



CLASS X PROJECT SOLUTION

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```
1 //Program 1
2 import java.util.*;
3
4 public class MyClass
5 {
6     public static void main(String args[])
7     {
8         Scanner sc = new Scanner(System.in);
9         System.out.println("Enter Deposit Amount and number of years");
10
11         double principle = sc.nextDouble(), time = sc.nextDouble(), rate = 0.0, A =
12         0.0, CI = 0.0;
13
14         if(principle < 2000 && time >= 2 )
15         {
16             A = principle * (Math.pow((1 + 5.0 / 100), time));
17             CI = A - principle;
18         }
19         else if(principle >= 2000 && principle < 6000 && time >= 2 )
20         {
21             A = principle * (Math.pow((1 + 7.0 / 100), time));
22             CI = A - principle;
23         }
24         else if(principle >= 6000 && time >= 1 )
25         {
26             A = principle * (Math.pow((1 + 8.0 / 100), time));
27             CI = A - principle;
28         }
29         else if(time >= 5)
30         {
31             A = principle * (Math.pow((1 + 9.75 / 100), time));
32             CI = A - principle;
33         }
34         else
35         {
36             A = principle * (Math.pow((1 + 3.0 / 100), time));
37             CI = A - principle;
38         }
39
40         System.out.println("Amount Deposited: "+ principle);
41         System.out.println("Number of years: "+ time);
42         System.out.println("Compound Interest: "+ CI);
43         System.out.println("Total Amount: "+ (principle + CI));
44     }
45 }
```

```
1 //Program 2
2 import java.util.*;
3
4 public class MyClass
5 {
6     public static void main(String args[])
7     {
8         Scanner sc = new Scanner(System.in);
9         System.out.println("Enter Horsepower Amount");
10        double hp = sc.nextDouble(), fee = 0.0;
11
12        if(hp <= 50)
13            fee = 0;
14        else if(hp <= 100)
15            fee = 300;
16        else if(hp <= 200)
17            fee = 600;
18        else if(hp <= 300)
19            fee = 900;
20        else
21            fee = 1500;
22
23        System.out.println("License Fee Amount: \u20B9 " + fee);
24    }
25 }
```

```

1 //Program 3
2 import java.util.*;
3
4 public class MyClass
5 {
6     public static void main(String args[])
7     {
8         Scanner sc = new Scanner(System.in);
9         System.out.println("--Menu--");
10        System.out.println("1. Equilateral");
11        System.out.println("2. Isosceles");
12        System.out.println("3. Right-Angled triangle");
13        System.out.println("4. Scalene");
14
15        System.out.print("Enter your choice: ");
16        int choice = sc.nextInt();
17
18        System.out.println("\nEnter 3 sides: ");
19        double s1 = sc.nextDouble(), s2 = sc.nextDouble(), s3 = sc.nextDouble();
20
21        switch(choice)
22        {
23            case 1: if(s1 == s2 && s2 == s3)
24                    System.out.print("The triangle is Equilateral");
25                    else
26                    System.out.print("The triangle is not Equilateral");
27                    break;
28
29            case 2: if(s1 == s2 || s2 == s3 || s1 == s3)
30                    System.out.print("The triangle is Isosceles");
31                    else
32                    System.out.print("The triangle is not Isosceles");
33                    break;
34
35            case 3: if((s1*s1)+(s2*s2)==(s3*s3) || (s1*s1)+(s3*s3)==(s2*s2) ||
36                    (s2*s2)+(s3*s3)==(s1*s1))
37                    System.out.print("The triangle is Right Angled");
38                    else
39                    System.out.print("The triangle is not Right Angled");
40                    break;
41
42            case 4: if(s1 != s2 && s1 != s3 && s2 != s3)
43                    System.out.print("The triangle is Scalene");
44                    else
45                    System.out.print("The triangle is not Scalene");
46                    break;
47
48            default: System.out.println("Wrong choice");
49        }
50 }

```

```
1 //Program 4
2 import java.util.*;
3
4 public class MyClass
5 {
6     public static void main(String args[])
7     {
8         Scanner sc = new Scanner(System.in);
9         System.out.println("Enter two numbers");
10        int n1 = sc.nextInt(), n2 = sc.nextInt();
11        String m = n1 + "" + n2 ;
12        System.out.println("Merged Numberbers: " + m);
13    }
14 }
15
```

