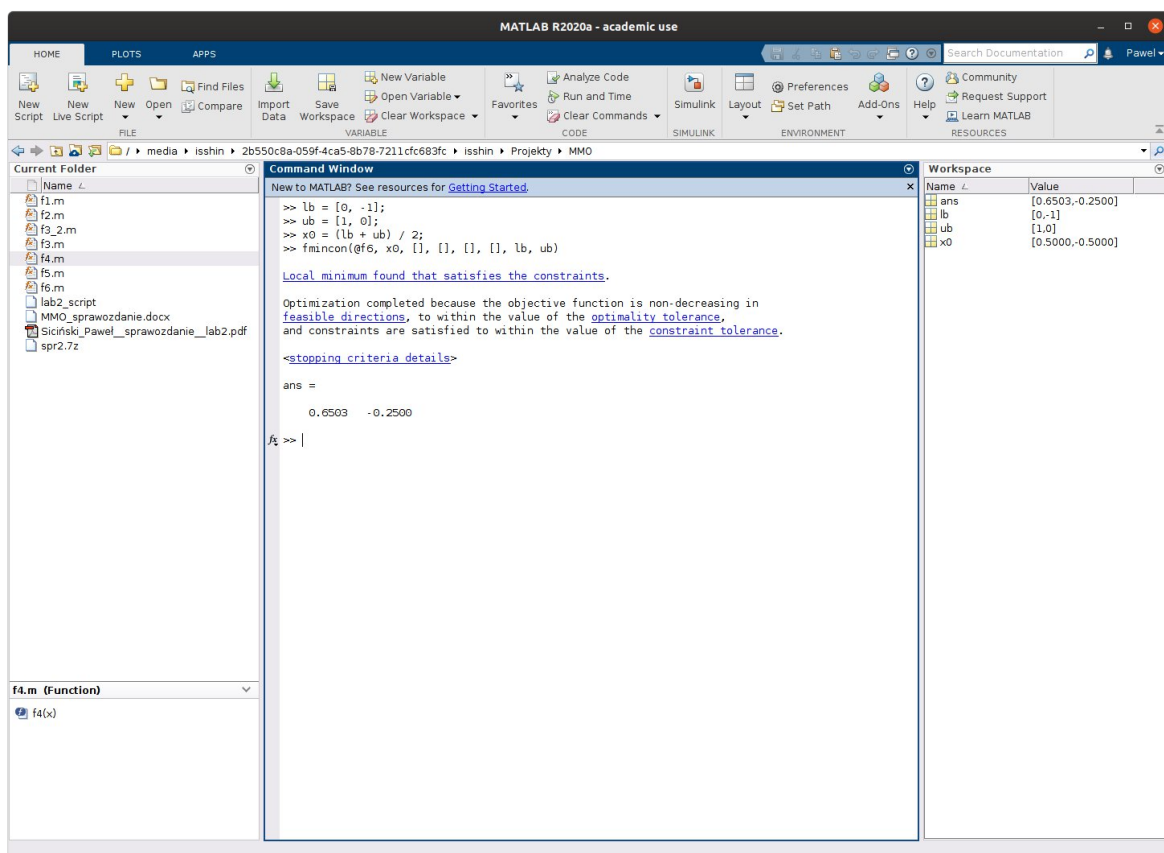
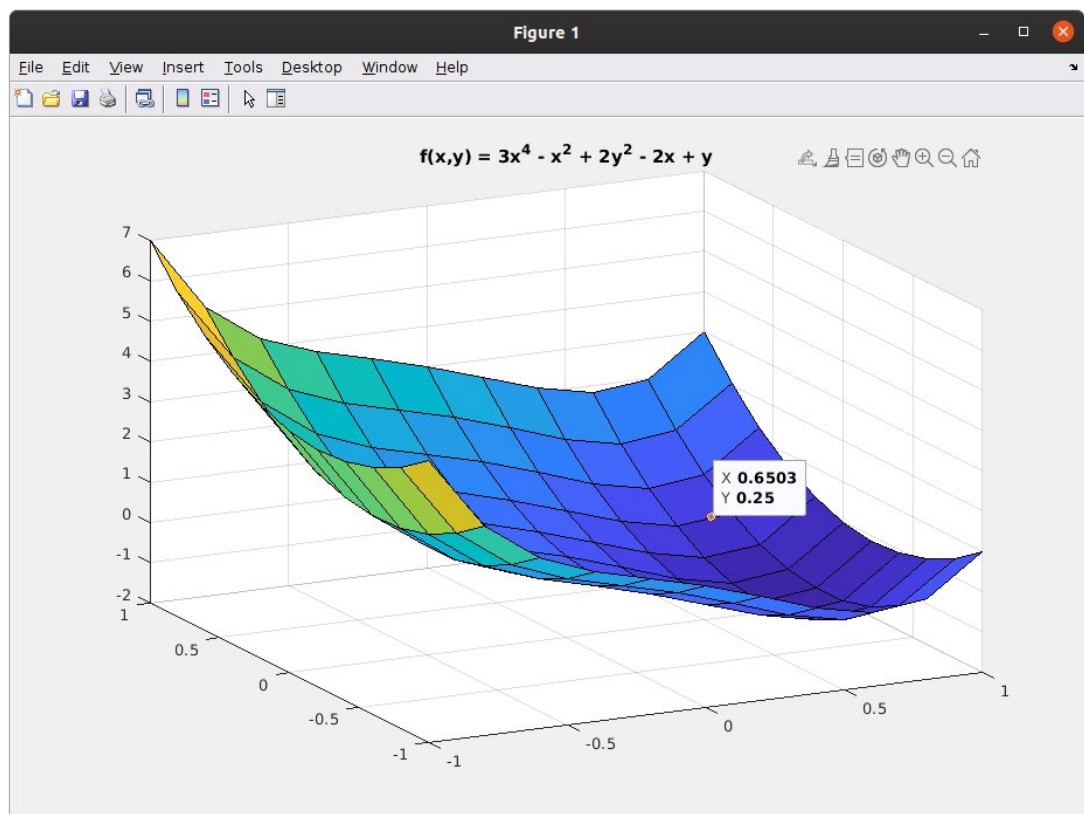


