frame.setLocationRelativeTo
(null);

    frame.setDefaultCloseOperat
ion(JFrame.EXIT_ON_CLOSE);
        frame.setVisible(true);
    }
}
```