***Muhammad al-Xorazmiy nomidagi Toshkent axborot texnologiyalari Universiteti***



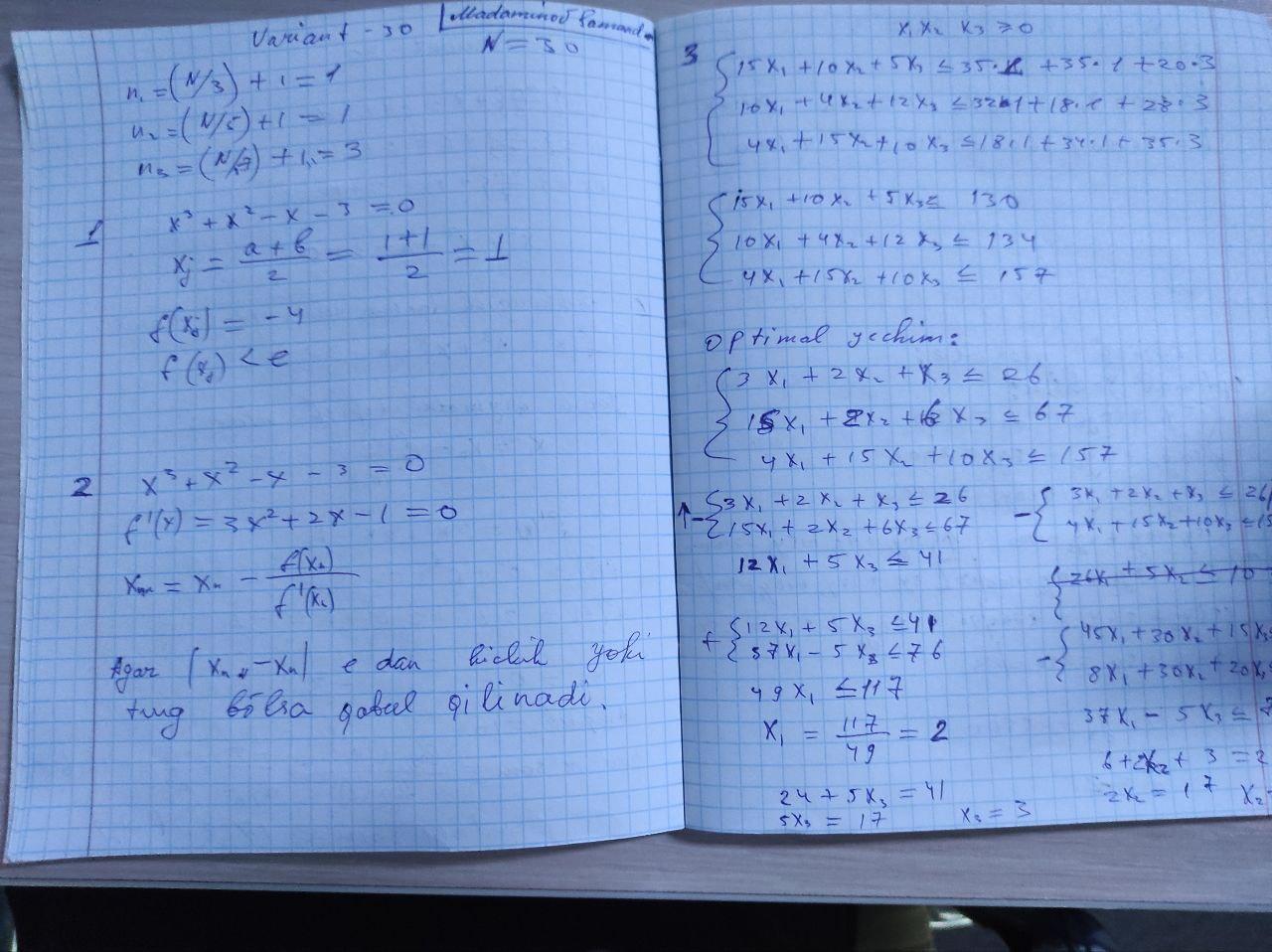
**Algoritmlarni Loyihalash Fanidan**

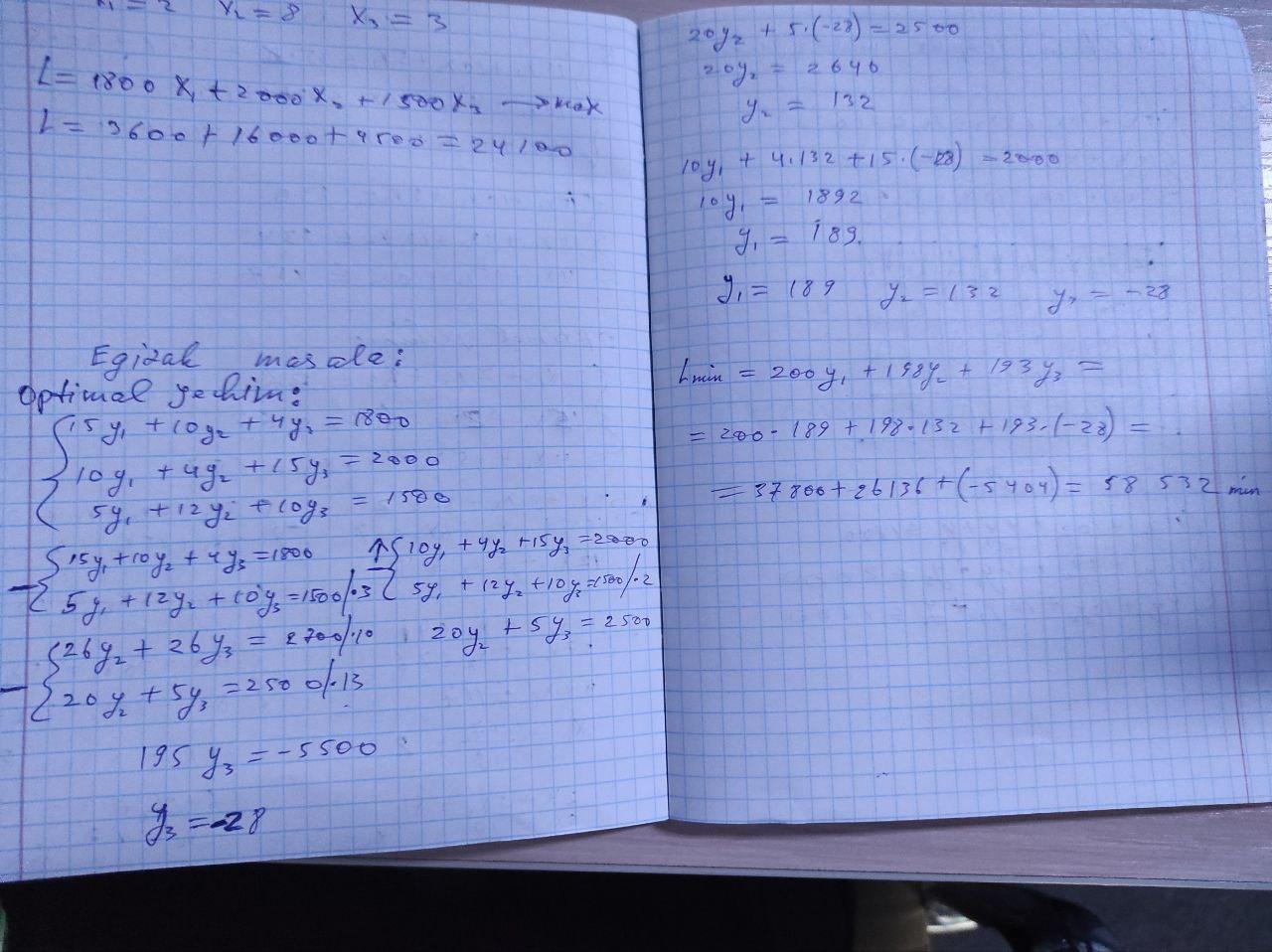
