Ver. BPM2
Status A
Author MK

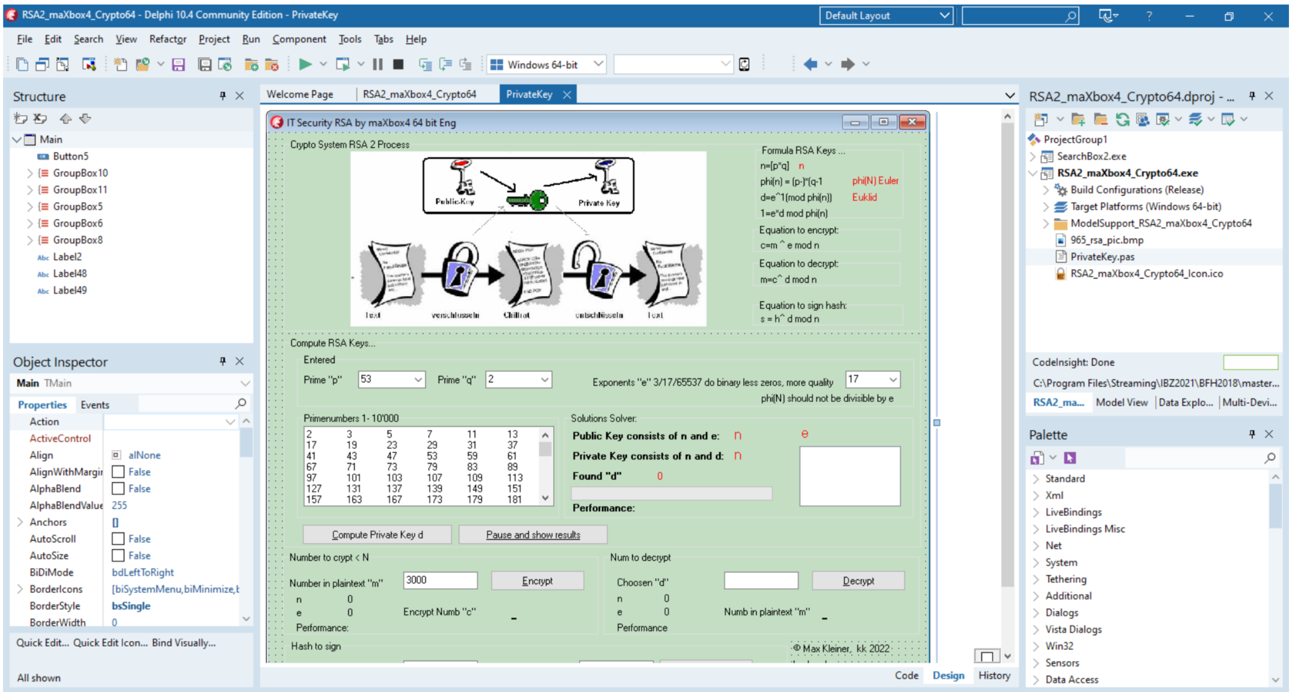
maXbox4
exe

Digital unterschrieben
von maXbox4exe
Datum: 2022.12.27
14:15:44 +01'00'

Compiler versus

Interpreter Science

maXbox Starter 102 C4I



RSA2_maXbox4_Crypto64 - Delphi 10.4 Community Edition - PrivateKey

IT Security RSA by maXbox4 64 bit Eng

Crypto System RSA 2 Process

Formula RSA Keys ...
n=[p*q] n
phi(n) = (p-)*(q-1 phi(N) Euler
d=e^1(mod phi(n)) Euklid
1=e*d mod phi(n)

Equation to encrypt:
c=m ^ e mod n

Equation to decrypt:
m=c^ d mod n

Equation to sign hash:
s = h^ d mod n

Compute RSA Keys...