```
1 //Program 5
2 import java.util.*;
3
4 public class MyClass
5 {
6     public static void main(String args[])
7     {
8         for(int i=3; i<=300; i++)
9         {
10             if(isPrime(i) && isPrime(i+2))
11                 System.out.println(i + " " + (i+2));
12         }
13     }
14     static boolean isPrime(int n)
15     {
16         int count = 0;
17         for(int j=1; j<=n; j++)
18         {
19             if(n % j == 0)
20                 count++;
21         }
22         if(count == 2)
23             return true;
24
25         return false;
26     }
27 }
28
```

```

1 //Program 6
2 import java.util.*;
3
4 public class MyClass
5 {
6     public static void main(String args[])
7     {
8         Scanner sc = new Scanner(System.in);
9         System.out.println("--Menu--");
10        System.out.println("1. Prime Palindrome");
11        System.out.println("2. Armstrong");
12
13        System.out.print("Enter your choice: ");
14        int choice = sc.nextInt();
15
16        System.out.print("Enter a number: ");
17        int num = sc.nextInt();
18
19        switch(choice)
20        {
21            case 1: int count = 0;
22                    for(int i=1; i<=num; i++)
23                    {
24                        if(num % i == 0) count++;
25                    }
26                    if(count == 2)
27                    {
28                        int temp=num, rev = 0;
29                        while(temp > 0)
30                        {
31                            int d = temp % 10;
32                            rev = rev * 10 + d;
33                            temp /= 10;
34                        }
35                        if(rev == num)
36                            System.out.println(num + " is a prime-palindrome
37number");
38                        else
39                            System.out.println(num + " is not a prime-palindrome
40number");
41                    }
42                    break;
43
44            case 2: int temp, digits=0, last=0, sum=0;
45
46                    temp=num;
47
48                    while(temp>0)
49                    {
50                        temp = temp/10;
51                        digits++;
52                    }
53                    temp = num;
54                    while(temp>0)
55                    {
56                        last = temp % 10;
57                        sum += (Math.pow(last, digits));
58                        temp = temp/10;
59                    }
60                }
61        }
62    }
63 }

```

```
58         if(num == sum)
59             System.out.println(num + " is an Armstrong Number");
60         else
61             System.out.println(num + " is not an Armstrong Number");
62         break;
63     default: System.out.println(" Invalid choice");
64 }
65 }
66 }
```



```

1 //Program 7
2 import java.util.*;
3
4 public class MyClass
5 {
6     public static void main(String args[])
7     {
8         Scanner sc = new Scanner(System.in);
9         System.out.println("--Menu--");
10        System.out.println("1. Fibonnaci");
11        System.out.println("2. Series");
12
13        System.out.print("Enter your choice: ");
14        int choice = sc.nextInt();
15
16        switch(choice)
17        {
18            case 1: System.out.print("Enter no. of terms: ");
19                    int n = sc.nextInt();
20                    int a = 0, b = 1, c = a + b, i = 3;
21
22                    System.out.print(a + "," + b);
23                    do
24                    {
25                        System.out.print("," + c);
26                        a=b;
27                        b=c;
28                        c=a+b;
29                        i++;
30                    }while(i <= n);
31
32                    break;
33            case 2:
34                    int k=0;
35                    for(int j = 1; j<=6; j++)
36                    {
37                        k = k*10 + 1;
38                        System.out.print(k + " ");
39                    }
40                    break;
41            default:
42                    System.out.println("Wrong choice");
43
44        }
45    }
46 }

```

```
1 //Program 8
2 import java.util.*;
3
4 public class MyClass
5 {
6     public static void main(String args[])
7     {
8         Scanner sc = new Scanner(System.in);
9
10        System.out.print("Enter Name, Rate, Hour, days");
11        String name = sc.nextLine();
12        float Rate = sc.nextFloat(), rate = sc.nextFloat();
13        float hour = sc.nextFloat();
14        int days = sc.nextInt();
15
16        printSalary(name, rate, hour, days);
17
18    }
19    static void printSalary(String name, float rate, float hour, int days)
20    {
21        double salary = rate * hour * days;
22        System.out.println("Name: " + name);
23        System.out.println("Rate Per Hour: " + rate);
24        System.out.println("Hours Worked: " + hour);
25        System.out.println("Days Worked: " + days);
26        System.out.println("Salary: " + salary);
27    }
28 }
```

