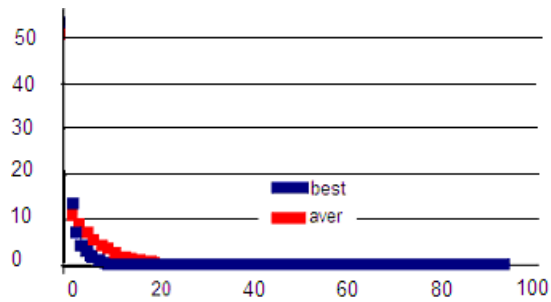


Boyka Dzmitry

$$y=\sin^6(5\pi x)$$



Code:

```
#include <stdafx.h>
#include <stdio.h>
#include <iostream>
#include <time.h>
#include <math.h>

using namespace std;

void main()
{
    int cros, Num1, Num2, i, j, temp, number;
    int selection[10][10];
    int parents[20][10];
    float y[20], x[20], x1;

    srand(time(NULL));
    for (i=0; i<20; i++)
    {
        for (j=0; j<10; j++)
        {
            parents[i][j]=rand()%2;
        }
    }

    for (i=0; i<20; i++)
    {
        x[i]=0;
        for (j=0; j<10; j++)
        {
            x[i]+=parents[i][j]*pow(2.0, (9-j));
        }
        x[i]=x[i]/1023;
        y[i]=pow(sin(5*3.14*x[i]), 6);
    }

    for (i=0; i<19; i++)
    {
        if (y[i]>y[i+1])
```

```

        {
            x1=y[i];
            y[i]=y[i+1];
            y[i+1]=x1;
            for (j=0; j<10; j++)
            {
                temp=parents[i][j];
                parents[i][j]=parents[i+1][j];
                parents[i+1][j]=temp;
            }
            i=0;
        }
    }

    FILE *pfile;
    pfile=fopen("text.txt", "w");

    for (i=0; i<20; i++)
    {
        for (j=0; j<10; j++)
        {
            cout<<parents[i][j]<<" ";
        }
        cout<<endl;
    }
    cout<<endl<<endl;
    number=0;

    do
    {
        for (i=0; i<20; i++)
        {
            fprintf(pfile, "\t%.10f\t%.10f\n", y[i], x[i]);
        }
        fprintf(pfile, "\n-----\n");

        for (i=0; i<10; i++)
            for (j=0; j<10; j++)
                selection[i][j]=parents[i][j];

        for (i=0; i<20; i++)
        {
            cros=rand()%8+1;
            Num1=rand()%10;
            Num2=rand()%10;
            for (j=0; j<10; j++)
            {
                if (j<cros)
                    parents[i][j]=selection[Num1][j];
                else
                    parents[i][j]=selection[Num2][j];
            }
        }

        for (i=0; i<20; i++)
        {
            x[i]=0;
            for (j=0; j<10; j++)
            {
                x[i]+=parents[i][j]*pow(2.0, (9-j));
            }
            x[i]=x[i]/1023;
            y[i]=pow(sin(5*3.14*x[i]), 6);
        }

        for (i=0; i<19; i++)

```

```

        {
            if (y[i]>y[i+1])
            {
                x1=y[i];
                y[i]=y[i+1];
                y[i+1]=x1;
                for (j=0; j<10; j++)
                {
                    temp=parents[i][j];
                    parents[i][j]=parents[i+1][j];
                    parents[i+1][j]=temp;
                }
                i=0;
            }
            number++;
        }

while (number!=15);

cout<<endl<<endl;
cout<<"-----"<<endl;
cout<<"Number of iter = "<<number<<endl;
cout<<"-----"<<endl;
fprintf(pfile,"\n-----\nNumber of
iteration = %d\n-----\n",number);

for (i=0; i<20; i++)
{
    for (j=0; j<10; j++)
    {
        cout<<parents[i][j]<<" ";
    }
    fprintf(pfile,"\t%.10f\t%.10f\n",y[i],x[i]);
    cout<<endl;
}
fclose(pfile);
system("pause");
}

```