Entered
Prime "p" 53 Prime "q" 2 Exponents "e" 3/17/65537 do binary less zeros, more quality 17
phi(N) should not be divisible by e

Primenumbers 1- 10'000

```
2     3     5     7     11    13
17    19    23    29    31    37
41    43    47    53    59    61
67    71    73    79    83    89
97    101   103   107   109   113
127   131   137   139   149   151
157   163   167   173   179   181
```

Solutions Solver:
Public Key consists of n and e: n e
Private Key consists of n and d: n
Found "d" 0
Performance:

Number to crypt < N
Number in plaintext "m" 3000
n 0
e 0 Encrypt Numb "c" -
Performance:

Num to decrypt
Choosen "d"
n 0
e 0 Numb in plaintext "m" -
Performance

Hash to sign

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Object Inspector
Main TMain
Properties Events

Action	
ActiveControl	
Align	alNone
AlignWithMargi	□ False
AlphaBlend	□ False
AlphaBlendValue	255
Anchors	[]
AutoScroll	□ False
AutoSize	□ False
BiDiMode	bdLeftToRight
BorderIcons	[biSystemMenu,biMinimize,b
BorderStyle	bsSingle
BorderWidth	0

Quick Edit... Quick Edit Icon... Bind Visually...
All shown

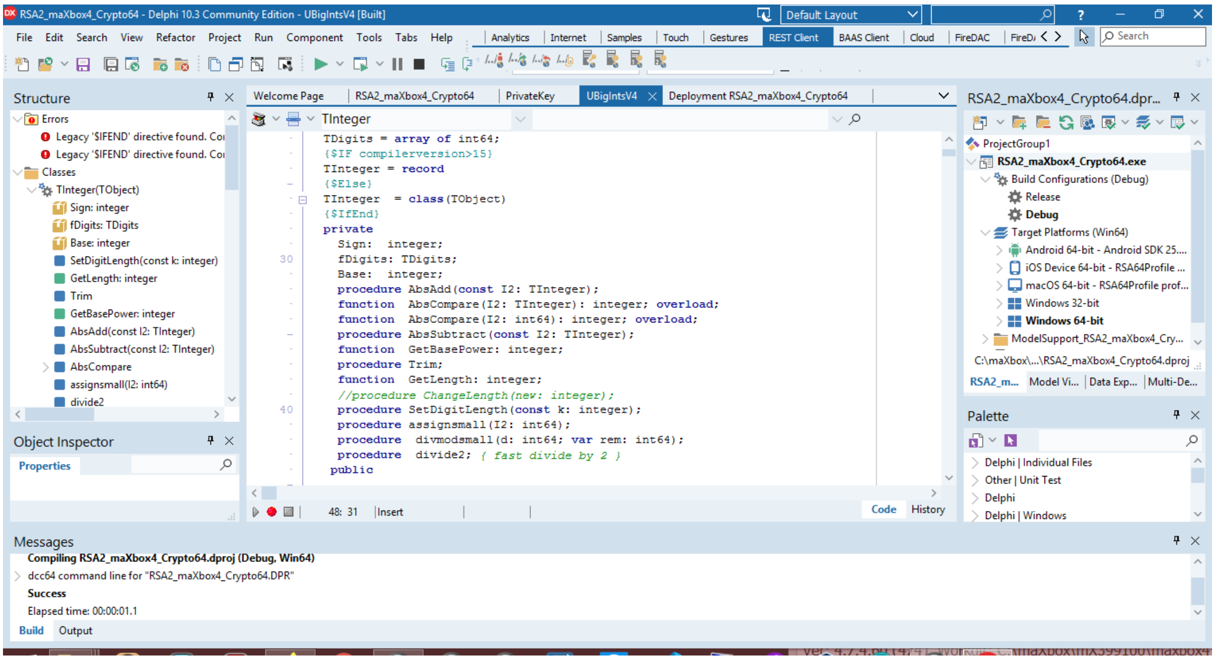
RSA2_maXbox4_Crypto64.dproj - ...
ProjectGroup1
SearchBox2.exe
RSA2_maXbox4_Crypto64.exe
Build Configurations (Release)
Target Platforms (Windows 64-bit)
ModelSupport_RSA2_maXbox4_Crypto64
965_rsa_pic.bmp
PrivateKey.pas
RSA2_maXbox4_Crypto64_Icon.ico

CodeInsight: Done
C:\Program Files\Streaming\IBZ2021\BFH2018\master...
RSA2_ma... Model View Data Explo... Multi-Devi...