```

1 //Program 9
2 import java.util.*;
3
4 public class stock
5 {
6     String bname;
7     int qty;
8     double price, total, discount, netPrice;
9     stock(String n, int q, double p)
10    {
11        bname = n;
12        qty = q;
13        price = p;
14    }
15    void calculation()
16    {
17        total = price * qty;
18        if(qty > 30)
19        {
20            discount = 20.0/100 * total;
21            netPrice = total - discount;
22        }
23    }
24    void printAmount()
25    {
26        System.out.println("\n\nName: " + bname);
27        System.out.println("Qty: " + qty);
28        System.out.println("Total Price: " + total);
29        System.out.println("Discount: " + discount);
30        System.out.println("Net Price: " + netPrice);
31    }
32
33    public static void main(String args[])
34    {
35        Scanner sc = new Scanner(System.in);
36        System.out.print("Enter name: ");
37        String name = sc.nextLine();
38        System.out.print("Enter quantity: ");
39        int qty = sc.nextInt();
40        System.out.print("Enter Unit Price: ");
41        double Price = sc.nextDouble();
42
43        stock s1 = new stock(name, qty, Price);
44        s1.calculation();
45        s1.printAmount();
46
47    }
48 }

```

```
1 //Program 10
2 import java.util.*;
3
4 public class Distance
5 {
6     int f1, f2, n1, n2;
7     int finalFeet, finalInches;
8     Distance(int f, int n1, int ff, int n2)
9     {
10         f1 = f;
11         f2 = ff;
12         this.n1 = n1;
13         this.n2 = n2;
14     }
15     void sumOfDistance()
16     {
17         int totalInches = n1 + n2;
18         int feet = totalInches / 12;
19         finalInches = totalInches % 12;
20
21         finalFeet = f1 + f2 + feet;
22     }
23     void showDistance()
24     {
25         System.out.println(finalFeet + " feet " + finalInches + " inch");
26     }
27     public static void main(String args[])
28     {
29         Scanner sc = new Scanner(System.in);
30
31         System.out.println("Enter Distance 1 in form of Feet and Inches ");
32         int f1 = sc.nextInt();
33         int n1 = sc.nextInt();
34
35         System.out.println("Enter Distance 2 in form of Feet and Inches ");
36         int f2 = sc.nextInt();
37         int n2 = sc.nextInt();
38
39         Distance d1 = new Distance(f1, n1, f2, n2);
40         d1.sumOfDistance();
41         d1.showDistance();
42
43     }
44 }
```

```
1 //Program 11
2 import java.util.*;
3
4 public class MyClass
5 {
6     public static void main(String args[])
7     {
8         Scanner sc = new Scanner(System.in);
9         System.out.print("Enter a decimal number: ");
10        int n = sc.nextInt();
11        String s = "";
12        while (n > 0)
13        {
14            s = n % 2 + s;
15            n = n / 2;
16        }
17        System.out.println("Binary Form: " + s);
18
19
20    }
21 }
```

```
1 //Program 12
2 import java.util.*;
3
4 public class MyClass
5 {
6     public static void main(String args[])
7     {
8         Scanner sc = new Scanner(System.in);
9         int digits[] = new int[10];
10
11         System.out.print("Enter a number: ");
12         int num = sc.nextInt();
13
14         int temp = num;
15
16         while(temp>0)
17         {
18             int d = temp % 10;
19             digits[d]++;
20             temp = temp/10;
21         }
22
23         System.out.println("\nDigit\t\tFrequency\n");
24         for(int i=0;i<10;i++)
25         {
26             if(digits[i] != 0)
27                 System.out.println("    " + i + "\t\t\t" + digits[i]);
28         }
29     }
30 }
31 }
```