Matematyczne metody optymalizacji
Sprawozdanie: laboratorium nr 3
Siciński Paweł

$$f(x, y) = 3x^4 - x^2 + 2y^2 - 2x + y$$

$$x \geq 0, y \leq 0$$





$$x + y = 0, x \leq 1, y \geq 10$$

MATLAB R2020a - academic use

Current Folder: /media/issin/2b550c8a-059f-4ca5-8b78-7211cfc683fc/issin/Projekty/MMO

Command Window:

```
>> clear lb
>> clear ans
>> ub = [1, 10];
>> Aeq = [1, 1];
>> beq = [0];
>> x0 = ub / 2;
>> fmincon(@f6, x0, [], [], Aeq, beq)

Local minimum found that satisfies the constraints.

Optimization completed because the objective function is non-decreasing in
feasible directions, to within the value of the optimality tolerance,
and constraints are satisfied to within the value of the constraint tolerance.

<stopping criteria details>

ans =

    0.5424    -0.5424

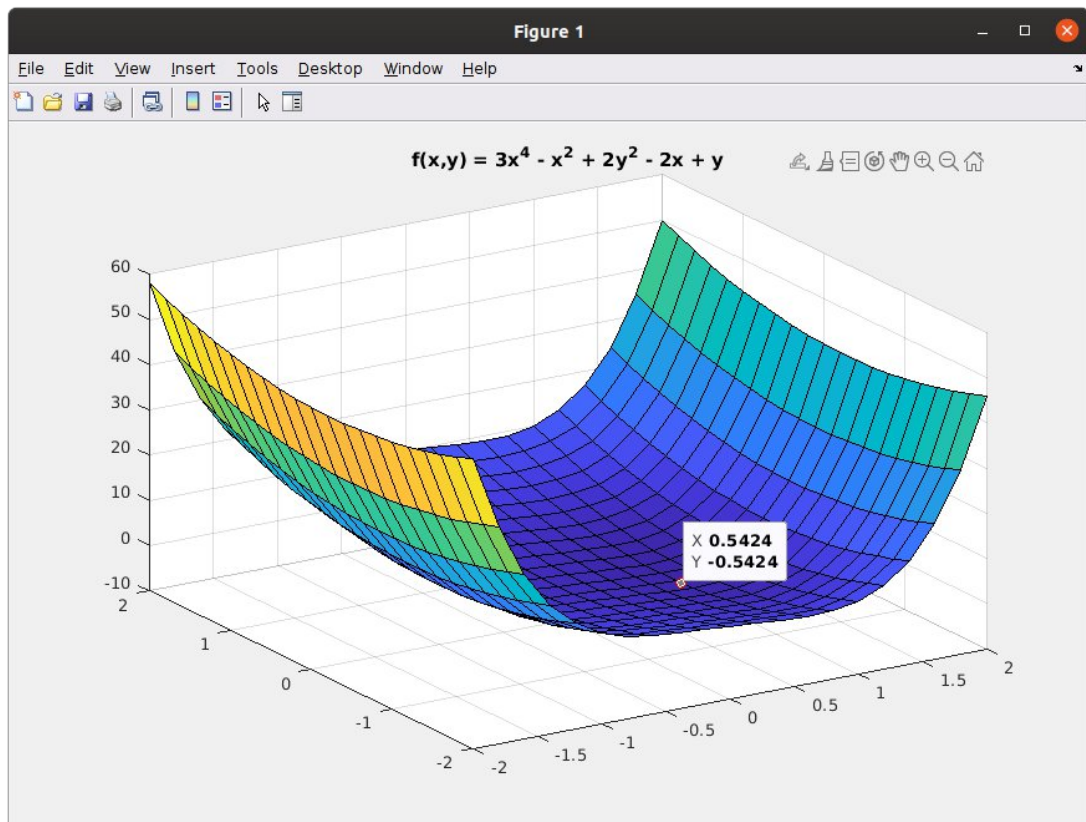
f6 >> |
```

Workspace:

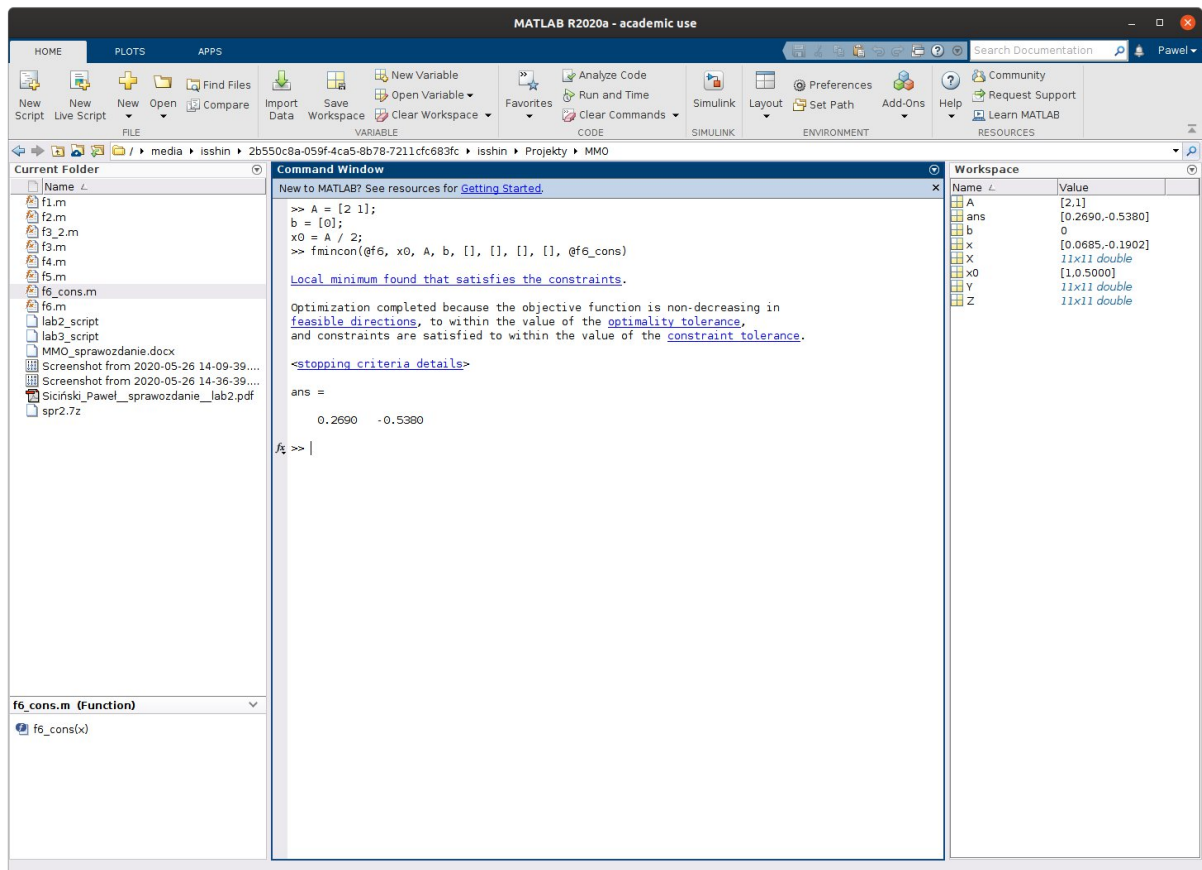
Name	Value
Aeq	[1,1]
ans	[0.5424, -0.5424]
beq	0
ub	[1,10]
x0	[0.5000, 5]