Pic: cryptobox2_ide_tutor102.png

Links and Sources
Title
maXbox4/assets/cryptobox at master · maxkleiner/maXbox4 (github.com)
python4delphi/Tutorials/Webinar II at master · maxkleiner/python4delphi (github.com)

https://maxbox4.wordpress.com/

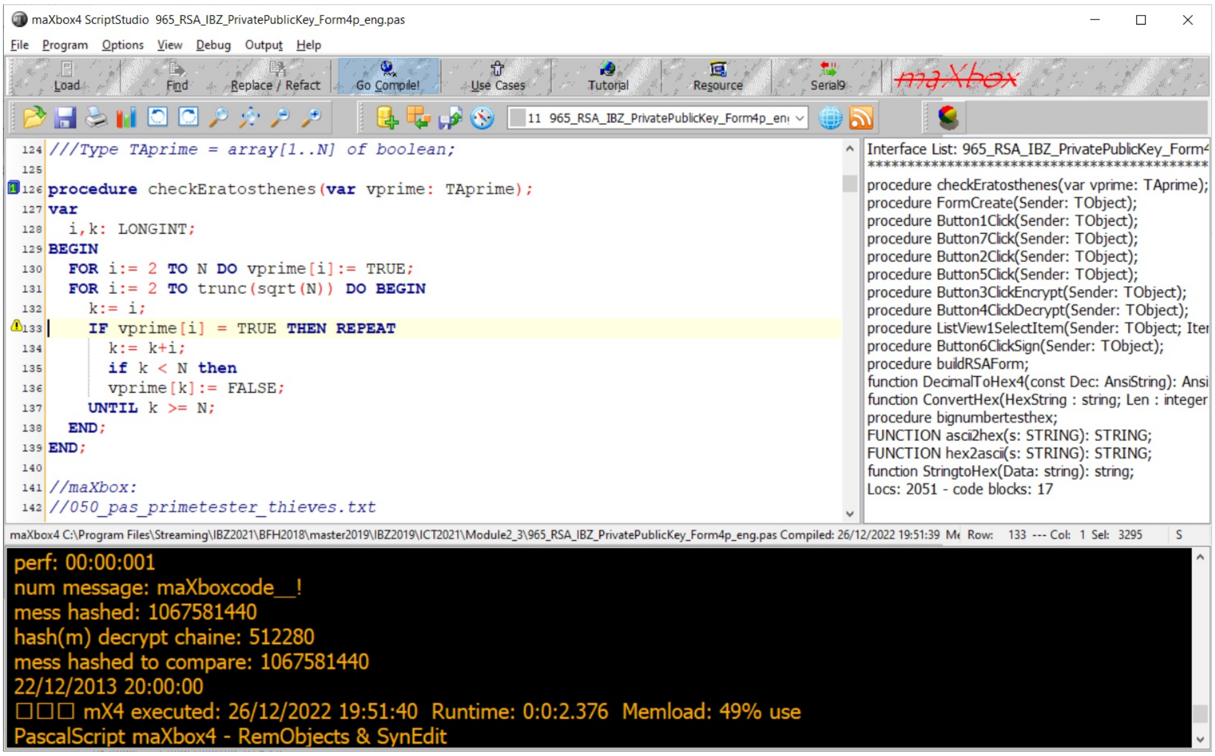

RSA2_maXbox4_Crypto64 - Delphi 10.3 Community Edition - UBigIntsV4 [Built]
Default Layout
File Edit Search View Refactor Project Run Component Tools Tabs Help
Analytics Internet Samples Touch Gestures REST Client BAAS Client Cloud FireDAC
Structure
Errors
Legacy '$IFEND' directive found. Co
Legacy '$IFEND' directive found. Co
Classes
TInteger(TObject)
Sign: integer
fDigits: TDigits
Base: integer
SetDigitLength(const k: integer)
GetLength: integer
Trim
GetBasePower: integer
AbsAdd(const I2: TInteger)
AbsSubtract(const I2: TInteger)
AbsCompare
assignsmall(I2: int64)
divide2
Object Inspector
Properties
Welcome Page
RSA2_maXbox4_Crypto64
PrivateKey
UBigIntsV4
Deployment RSA2_maXbox4_Crypto64
TInteger
48: 31
Insert
Code
History
RSA2_maXbox4_Crypto64.dpr...
ProjectGroup1
RSA2_maXbox4_Crypto64.exe
Build Configurations (Debug)
Release
Debug
Target Platforms (Win64)
Android 64-bit - Android SDK 25....
iOS Device 64-bit - RSA64Profile ...
macOS 64-bit - RSA64Profile prof...
Windows 32-bit
Windows 64-bit
ModelSupport_RSA2_maXbox4_Cry...
C:\maXbox\...\RSA2_maXbox4_Crypto64.dproj
RSA2_m... Model Vi... Data Exp... Multi-De...
Palette
Delphi | Individual Files
Other | Unit Test
Delphi
Delphi | Windows
Messages
Build
Output

```
TDigits = array of int64;
{$IF compilerversion>15}
TInteger = record
{$Else}
TInteger  = class(TObject)
{$IfEnd}
private
  Sign:  integer;
  fDigits: TDigits;
  Base:  integer;
  procedure AbsAdd(const I2: TInteger);
  function  AbsCompare(I2: TInteger): integer; overload;
  function  AbsCompare(I2: int64): integer; overload;
  procedure AbsSubtract(const I2: TInteger);
  function  GetBasePower: integer;
  procedure Trim;
