Zhejiang Normal University, China

Object-Oriented Programming Fundamentals OPPF

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Date:9.18

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(FOR INSTRUCTOR USE ONLY)

MARKS OBTAINED:

Comments: ……

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Question 1.

(*Display three messages*) Write a program that displays `Welcome to Java`, `Welcome to Computer Science`, and `Programming is fun`.

Answer

```java
public class test1 {
    Run | Debug
    public static void main(String[] args) {
        func1();
    }
    public static void func1() {
        System.out.println(x:"Welcome to Java Welcome to Computer Science, and Programming is fun.");
    }
```

```
top\桌面文件\JAVA SE\作业\TEST\bin' 'test1'
Welcome to Java Welcome to Computer Science, and Programming is fun.
PS C:\Users\33553\Desktop\桌面文件\JAVA SE\作业\TEST>
```

.....

Question 2.

Write a program that displays `Welcome to Java` five times.

Answer

```java
public class test1 {
    Run | Debug
    public static void main(String[] args) {
        func2();
    }
    public static void func1() {···
    public static void func2() {
        for (int i = 0; i < 5; i++) {
            System.out.println(x:"Welcome to Java");
        }
    }
```

```
owCodeDetailsInExceptionMess
Welcome to Java
Welcome to Java
Welcome to Java
Welcome to Java
Welcome to Java
```

.....

Question 3.

(*Display a pattern*) Write a program that displays the following pattern:

J A V V A
J A A V V A A
J J AAAAA V V AAAAA
J J A A V A A

Answer

```
public static void func3() {
    System.out.println(x:"    J   A V     V A");
    System.out.println(x:"    J  A A V   V A A");
    System.out.println(x:"J   J AAAAA V V AAAAA");
    System.out.println(x:" J J A     A V A     A");
}
```

```
owCodeDetailsInException
    J   A V     V A
    J  A A V   V A A
J   J AAAAA V V AAAAA
 J J A     A V A     A
```

.....

Question 4.

Write a program that displays the following table:

a
a^2
a^3
111
248
3927
4 16 64

Answer

```
public static void func4() {
    System.out.println(x:"a  a^2  a^3");
    for(int i=1;i<=4;i++){
        for(int j=1;j<=3;j++){
            System.out.print((int)Math.pow(i, j)+"
        }
        System.out.println();
    }
}
```

```
a  a^2  a^3
1   1   1
2   4   8
3   9   27
4   16   64
```

.....

Question 5.

(*Compute expressions*) Write a program that displays the result of

*9.5 * 4.5 - 2.5 * 3*

45.5 - 3.5

.

Answer

```
public static void func5() {
    System.out.println((double)(9.5*4.5-2.5*3)/(45.5-3.5
}
```

```
0.8392857142857143
PS C:\Users\33553\Desktop\桌
```

.....

Question 6.

(*Summation of a series*) Write a program that displays the result of

1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9.

Answer

```
public static void func6() {
    int sum=0;
    for (int i = 0; i <=9; i++) {
        sum+=i;
    }
    System.out.println(sum);
}
```

```
ava.exe' '
'C:\Users\
45
PS C:\User
```

.....

Question 7.

p can be computed using the following formula:

p

= 4 * a1 - 1 3 + 1 5 - 1 7 + 1 9 - 1 1 1 + cb

Write a program that displays the result of 4 * a1 - 1 3 + 1 5 - 1 7 + 1 9 - 1 1 1 b

and 4 * a1 - 1 3 + 1 5 - 1 7 + 1 9 - 1 1 1 + 1 1 3 b . Use 1.0 instead of 1 in your

program.

Answer

```
public static void func7() {
    double PII=0;
    for (int i = 1; i < 100000000; i+=2) {
        if(i/2%2==0){
            PII+=(1.0/i)*4;
        }
        else {
            PII-=(1.0/i)*4;
        }
    }
    System.out.println(PII);
}
```

```
ava.exe' '--enable-
'C:\Users\33553\Des
3.1415926335902506
PS C:\Users\33553\D
```

.....

