

```
1 class Metal:
2     #####
3     # Helping function
4     #####
5     def __trace(self, s):
6         print(s)
7
8     #####
9     # Manager function
10    #####
11    # Including a default contructor
12    def __init__(self, b):
13        self.__material = b
14    def __del__(self):
15        pass
16
17    #####
18    # Access function
19    #####
20    def getMaterial(self):
21        return self.__material
22    def setMaterial(self, b):
23        self.__material = b
24    def isGold(self):
25        return self.__material == "gold"
26
27    #####
28    # Implementor function
29    #####
30    def toString(self):
31        return("Material= " + str(self.__material))
32    def changeMaterial(self, b):
33        self.__material = b
```

```
1 class SpecialChinaCoin:
2     #####
3     # Helping function
4     #####
5     def __pi(self):
6         return 3.1416
7
8     #####
9     # Manager function
10    #####
11    # Including a default contructor
12    def __init__(self, r, square, metal):
13        self.__radius = r
14        self.__square = square
15        self.__metal = metal
16    def __del__(self):
17        pass
18
19    #####
20    # Access function
21    #####
22    def getRadius(self):
23        return self.__radius
24    def setRadius(self, r):
25        self.__radius = r
26    def getSquare(self):
27        return self.__square
28    def setSquare(self, square):
29        self.__square = square
30    def getMetal(self):
31        return self.__metal
32    def setMetal(self, metal):
33        self.__metal = metal
34    def isLarge(self):
35        return self.__radius > 20
36    def isValid(self):
37        return self.area() > 0
38
39    #####
40    # Implementor function
41    #####
42    def toString(self):
43        print (self.getSquare().toString())
44        print (self.getMetal().toString())
45        return "Radius= " + str(self.__radius)
46
47    def enlarge(self, r):
48        self.__radius += r
49    def area(self):
50        return self.__radius * self.__radius * self.__pi() - self.getSquare().area()
51    def circumference(self):
52        return 2 * self.__radius * self.__pi()
53
```

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```
1 class Square:
2     #####
3     # Helping function
4     #####
5     def __trace(self, s):
6         print(s)
7
8     #####
9     # Manager function
10    #####
11    # Including a default contrutctor
12    def __init__(self, b=1):
13        self.__side = b
14    def __del__(self):
15        pass
16
17    #####
18    # Access function
19    #####
20    def getSide(self):
21        return self.__side
22    def setSide(self, b):
23        self.__side = b
24    def isLarge(self):
25        return self.__side > 10
26
27    #####
28    # Implementor function
29    #####
30    def toString(self):
31        return "Side= " + str(self.__side)
32    def enlong(self, s):
33        self.__side += s
34    def area(self):
35        return self.__side * self.__side
36    def perimeter(self):
37        return self.__side * 4
38
```

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```
1 #!/usr/bin/python
2
3 # TestSpecialChinaCoin.py
4 import SpecialChinaCoin, Square
5 import Metal as Metal
6 import sys, getopt
7
8 def usage():
9     print ('Usmaterial: TestSpecialChinaCoin.py -h')
10    print ('Usmaterial: TestSpecialChinaCoin.py -r <radius> -s <side> -m <material>')
11    print ('Usmaterial: TestSpecialChinaCoin.py --radius=<radius> --side=<side> --material=<material>')
12
13 def main(argv):
14     radius = ''
15     side = ''
16     material = ''
17
18     try:
19         opts, args = getopt.getopt(argv,"hrs:m:",["radius=", "side=", "material="])
20     except getopt.GetoptError:
21         usage()
22         sys.exit(2)
23
24     for opt, arg in opts:
25         if opt == '-h':
26             usage()
27             sys.exit()
28         elif opt in ("--r", "--radius"):
29             radius = arg
30         elif opt in ("--s", "--side"):
31             side = arg
32         elif opt in ("--m", "--material"):
33             material = arg
34
35     square = Square.Square(side)
36     materil = Metal.Metal(material)
37     coin = SpecialChinaCoin.SpecialChinaCoin(material, float(radius), square)
38     print (coin.toString())
39     print("-----")
40
41     coin.changeMaterial("gold");
42     coin.enlong(1)
43     coin.enlarge(2)
44     print (coin.toString())
45     print("-----")
46
47 if __name__ == '__main__':
48     main(sys.argv[1:])
```

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