  function  GetLength: integer;
  //procedure ChangeLength(new: integer);
  procedure SetDigitLength(const k: integer);
  procedure assignsmall(I2: int64);
  procedure  divmodsmall(d: int64; var rem: int64);
  procedure  divide2; { fast divide by 2 }
 public
```

```
Compiling RSA2_maXbox4_Crypto64.dproj (Debug, Win64)
dcc64 command line for "RSA2_maXbox4_Crypto64.DPR"
Success
Elapsed time: 00:00:01.1
```

965_RSA_Demolab2DelphiIDE.png

RAD Studio 11.4, maXbox4 or Python 3.8


maXbox4 ScriptStudio 965_RSA_IBZ_PrivatePublicKey_Form4p_eng.pas
File Program Options View Debug Output Help
Load
Find
Replace / Refact
Go Compile!
Use Cases
Tutorial
Resource
Serial9
maXbox
11 965_RSA_IBZ_PrivatePublicKey_Form4p_eng

```
///Type TAprime = array[1..N] of boolean;

procedure checkEratosthenes(var vprime: TAprime);
var
  i,k: LONGINT;
BEGIN
  FOR i:= 2 TO N DO vprime[i]:= TRUE;
  FOR i:= 2 TO trunc(sqrt(N)) DO BEGIN
    k:= i;
    IF vprime[i] = TRUE THEN REPEAT
      k:= k+i;
      if k < N then
      vprime[k]:= FALSE;
    UNTIL k >= N;
  END;
END;

//maXbox:
//050_pas_primetester_thieves.txt
```

```
Interface List: 965_RSA_IBZ_PrivatePublicKey_Form4
*********************************************************
procedure checkEratosthenes(var vprime: TAprime);
procedure FormCreate(Sender: TObject);
procedure Button1Click(Sender: TObject);
procedure Button7Click(Sender: TObject);
procedure Button2Click(Sender: TObject);
procedure Button5Click(Sender: TObject);
procedure Button3ClickEncrypt(Sender: TObject);
procedure Button4ClickDecrypt(Sender: TObject);
procedure ListView1SelectItem(Sender: TObject; Iter
procedure Button6ClickSign(Sender: TObject);
procedure buildRSAForm;
function DecimalToHex4(const Dec: AnsiString): Ansi
function ConvertHex(HexString : string; Len : integer
procedure bignumbertesthex;
FUNCTION ascii2hex(s: STRING): STRING;
FUNCTION hex2ascii(s: STRING): STRING;
function StringtoHex(Data: string): string;
Locs: 2051 - code blocks: 17
```