```

1 //Program 13
2 import java.util.*;
3
4 public class MyClass
5 {
6     static void getNumbers(int d[])
7     {
8         int n = d.length;
9         int temp = 0;
10        for(int i=0; i < n; i++)
11        {
12            for(int j=1; j < (n-i); j++)
13            {
14                if(d[j-1] < d[j])
15                {
16                    temp = d[j-1];
17                    d[j-1] = d[j];
18                    d[j] = temp;
19                }
20            }
21        }
22    }
23
24    static void displayArray(int d[])
25    {
26        for(int i = 0; i<d.length; i++)
27            System.out.print(d[i] + " ");
28    }
29
30    public static void main(String args[])
31    {
32        Scanner sc = new Scanner(System.in);
33        int ar[] = {3, 56, 67, 34, 24, 6, 1, 4 , 8, 9, 10, 22, 23, 36, 29};
34
35
36        System.out.print("\nBefore Sorting:\t");
37        displayArray(ar);
38        System.out.print("\nAfter Sorting:\t");
39        getNumbers(ar);
40        displayArray(ar);
41
42    }
43 }

```

```

1 //Program 14
2 import java.util.*;
3
4 public class MyClass
5 {
6     static void getNumbers(int x[])
7     {
8         int n = x.length;
9
10        // One by one move boundary of unsorted subarray
11        for (int i = 0; i < n-1; i++)
12        {
13            // Find the maximum element in unsorted array
14            int max_idx = i;
15            for (int j = i+1; j < n; j++)
16            {
17                if (x[j] > x[max_idx])
18                    max_idx = j;
19            }
20
21            // Swap the found maximum element with the first
22            // element
23            int temp = x[max_idx];
24            x[max_idx] = x[i];
25            x[i] = temp;
26        }
27    }
28
29    static void displayArray(int d[])
30    {
31        for(int i = 0; i<d.length; i++)
32            System.out.print(d[i] + " ");
33    }
34    public static void main(String args[])
35    {
36        Scanner sc = new Scanner(System.in);
37        int ar[] = {3, 56, 67, 34, 24, 6, 1, 4 , 8, 9, 10, 22, 23, 36, 29};
38
39
40        System.out.print("\nBefore Sorting:\t");
41        displayArray(ar);
42        System.out.print("\nAfter Sorting:\t");
43        getNumbers(ar);
44        displayArray(ar);
45    }
46 }
47 }

```



```
1 //Program 15
2 import java.util.*;
3
4 public class MyClass
5 {
6     void search(int index[ ], int phone[ ], int no)
7     {
8         int low = 0;
9         int high = index.length-1;
10        int found = 0, mid = 0;
11
12        while (low <= high)
13        {
14            mid = (high - low) / 2;
15
16            if (index[mid] == no)
17            {
18                found = 1;
19                break;
20            }
21
22            if (index[mid] < no)
23                low = mid + 1;
24            else
25                high = mid - 1;
26        }
27        if(found == 1)
28            System.out.println("Phone Number: " + phone[mid]);
29        else
30            System.out.println("The Index number is not present in the list");
31    }
32 }
```

```
1 //Program 16
2 public class MyClass
3 {
4     void search(int x[ ], int val)
5     {
6         int found = -1;
7         for(int i = 0; i<x.length; i++)
8         {
9             if(val == x[i])
10            {
11                found = i;
12                break;
13            }
14        }
15
16        if(found != -1)
17            System.out.println(val + " found at index " + found);
18        else
19            System.out.println("Search Unsuccessful");
20    }
21 }
```

```
1 //Program 17
2 import java.util.*;
3
4 public class MyClass
5 {
6     public static void main(String args[])
7     {
8         int ar[] = {3, 6, 9, 5, 12, 14, 8, 18, 7, 21, 10, 4};
9         int br[] = new int[12];
10        int left = 0, right = 11;
11
12        for(int i = 0; i<12; i++)
13        {
14            if(ar[i] %2 == 0)
15                br[left++] = ar[i];
16            else
17                br[right--] = ar[i];
18        }
19        for(int i = 0; i<12; i++)
20            System.out.print(br[i] + " ");
21    }
22 }
```

```
1 //Program 18
2 import java.util.*;
3
4 public class arraay_2d
5 {
6     public static void main(String args[])
7     {
8         int ar[][] = new int[4][5];
9
10        Scanner sc = new Scanner(System.in);
11        System.out.println("Enter 20 numbers");
12
13        for(int i=0; i<4; i++)
14        {
15            for(int j=0; j<5; j++)
16            {
17                ar[i][j] = sc.nextInt();
18            }
19        }
20        int max = ar[0][0];
21        System.out.println("You have entered:\n");
22        for(int i=0; i<4; i++)
23        {
24            for(int j=0; j<5; j++)
25            {
26                if(ar[i][j] > max)
27                    max = ar[i][j];
28                System.out.print(ar[i][j] + "\t");
29            }
30            System.out.println();
31        }
32
33        System.out.println("\nLargest Number: " + max);
34
35    }
36 }
37 }
```

