

Zadanie 10

Krzysztof Kozubek(c++)

Kod programu:

```
#include<iostream>
```

```
#include<cstdlib>
```

```
#include<cmath>
```

```
using namespace std;
```

```
const double eps = 1e-17;
```

```
static double functionValue(double x0, double y0){  
    return pow((2 - x0), 2) + 50 * pow((y0 - pow(x0, 2)), 2);  
}
```

```
static double functionXDerivativeValue(double x0, double y0){  
    return 2 * (100 * pow(x0, 3) + x0*(1 - 100 * y0) - 2);  
}
```

```
static double functionYDerivativeValue(double x0, double y0){  
    return 100 * (y0 - pow(x0, 2));  
}
```

```
bool showWynik(double x0, double y0){  
    double step = 0.25, valF, valSF, valDX, valDY, x, y;  
    int it = 0;  
  
    while (1){  
        valDX = functionXDerivativeValue(x0, y0);  
        valDY = functionYDerivativeValue(x0, y0);  
        x = x0 - (valDX*step);
```

```

        y = y0 - (valDY*step);

        valSF = functionValue(x, y);
        if (valSF<valF){
            if (abs(valSF - valF)<eps){
                cout << endl << "Wynik po " << it << " iteracjach:\nX : " << x <<
",      Y : " << y << endl;
                return true;
            }
            else{
                x0 = x;
                y0 = y;
                valF = valSF;
            }
        }
        else
            step /= 2;
        it++;
    }
}

```

```

void znajdzMin(double x0, double y0){

    double step = 0.25, valF, valSF, valDX, valDY, x, y;
    int it = 0;

    valF = functionValue(x0, y0);
    showWynik(x0, y0);
}

```

```

int main(){

```

```
double x, y;  
cout << "Podaj      X: ";  
cin >> x;  
cout << "Podaj      Y: ";  
cin >> y;  
  
znajdzMin(x, y);  
system("pause");  
return 0;  
}
```

Wynik po 128956 iteracjach:

X : 2, Y : 4