maXbox4 C:\Program Files\Streaming\IBZ2021\BFH2018\master2019\IBZ2019\ICT2021\Module2_3\965_RSA_IBZ_PrivatePublicKey_Form4p_eng.pas Compiled: 26/12/2022 19:51:39 Me Row: 133 --- Col: 1 Sel: 3295 S

```
perf: 00:00:001
num message: maXboxcode__!
mess hashed: 1067581440
hash(m) decrypt chaine: 512280
mess hashed to compare: 1067581440
22/12/2013 20:00:00
□□□ mX4 executed: 26/12/2022 19:51:40  Runtime: 0:0:2.376  Memload: 49% use
PascalScript maXbox4 - RemObjects & SynEdit
```

Pic: cryptobox2_mX4_tutor102.png

1 From Interpreter to Compiler

1.1 Code Exploration with cryptobox4

Both compilers and interpreters are used to convert a program written in a high-level language into machine code understood by computers.

Interpreters usually take less amount of time to analyze the source code. However, the overall execution time is comparatively slower than compilers. A compiler scans the entire program and translates it from object code as a whole into machine code.

The procedure template for the comparison goes like this:

```
procedure checkEratosthenes(var vprime: TAprime);
var
  i,k: LONGINT;
BEGIN
  FOR i:= 2 TO N DO vprime[i]:= TRUE;
  FOR i:= 2 TO trunc(Sqrt(N)) DO BEGIN
    k:= i;
    IF vprime[i] = TRUE THEN REPEAT
      k:= k+i;
      if k < N then
      vprime[k]:= FALSE;
    UNTIL k >= N;
  END;
END;
```