```

1 //Program 19
2 import java.util.*;
3
4 public class MyClass
5 {
6     public static void main(String args[])
7     {
8         Scanner sc = new Scanner(System.in);
9         System.out.println("Enter a sentence: ");
10        String s = sc.nextLine();
11        s = s.toUpperCase();
12        s += " ";
13        String word = "";
14        int count = 0;
15
16        for(int i=0; i<s.length(); i++)
17        {
18            char ch = s.charAt(i);
19            if(ch != ' ')
20                word += ch;
21            else
22            {
23                System.out.println(word);
24                if(word.equals("GOOD"))
25                    count++;
26
27                word = "";
28            }
29        }
30
31        System.out.println("GOOD/good word Frequency: " + count);
32    }
33 }

```

```
1 //Program 20
2 import java.util.*;
3
4 public class MyClass
5 {
6     public static void main(String args[])
7     {
8         Scanner sc = new Scanner(System.in);
9         System.out.println("Enter a sentence: ");
10        String s = sc.nextLine();
11        s = s.toUpperCase();
12        for(int i=0; i<s.length(); i++)
13        {
14            char ch = s.charAt(i);
15            if(Character.isLetter(ch))
16            {
17                if(ch == 'Z')
18                    System.out.print("A");
19                else
20                    System.out.print(++ch);
21            }
22            else
23                System.out.print(ch);
24        }
25    }
26 }
27 }
```

QUESTIONS

1. A "XYZ Bank Ltd." accepts for one year or more and the rule that bank adopts for paying the interest is as follows :

- (i) If a deposit is less than Rs. 2000 and it is for 2 years or more, the interest rate is 5% compounded annually.
- (ii) If a deposit is Rs. 2000 or more but less than Rs. 6000 and for 2 years or more, the interest rate is 7% compounded annually.
- (iii) If a deposit is more than Rs. 6000 and it is for 1 years or more, the interest rate is 8% compounded annually.
- (iv) On all deposits for 5 years or more, interest is 9.75% compounded annually.
- (v) On all other deposits not under the above conditions, the interest is 3% compounded annually.

Write a program to input the amount to deposit and number of years. Calculate the interest and total balance amount after the given number of years. Print amount deposited, number of years, interest earned and total amount paid after the given years.

2. In order to force consumers to use lower horsepower cars and conserve energy the state adopts a set of progressive annual licence fees based upon the power rating of the car. The criteria and fees are as:

Horsepower	Licence Fees
Up to 50 Hp	Rs 0/-
More than 50 but 100Hp or less	Rs 300/-
More than 100 but 200Hp or less	Rs 600/-
More than 200 but 300Hp or less	Rs 900/-
More than 300 Rs	1500/-

Write a program to compute the licence fee based on the input values of Horsepower.

3. Write a program to input three sides of a triangle (s1, s2, s3). Using switch-case print whether the triangle is Equilateral, Isosceles, Right angled triangle or Scalene. The program should be used with menu and switch...case.

4. Write a program to input an integer n1 and another integer n2. Merge n2 after n1 and store merged number M. Print n1, n2 and merged number M. Example : Input : n1 = 24, n2 = 567 Output : M = 24567

5. Twin Prime numbers are such prime numbers whose difference is always 2
For example : (3,5) (5,7) (11,13)(17,19) etc.

Write a program to print all twin prime numbers between 3 to 300.

6. Write a menu driven program to accept an integer number. Check and print whether the number is a Prime-Palindrome or not OR an Armstrong number or not. Make proper use of switch-case.

(i) Prime-Palindrome number: If a number is prime and reads same in reverse and forward, the number is a Prime- Palindrome.

(ii) Armstrong number

7. Write a menu driven program to perform following operations using switch-case.

(i) Input the limit of series N. Print Fibonacci numbers upto N terms using do-while loop. At the end print sum of all Fibonacci numbers upto N. The Fibonacci numbers are generated by

assigning two numbers as 0 and 1 then every third number is sum of two previous numbers.

Example: Input N = 7 Output: 0, 1, 1, 2, 3, 5, 8 Sum of all the terms = 20

(ii) Print the following series upto 6 terms. Example: 1, 11, 111, 1111, 11111, 111111

8. Create a function :

void printSalary(String name, float rate, float hour, int days)- the function reads name of worker (name), payment rate per hour (rate), total number of hours worked (hour) and number of days worked (days). Calculate the salary amount to be paid to the worker by using rate per hour X hours worked X number of days worked. Print all the details of the worker.