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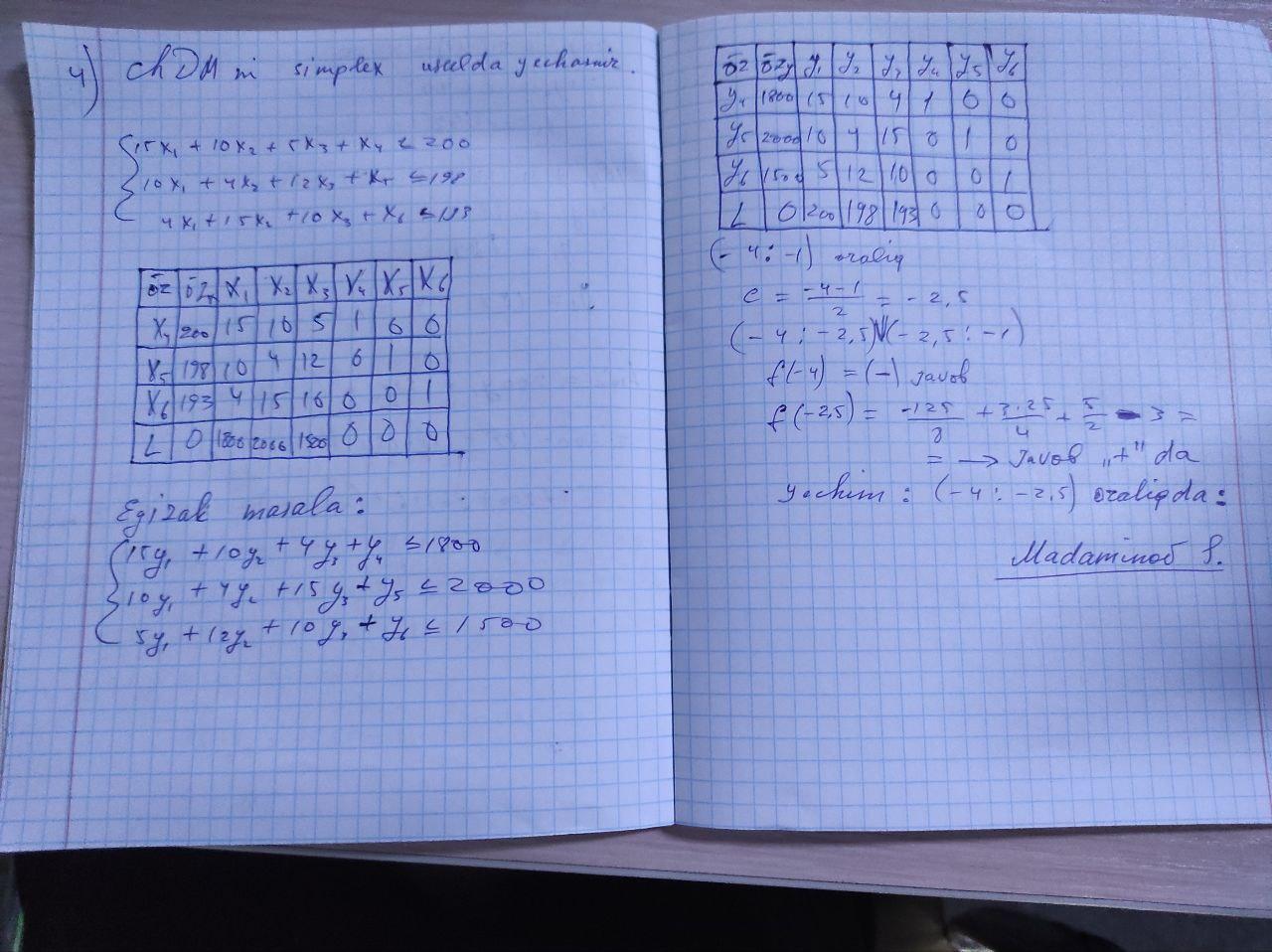
variant-30