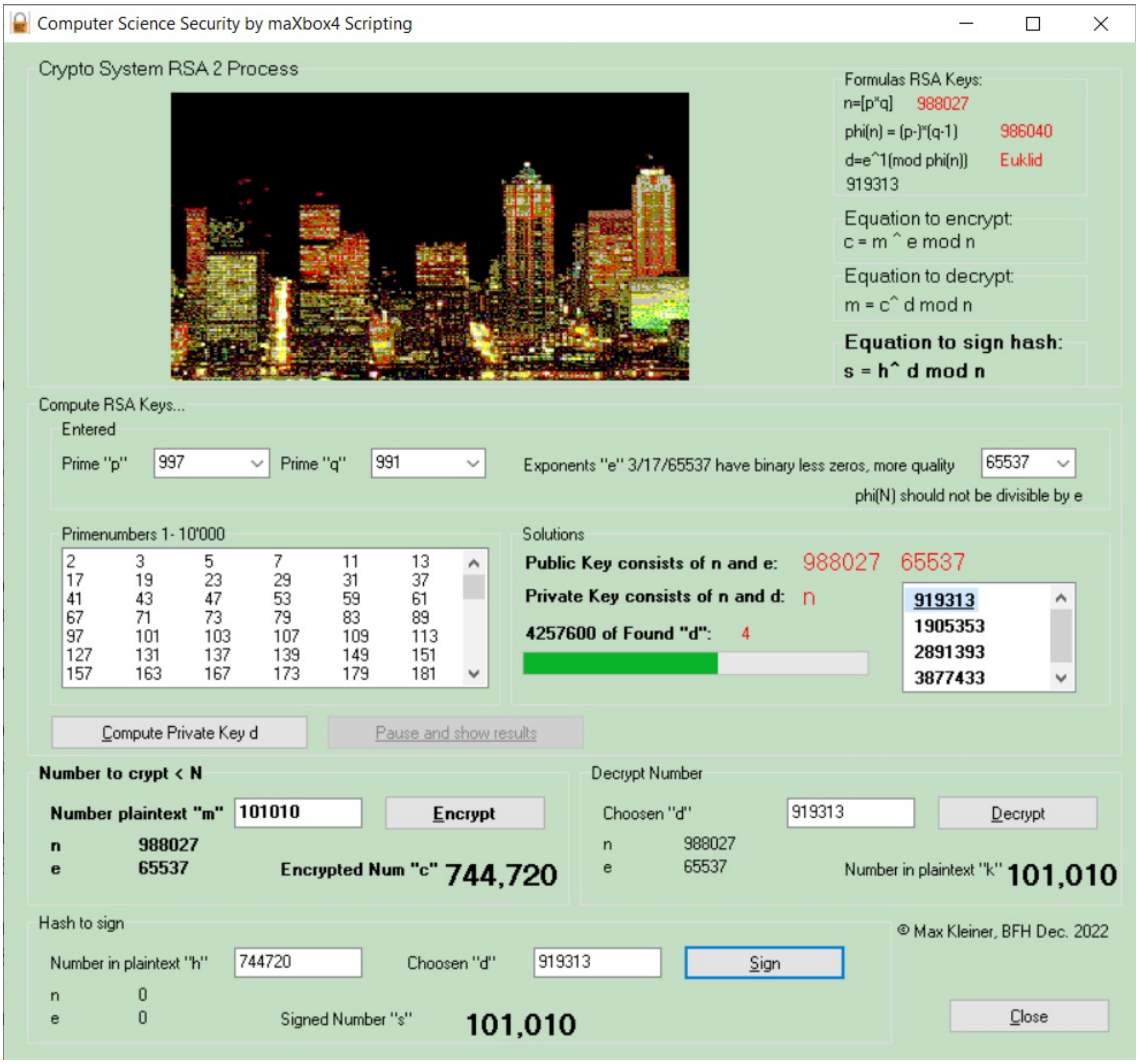
The compiler produces an output, which is typically much faster at running your program than the interpreter - maybe 15x faster. But a compiler does not run your program (it builds the program), hence it makes no sense to compare it to an interpreter which IS running your program or script:

```
965_RSA_IBZ_PrivatePublicKey_Form4p_eng.pas
22/12/2013 20:00:00
### mX4 executed: 26/12/2022 21:08:37  Runtime: 0:0:2.530  Memload:
52% use
PascalScript maXbox4 - RemObjects & SynEdit
Ver: 4.7.6.20 (476). Workdir: C:\Program
Files\Streaming\IBZ2021\Module2_3
```

To perform an instruction written in high-level language via computer, we need to convert it into machine language. To do this, either a compiler or an interpreter, or both are used to convert a source code programming language into machine code.
The drawback of using a compiler is that you can only make changes in the program by going back to your source code.

