# 3.

6pts Correct | 0 pts Unanswered | 0 pts Incorrect

**[6 points]** Perform 2 iterations (2 base changes where the initial base is not counted) of the simplex algorithm over the given linear program below.

$$\max -3x_1 + 4x_2 - 3x_3$$

$$-2x_1 + 2x_3 \leq 4$$

$$-3x_1 + 2x_2 \leq 6$$

$$2x_1 + 2x_2 - 4x_3 \leq 4$$

$$x_1 \geq 0, x_2 \geq 0, x_3 \geq 0$$

As a solution after a given number of iterations enter:

- the status of the problem solution as a **status** variable meaning: -1 for a detected infeasible problem, 0 for a detected unbounded problem, 1 for an optimally solved problem, 2 for an undetermined status (needs further iterations)
- Your final simplex tableau into a two-dimensional field **tableau**. The field is expressed as a list composed of sublists in the python language,
- vector of the final point solution as a **solution** list in the python language (it should contain the values of **all** variables in the simplex table),
- the amount of the optimal objective function of the initial problem as a variable **obj** containing a decimal number

If the status is -1 or 0, the evaluated values inside **solution** and **obj** will not be looked at, but still define them in the solution to the right dimensions (important for the evaluator) and fill with zeros. If the status is 2, enter the current solution and its objective function value.

If you get a final solution in fewer iterations than the default, use that solution as input.

The numerical tolerance is $10^{-2}$.

An example of a valid solution entry format (not an exact solution to the task, not even the size of the dimensions):

```
status = 1

tableau = [
[0,0,1,2,20],
[1,0,-3,7,8.8],
[0,1,4,-2.3,23]
]

solution = [0,0,0,0]

obj = -1
```

## Note

You **must not** add additional variables, functions, etc.

- Only requested variables are expected
- You must define all variables, even if they are empty, otherwise your tests will fail!
- If you have additional variables, functions or classes, all your tests will fail!

Upload photos of the procedure for this task in a separate exam

- You will receive 0 points if you do not have uploaded photos of the process of solving this task from the signed paper

```
1 status = 2
2
3 tableau = [
```

Run

Save

```
  [-4.25,0,0,0,2.25,-0.25,12.5],
5 [0.5,0,0,1,-0.5,0.5,3],
6 [-1.25,0,1,0,0.25,-0.25,0.5],
7 [-1.5,1,0,0,0.5,0,3]
8 ]
9
10 solution = [0,3,0.5,3,0,0]
11
12 obj = 10.5
13
```

| Correct | Incorrect | Partial | Unanswered | Score | Score % | Hint |
|---|---|---|---|---|---|---|
| | | ✓ | | 5.4 | 90 | Partial score |

**Status: Finished**

Started at: November 18th 2024, 9:11:29 pm | Finished at: 9:11:30 pm | Duration: 793 ms

| Language | Compiler options | Compiler output | Message(s) |
|---|---|---|---|
| Python (3.8.1) | | | |

# Tests(9):

## 1. Correct

## 2. Correct

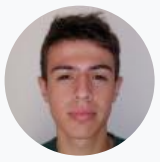
## 3. Correct

| | |
|---|---|
| stdin | 1 |
| stdout | OK↵ |
| expected | OK |
| diff | OK⇌ |
| stderr | null |

## 4. Correct

| | |
|---|---|
| stdin | 2 |
| stdout | OK↵ |
| expected | OK |
| diff | OK⇌ |
| stderr | null |





Ante Čavar
ac54081@fer.hr
0036540817

| | |
|---|---|
| stdout | OK↵ |
| expected | OK |
| diff | OK⇌ |
| stderr | null |

6. Incorrect -10.00% Hint: Incorrect output

7. Correct

| | |
|---|---|
| stdin | 4 |
| stdout | OK↵ |
| expected | OK |
| diff | OK⇌ |
| stderr | null |

8. Correct

9. Correct