Bajardi: Madaminov Samandar

Tekshirdi:Matyakubov Marks







**1- Savolning dastur kodini tuzamiz:**

**def f(x):**

**return x\*\*3 + x\*\*2 - x - 3**

**def bisection\_method(a, b, tol):**

**if f(a) \* f(b) >= 0:**

**print("Boshlang'ich farazanda x <= a va b, muammosi hal etilmaydi")**

**return None**

**num\_iterations = 0**

**while (b - a) / 2 > tol:**

**midpoint = (a + b) / 2**

**if f(midpoint) == 0:**

**return midpoint**

**elif f(a) \* f(midpoint) < 0:**

**b = midpoint**

**else:**

**a = midpoint**

**num\_iterations += 1**

**return (a + b) / 2, num\_iterations**

**a = 1**

**b = 2**

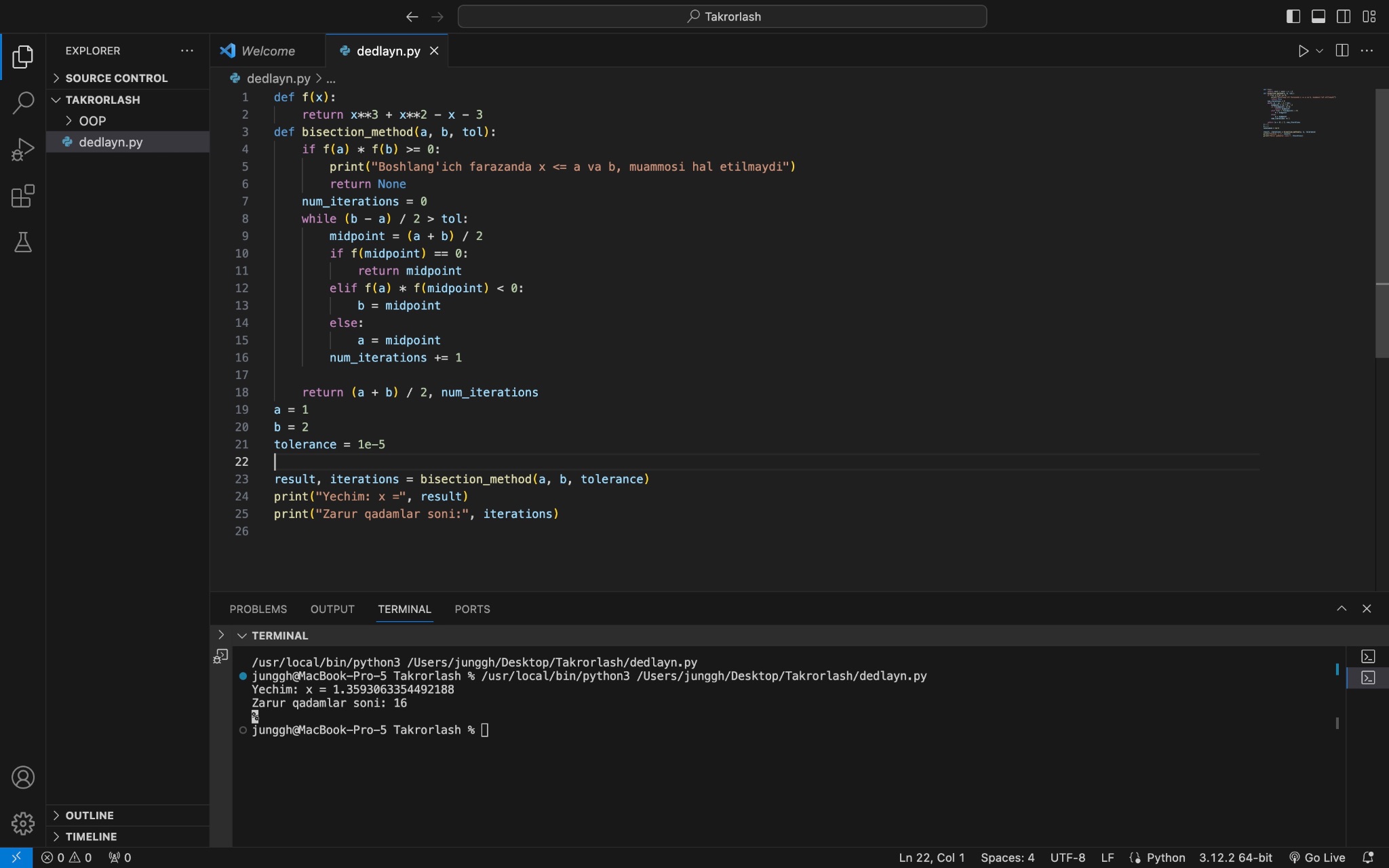
**tolerance = 1e-5**

**result, iterations = bisection\_method(a, b, tolerance)**

**print("Yechim: x =", result)**

**print("Zarur qadamlar soni:", iterations)**

**Natija:**

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**2-Savolning dastur kodi:**

