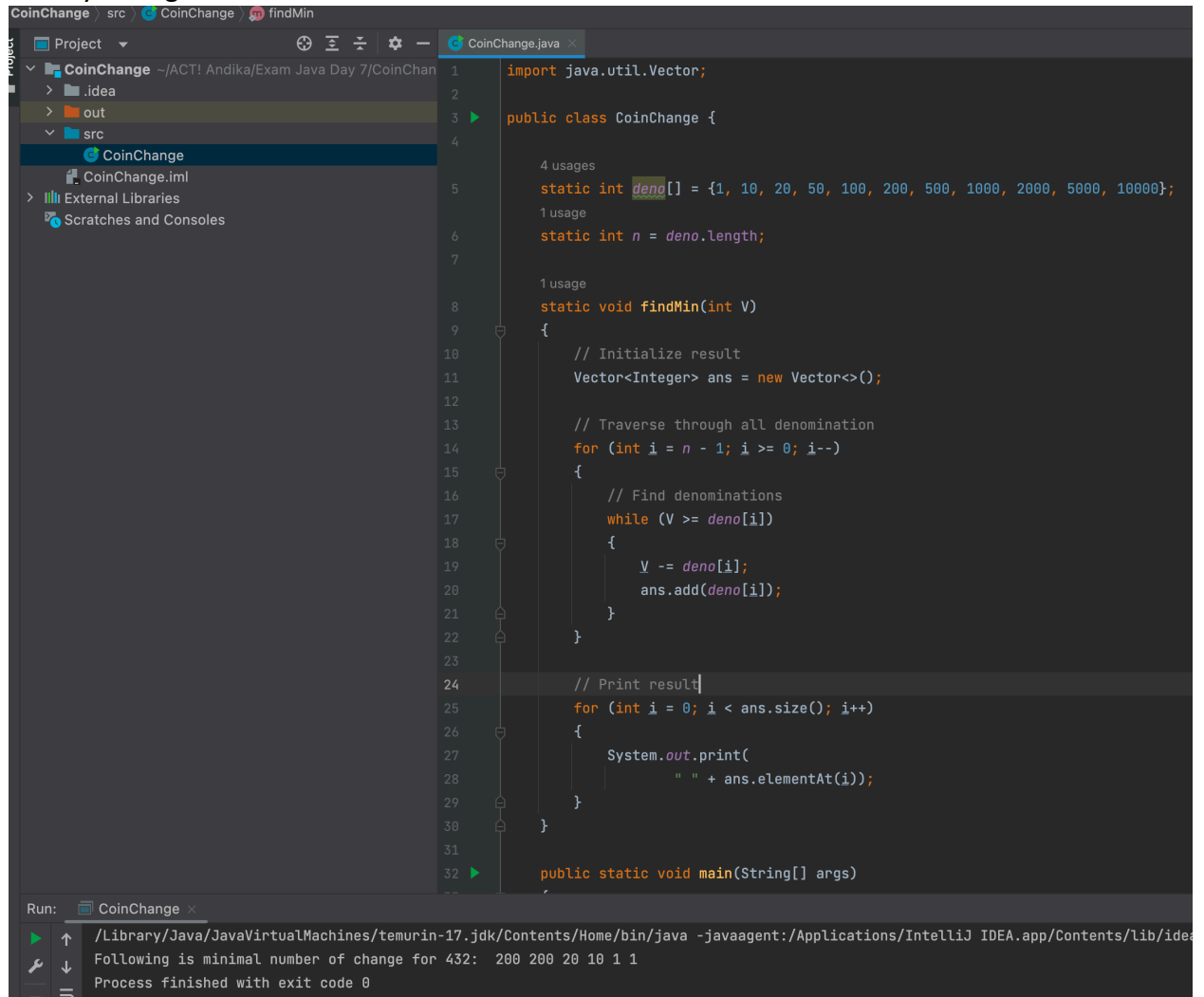


Problem Solving Paradigm

1. Simple question
2. Money Change



```
1 import java.util.Vector;
2
3 public class CoinChange {
4
5     4 usages
6     static int deno[] = {1, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000, 10000};
7     1 usage
8     static int n = deno.length;
9
10    1 usage
11    static void findMin(int V)
12    {
13        // Initialize result
14        Vector<Integer> ans = new Vector<>();
15
16        // Traverse through all denomination
17        for (int i = n - 1; i >= 0; i--)
18        {
19            // Find denominations
20            while (V >= deno[i])
21            {
22                V -= deno[i];
23                ans.add(deno[i]);
24            }
25        }
26
27        // Print result
28        for (int i = 0; i < ans.size(); i++)
29        {
30            System.out.print(
31                " " + ans.elementAt(i));
32        }
33    }
34
35    public static void main(String[] args)
```

Run: CoinChange

/Library/Java/JavaVirtualMachines/temurin-17.jdk/Contents/Home/bin/java -javaagent:/Applications/IntelliJ IDEA.app/Contents/lib/idea

Following is minimal number of change for 432: 200 200 20 10 1 1

Process finished with exit code 0

3. Dragon of Lootwater

4. BinarySearch

```
BinarySearch \ src \ BinarySearch \ main
BinarySearch.java x
3 usages
4 public static boolean binarySearchOptimization(int[] array, int x, int start, int end){
5     if (start > end) return false;
6
7     int mid = start + ((end-start)/2);
8
9     if (array[mid] > x) return true;
10    else if (x < array[mid]) return binarySearchOptimization(array, x, start, end: mid-1);
11    else return binarySearchOptimization(array, x, start: mid+1, end);
12 }
13
14 1 usage
15 public static int findIndex(int arr[], int t)
16 {
17     int index = Arrays.binarySearch(arr, t);
18     return (index < 0) ? -1 : index;
19 }
20
21 public static void main(String[] args) {
22     int[] array = {1, 1, 3, 5, 5, 6, 7};
23     boolean checkArray = binarySearchOptimization(array, x: 6, start: 0, end: array.length - 1);
24     if(checkArray) System.out.println(findIndex(array, t: 6));
25     else System.out.println("Not Found");
26 }
27 }

Run: BinarySearch x
/Library/Java/JavaVirtualMachines/temurin-17.jdk/Contents/Home/bin/java -javaagent:/Applications/IntelliJ IDEA.app/Contents/lib/ide
5
Process finished with exit code 0
```