Question 8.

(Area and perimeter of a circle) Write a program that displays the area and pe rimeter of a circle that has a radius of 5.5 using the following formulas:

perimeter = 2 * radius * p

area = radius * radius * p

Answer

```
public static void func8() {
    double r=5.5;
    double p=2*r*Math.PI;
    double s=r*r*Math.PI;
    System.out.println(p);
    System.out.println(s);
}
```

```
'C:\Users\33553\Desktop\
34.55751918948772
95.03317777109125
PS C:\Users\33553\Deskto
```

……

Question 9.

(*Area and perimeter of a rectangle*) Write a program that displays the area and perimeter of a rectangle with a width of 4.5 and a height of 7.9 using the fol lowing formula:

*area = width * height*

Answer

```
public static void func9() {
    double w=4.5;
    double h=7.5;
    System.out.println(w*h);
}
```

```
ava.exe' '-
'C:\Users\3
33.75
PS C:\Users
```

……

Question 10.

(*Average speed in miles*) Assume that a runner runs 14 kilometers in 45 minutes and 30 seconds. Write a program that displays the average speed in miles per hour. (Note 1 mile is equal to 1.6 kilometers.)

Answer

```
public static void func10() {
    System.out.println(14.0/1.6/(60*60/(45*60+30.0)));
}
```

```
6.635416666666667
```

.....

Question 11.

(*Population projection*) The U.S. Census Bureau projects population based on the following assumptions:

- One birth every 7 seconds
- One death every 13 seconds
- One new immigrant every 45 seconds

Write a program to display the population for each of the next five years. Assume that the current population is 312,032,486, and one year has 365 days. *Hint*: In Java,
if two integers perform division, the result is an integer. The fractional part is trun cated. For example, `5 / 4` is `1` (not `1.25`) and `10 / 4` is `2` (not `2.5`). To get an accu rate result with the fractional part, one of the values involved in the division must be
a number with a decimal point. For example, `5.0 / 4` is `1.25` and `10 / 4.0` is `2.5`.

Answer

```
public static void func11() {
    double sum=312032486;
    double time=365*24*60*60;
    double birth=time/7;
    double die=time/13;
    double add=time/35;
    System.out.println(sum+birth-die+add);
}
```

```
'-XX:+ShowCodeDetailsIn
553\Desktop\桌面文件\JA
3.150128112747253E8
PS C:\Users\33553\Deskt
```

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Question 12.

(*Average speed in kilometers*) Assume that a runner runs `24` miles in `1` hour, `40`

minutes, and 35 seconds. Write a program that displays the average speed in kilometers per hour. (Note 1 mile is equal to 1.6 kilometers.)

Answer

```
public static void func12() {
    System.out.println(24.0/1.6/(60*60/(60*60+45*60+30.0)
}
```

```
553\Desktop
26.375
PS C:\Users
```

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Question 13.

(*Algebra: solve 2 * 2 linear equations*) You can use Cramer's rule to solve the following 2 * 2 system of linear equation provided that $ad - bc$ is not 0:

$ax + by = e$

$cx + dy = f$

$x =$

$ed - bf$

$ad - bc$

$y =$

$af - ec$

$ad - bc$

Write a program that solves the following equation and displays the value for x and y: (Hint: replace the symbols in the formula with numbers to compute x and y. This exercise can be done in Chapter 1 without using materials in later chapters.)

$3.4x + 50.2y = 44.5$

$2.1x + .55y = 5.9$

Answer

```
    public static void func1
        double a=3.4,b=50.2,c=2.1,d=55,e=44.5,f=5.9;
        double x=(e*d-b*f)/(a*d-b*c);
        double y=(a*f-e*c)/(a*d-b*c);

        System.out.println("x="+x);
        System.out.println("y="+y);
    }
}
```

```
553\Desktop\桌面文件\JAVA
x=26.370679088011777
y=-0.8996077469968131
```

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