

総合型選抜プログラミング実技試験  
サンプル問題解答例

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Java Modeでの解答例を掲載します。

1.(1)

Java Mode

```
1  int y = 1898;
2
3  boolean isOlympicYear(int year) {
4      if ( year == 1906 || year == 2021 ) {
5          return true;
6      }
7      if ( year == 1916 || year == 1940 || year == 1944 ) {
8          return false;
9      }
10     return year >= 1896 && (year-1896)%4 == 0;
11 }
12
13 void setup() {
14     if ( isOlympicYear( y ) ) {
15         println( y );
16     } else {
17
18         int d = 1;
19         boolean found = false;
20         while ( !found ) {
21             if ( isOlympicYear(y - d) ) {
22                 found = true;
23                 println( y-d );
24             }
25             if ( isOlympicYear(y + d) ) {
26                 found = true;
27                 println( y+d );
28             }
29             d++;
30         }
31     }
32 }
```

1.(2)

Java Mode

```
1  int x = 7500;
2  while(x > 7000) {
3      if(x % 7 == 0) {
4          print(x + " ");
5      }
6      x--;
7  }
```

1.(3)

Java Mode

```
1  int fortuneNumber(int x) {
2      while (x >= 10) {
3          int s = 0;
4          while (x > 0) {
5              s += x % 10;
6              x /= 10;
7          }
8          x = s;
9      }
10     return x;
11 }
12 }
```

```

13 void setup() {
14     noLoop();
15 }
16
17 void draw() {
18     println(fortuneNumber(19990929));
19 }

```

2.

## Java Mode

```

1  int n = 256;
2  float sx, sy;
3  float sa = 40;
4  float [] ex = new float [n];
5  float [] ey = new float [n];
6  float ea = 20;
7  float er = 120;
8  float et = 0;
9  float edt = 0.01;
10 float [] mx = new float [n];
11 float [] my = new float [n];
12 float ma = 10;
13 float mr = 30;
14 float mt = 0;
15 float mdt = 0.05;
16 float speed = 1;
17 int iter = 0;
18 int year = 0;
19
20 void setup() {
21     size(400, 400);
22     sx = width / 2;
23     sy = height / 2;
24 }
25
26 void draw() {
27     background(0);
28
29     updatePosition();
30     drawSun();
31     drawEarth();
32     drawMoon();
33     drawYear();
34
35     iter += 1;
36 }
37
38 void drawSun() {
39     fill(255, 165, 0);
40     noStroke();
41     ellipse(sx, sy, sa, sa);
42 }
43
44 void drawEarth() {
45     for (int i = 1; i < min(n, iter); ++i) {
46         stroke(255, 256 - i);
47         line(ex[i - 1], ey[i - 1], ex[i], ey[i]);
48     }
49     fill(0, 0, 255);
50     noStroke();
51     ellipse(ex[0], ey[0], ea, ea);
52 }
53
54 void drawMoon() {

```

```

55     for (int i = 1; i < min(n, iter); ++i) {
56         stroke(255, 256 - i);
57         line(mx[i - 1], my[i - 1], mx[i], my[i]);
58     }
59     fill(255, 255, 0);
60     noStroke();
61     ellipse(mx[0], my[0], ma, ma);
62 }
63
64 void updatePosition() {
65     for (int i = n - 1; i > 0; --i) {
66         ex[i] = ex[i - 1];
67         ey[i] = ey[i - 1];
68         mx[i] = mx[i - 1];
69         my[i] = my[i - 1];
70     }
71     ex[0] = sx + er * cos(et);
72     ey[0] = sy + er * sin(et);
73     et += edt * speed;
74     if (et > TWO_PI) {
75         et -= TWO_PI;
76         year += 1;
77     }
78     mx[0] = ex[0] + mr * cos(mt);
79     my[0] = ey[0] + mr * sin(mt);
80     mt += mdt * speed;
81 }
82
83 void drawYear() {
84     fill(255);
85     text("Year:␣" + year, 10, 20);
86 }
87
88 void keyPressed() {
89     if (key == CODED) {
90         if (keyCode == UP) {
91             speed *= 2;
92         } else if (keyCode == DOWN) {
93             speed /= 2;
94         }
95     } else if (key == '␣') {
96         speed = 1;
97     }
98 }

```