Write a main function to input name, rate per hour, number of hours worked and number of days worked and by invoking above function calculate and print all the details.

9. Create a class stock as given :

Class name : stock

Data members/variables : bname (String type data for book name)

qty (integer as quantity of book)

price (double data as unit price of book)

total (double data as total cost)

discount (double data as discount)

netPrice (double data to find net price)

Members functions of class :

(i) stock(String n, int q, double p)- A constructor to assign n to bname, q to qty, p to price.

(ii) void calculation()- to calculate total cost and discount as 20% on total cost if quantity of book is more than 30 otherwise no discount. Find the net price excluding discount.

(iii) void printAmount()- to display product name, price, quantity, total cost, discount, net price to be paid.

Write a main program to input name of product, unit price of product and quantity and by using above class and functions print details of the product.

10. The sum of two distances is calculated as :

Distance 1 = 10 feet 24 inches

Distance 2 = 5 feet 16 inches

Sum of distances = 18 feet 4 inches

A class Distance has following members :

Instance variable/data members : f1, f2 (integers to store two feet values)

n1, n2 (integers to store two inches).

Member function/methods :

(i) **public Distance(int f, int n1, int ff, int n2)**- constructor to initialize f to f1, n1 to n1, f2 to ff, n2 to n2.

(ii) **public void showdistance()** - to display both the distances with suitable message.

(iii) **public void SumOfDistance()** - to find sum of distances using the above method and print the sum of distances.

Write a main program to input two distances. Print entered and sum of distances by invoking suitable functions.

11. Write a program to input a decimal number. Find the binary equivalent of the number. Print the number along with its binary form.

12. Write a program to input a long integer in num. Print the frequency of each digit present in num.

13. Write a function void getNumbers(int d[]) which takes an array d[] as argument with 20 integers. Arrange the array in descending order using Bubble sort method. Print the array before and after sorting.

14. Write a function void Arrange(float X[]) to accept the array with 20 floating type elements and arrange the array in Descending order using the Selection sort method. Print the array before and after sorting in any format.

15. Write a function **void search(int index[], int phone[], int no)** to accept index numbers, phone numbers and an index number (no). Using Binary search method search 'no' from the array index[] and print the phone number if 'no' is found in the sorted list of index numbers otherwise print a message "the Index number is not present in the list". Assume that the array index[] is already arranged in ascending order along with the phone numbers

16. Write a function void search() which takes a integer array x[] of 20 integers and an integer val as parameter. Search val from the array using linear search and print its place in the array if val is found otherwise print a message "Search unsuccessful".

17. Write a program to initialize a single dimensional array ar[] of 12 integers. Store all even integers of array ar[] from left to right and all odd integers from right to left in another array br[]. Print both the arrays.

Example:

Array ar[] = 3, 6, 9, 5, 12, 14, 8, 18, 7, 21, 10, 4

Output : Array br[] = 6, 12, 14, 8, 18, 10, 4, 21, 7, 5, 9, 3

18. Write a program to input a two dimensional array of 4 rows and 5 columns. Print the array in the form of a matrix of the same order. Also print the greatest and smallest integers. from the array and also print their average.

19. Write a program to input a sentence. Count and print the occurrence/frequency of a word "good" or "GOOD" from the sentence. Each word in the sentence contains either all small letters or all capital letters.

20. Input a string. Convert in upper case and shift each letter of the English alphabet one step towards right. Characters other than the alphabet remain the same. Print original and new string in two different lines with suitable documentation.

Example :

Input : ZEBRAS ARE FOUND IN THE FOREST

Output: AFCSBT BSF GPVOE JO UIF GPSFTU

Note:

- **Variable Description Table** should be made at the end of each program.
- **Sample output** should be written at last.
- **Write question** before each program.