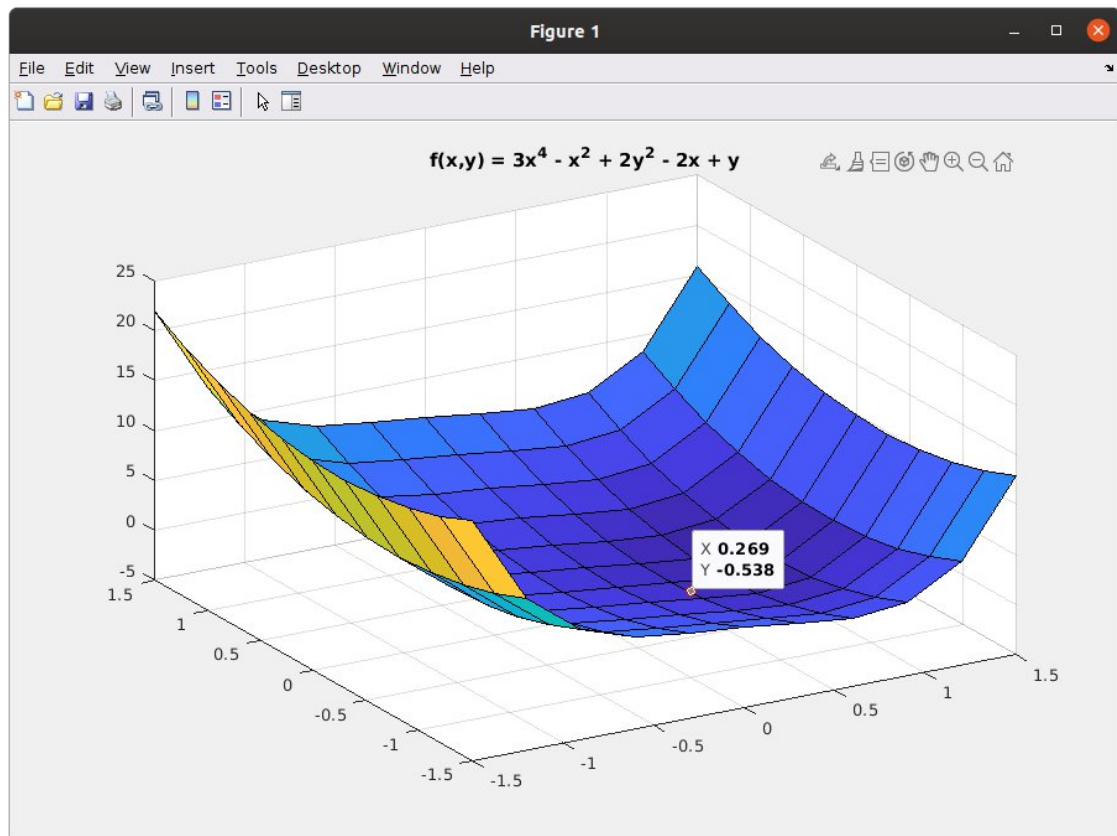
f4.m (Function)

f4(x)