**def f(x):**

**return x\*\*3 + x\*\*2 - x - 3**

**def f\_prime(x):**

**return 3\*x\*\*2 + 2\*x - 1**

**def newton\_method(x0, tol, max\_iter):**

**x = x0**

**num\_iterations = 0**

**while abs(f(x)) > tol and num\_iterations < max\_iter:**

**x = x - f(x) / f\_prime(x)**

**num\_iterations += 1**

**return x, num\_iterations**

**def bisection\_method(a, b, tol):**

**if f(a) \* f(b) >= 0:**

**print("Boshlang'ich farazanda x <= a va b, muammosi hal etilmaydi")**

**return None**

**num\_iterations = 0**

**while (b - a) / 2 > tol:**

**midpoint = (a + b) / 2**

**if f(midpoint) == 0:**

**return midpoint**

**elif f(a) \* f(midpoint) < 0:**

**b = midpoint**

**else:**

**a = midpoint**

**num\_iterations += 1**

**return (a + b) / 2, num\_iterations**

**initial\_guess = 1.5**

**tolerance = 1e-5**

**max\_iterations = 100**

**result\_newton, iterations\_newton = newton\_method(initial\_guess, tolerance, max\_iterations)**

**print("Nyuton usuli natijasi: x =", result\_newton)**

**print("Zarur qadamlar soni:", iterations\_newton)**

**a = 1**

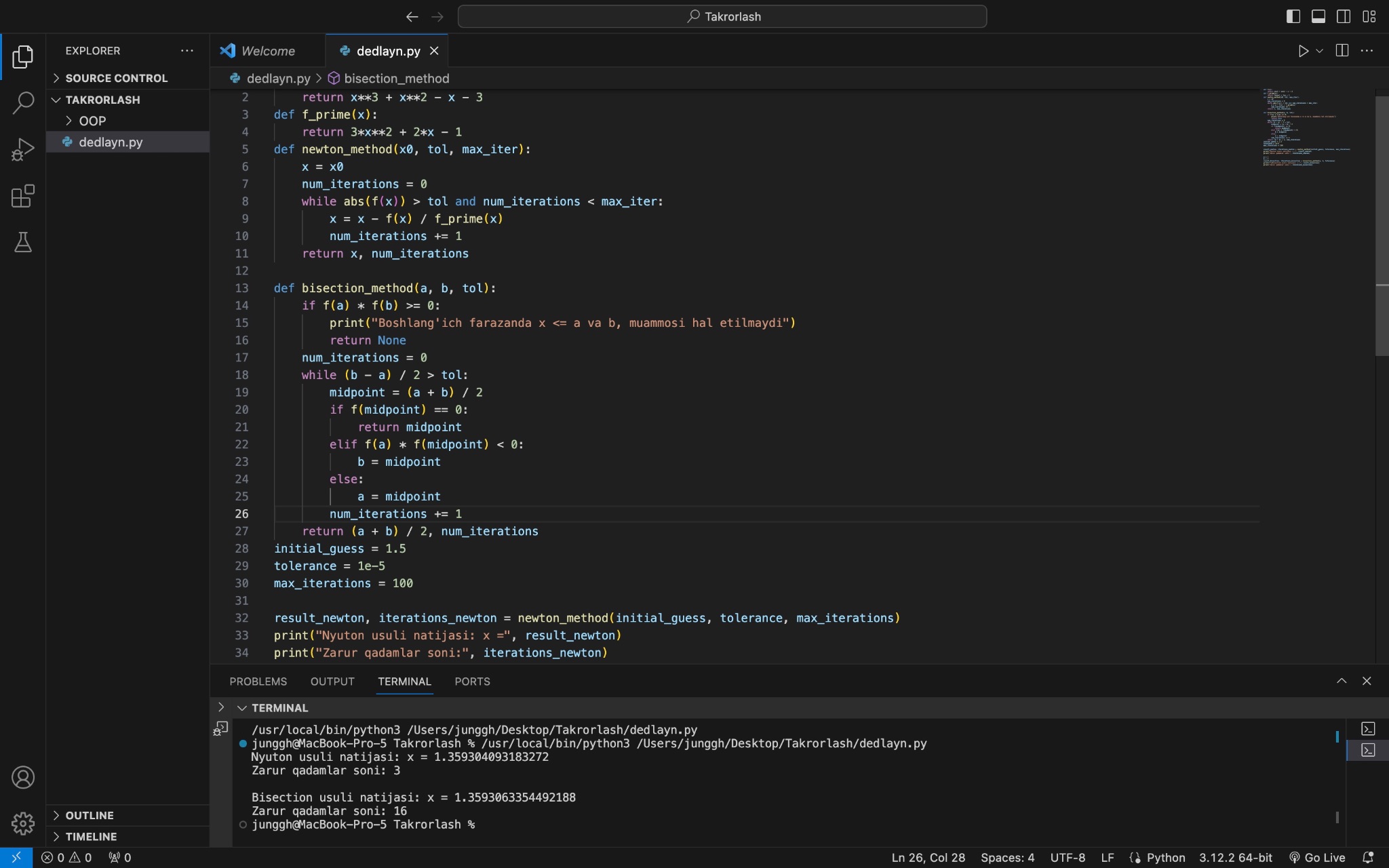
**b = 2**

**result\_bisection, iterations\_bisection = bisection\_method(a, b, tolerance)**

**print("\nBisection usuli natijasi: x =", result\_bisection)**

**print("Zarur qadamlar soni:", iterations\_bisection)**

**dastur natijasi:**

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