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Companion exercises
Objektorientierte Programmierung: Wintersemester 2021

No. 2, due until 8.11.2021

Attention: From this exercise sheet forward, you may only hand in one submission per group.

Advice for handing in JShell-tasks:

You can use */ed* within JShell to open a simple text-editor. Using */save* <*Filename*> you can save the current inputs of your JShell. Name your completed tasks like this:
aufgabe-<Exercise-Sheet> <Task-Number>.txt

Task 2.1: Simple and Clean — 2 Points

Write a function

a) `predecessor` that takes a parameter of type `int` and returns its predecessor.

   Call predecessor with values 1337, 0 and -2147483648.

   Which results did you get? Which of those were expected?

b) `isEqual` that takes two parameters of type `String` and compares them. If they are equal, the function should return `true`, `false` otherwise.

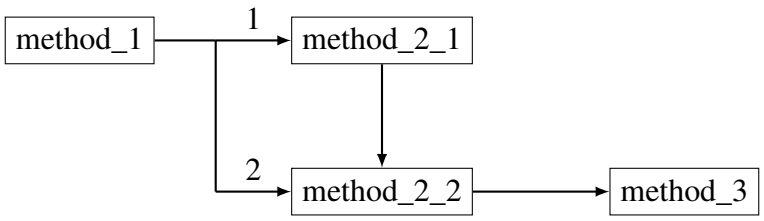
   Call `isEqual` to compare `"Cthulhu"` with `"Nyarlathotep"`, `"Lovecraft"` with `"Lovecraft"` and `"Howard"` with `new String("Howard")`.

   Which results did you get? Which of those were expected?

Task 2.2: One Missed Call

2 Points

Methods can call other Methods. Look at the following illustration and implement methods that call each other as illustrated:



For the first line of each method print `Enter <MethodName>` and for the last line of each method print `Exit <MethodName>` to the console. Before you call `method_1`, write your expected order down and then call `method_1` to compare the actual output to your expectations.

Task 2.3: Veni! Vidi! Vigor!

5 Points

Last time, you planned an algorithm for a vending machine. For this task you will need to implement the algorithm.

A quick reminder:

Your implementation should take one value of type **`int`**, subtract 72ct and output your change in coins to the console. Make sure that the change always uses highest value coins first (e.g. a change of 1€ should be output as `"1€"` and not `"50ct 50ct"`).

Available coins:

1ct, 2ct, 5ct, 10ct, 20ct, 50ct, 1€, 2€

Make sure to also implement the way you proposed to ensure the algorithms functionality.

Task 2.4: Landlubbers! 3 Points

Look at the following code-snippets and determine the scopes of the variables.

Example:

```
1  int x = 6;
2  int y = 7;
3  System.out.println(x * y);
```

Solution:
x: Line 1-3
y: Line 2-3

a) Determine the scopes of `testPassed` and `output`

```
1  boolean testPassed = pow(2,3) == 6;
2  String output = "";
3  if(testPassed){
4    output = "passed";
5  }
6  else{
7    output = "failed";
8  }
9  System.out.println(output);
```

b) Determine the scopes of `i` and `output`

```
1  int i = 100;
2  String output = "Testing is important!";
3  while(i > 0){
4    output+= output; //Same as output = output + output;
5    i-=1; //Same as i = i - 1;
6  }
7  System.out.println(output);
```

c) Determine the scopes of `testPassed` and `output`

```
1  boolean testPassed = pow(2,3) == 6;
2  if(testPassed){
3    String output = "passed";
4    System.out.println(output);
5  }
6  else{
7    String output = "failed";
8    System.out.println(output);
9  }
```