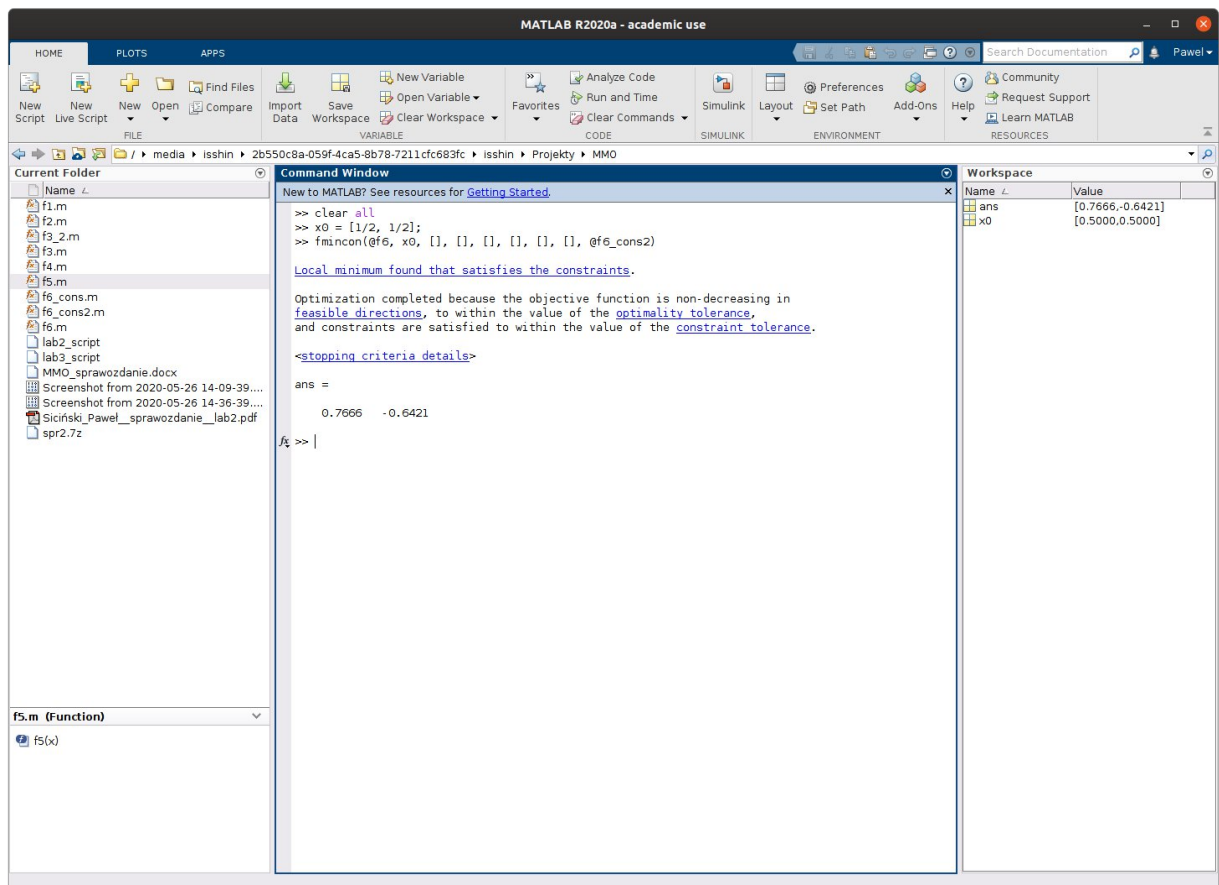


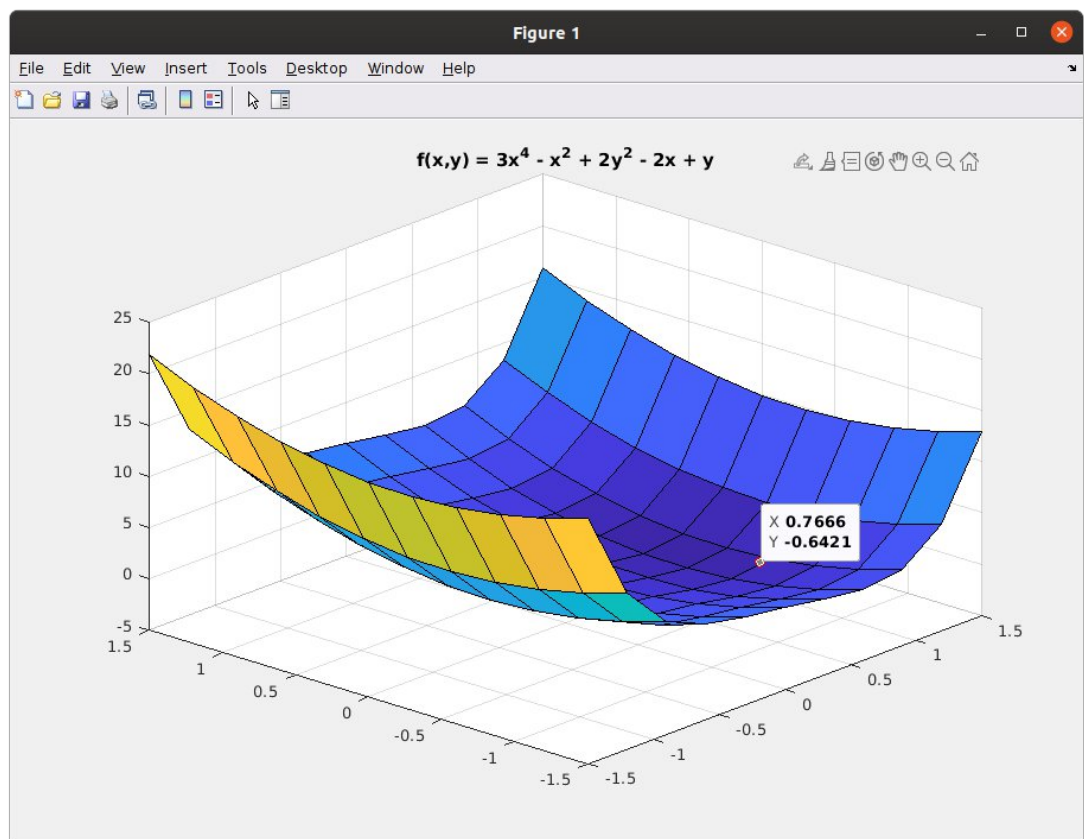
$$2x + y \leq 0, x^2 + 3y^2 \leq 1$$





$$x^2 + y^2 = 1$$





Zagadnienie optymalizacji zysku

Funkcja celu: $f(x_1, x_2) = -150x_1 - 300x_2$

The screenshot shows the MATLAB R2020a - academic use interface. The Command Window displays the following code and output:

```
>> f = [-150 -300];
A = [15 35; 0.5 0; 0.1 0.3; 2 5];
b = [800; 25; 75; 450];
lb = [0 0];
[x,fval,exitflag,output,lambda] = linprog(f, A, b, [], [], lb);

Optimal solution found.

>> disp(x)
50.0000
1.4286

>> disp(output)
iterations: 2
constrviolation: 1.1369e-13
message: 'Optimal solution found.'
algorithm: 'dual-simplex'
firstorderopt: 9.7446e-13

>> A * x
ans =
800.0000
25.0000
5.4286
107.1429

f >> |
```

The Workspace window shows the following variables:

Name	Value
A	[15,35;0.5000;0.1000;2.0000]
ans	[800.0000;25.0000;5.4286;107.1429]
b	[800;25;75;450]
exitflag	1
fval	-7.9286e+03
lambda	1x1 struct containing: lambda
lb	[0.0]
output	1x1 struct containing: iterations, constrviolation, message, algorithm, firstorderopt
x	[50.0000;1.4286]

Interpretacja:

	zasoby zużywane		zasoby potrzebne	zasoby maksymalne
	krzesło	stół		
drewno	15	35	800	800
materiał	0.5	0	25	25
klej	0.1	0.3	6	75
roboczogodziny	2	5	108	450