First we get the source-code data with maXbox by decompile():

```
[PROCS]
Proc [0] Export: !MAIN -1
 [0] RET
Proc [1] Export: FORMCREATE -1 @53
 [0] ASSIGN GlobalVar[91], [0]
 [15] ASSIGN GlobalVar[90], [0]
 [30] PUSHTYPE 33(U8) // 1
 [35] ASSIGN Base[1], [1]
 [47] PUSHTYPE 37(Class) // 2
 [52] ASSIGN Base[2], GlobalVar[89]
 [63] CALL 13
 [68] POP // 1
 [69] POP // 0
 [70] ASSIGN GlobalVar[88], [0]
 [82] PUSHTYPE 24(String) // 1
 [87] ASSIGN Base[1], ['form create call
open...']
 [126] CALL 14
 [131] POP // 0
 [132] RET
Proc [2] Export: BUTTON1CLICK -1 @53
 [0] PUSHTYPE 54(Class) // 1
 [5] PUSHTYPE 56(Class) // 2
 [10] PUSHTYPE 56(Class) // 3)
[#P#R#O#C#S#]#
```


Computer Science Security by maXbox4 Scripting
Crypto System RSA 2 Process
Compute Private Key d
Pause and show results
Encrypt
Decrypt
Sign
Close

Formulas RSA Keys:
n=[p*q] 988027
phi(n) = (p-)*(q-1) 986040
d=e^1(mod phi(n)) Euklid
919313

Equation to encrypt:
c = m ^ e mod n

Equation to decrypt:
m = c^ d mod n

Equation to sign hash:
s = h^ d mod n

Compute RSA Keys...

Entered

Prime "p" 997 Prime "q" 991 Exponents "e" 3/17/65537 have binary less zeros, more quality 65537

phi(N) should not be divisible by e

Primenumbers 1- 10'000

```
2     3     5     7     11    13
17    19    23    29    31    37
41    43    47    53    59    61
67    71    73    79    83    89
97    101   103   107   109   113
127   131   137   139   149   151
157   163   167   173   179   181
```

Solutions

Public Key consists of n and e: 988027 65537

Private Key consists of n and d: n

4257600 of Found "d": 4

```
919313
1905353
2891393
3877433
```

Number to crypt < N

Number plaintext "m" 101010

n 988027
e 65537

Encrypted Num "c" 744,720

Decrypt Number

Choosen "d" 919313

n 988027
e 65537

Number in plaintext "k" 101,010

Hash to sign

Number in plaintext "h" 744720 Choosen "d" 919313

n 0
e 0

Signed Number "s" 101,010

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Pic: cryptobox2inter_tutor102.png - Interpreter

Or alternate sources

```
begin  //@main

{srlist:= TStringlist.create;
if
LoadDFMFile2Strings('C:\maXbox\softwareschule\IBZ_2016\IBZ_IT_Security_2016
\DVD Inhalt\RSA Berechnung\PrivateKey.dfm',srlist, abt)= 0 then
    writeln(srlist.text);
    srlist.Free;   // }

    //encrypt: m^e mod n = 9^7 mod 143 =48=c;
    //decrypt: c^d mod n = 48^103 mod 143 =9=m;

  message:='Rosetta Code!';
  print('message                 '+message)
  writeln('hex data: '+strtoHex1(message))
  writeln(Hextostr(strtoHex1(message)))
  hexmess:= strtoHex1(message)

  abig:= TInteger.create(1);
  abig.Assignhex(hexmess);
  writeln('big plain text integer: '+abig.Tostring(normal))
  //writeln(asciitohex(hexmess));
```

Python

```
import numpy as np
import pandas as pd
from io import StringIO
import matplotlib.pyplot as plt
import seaborn as sns
df = sns.load_dataset("penguins")
sns.pairplot(df, hue="species")
figfile = StringIO()
plt.savefig(figfile, format="svg")
plt.show()
print(df.info())
```

The interpreter makes it easier to work with source code. So it is highly preferred, especially for beginners. Interpreted programs can run on only those computers which have the same interpreter.

1.2 Compiler variance

“Covariance” indicates the direction of the linear relationship between variables. “Correlation” on the other hand measures both the strength and direction of the linear relationship between two variables.

```
function SHA1FromFile(const filename: string): string;
var SHA1: TIdHashSHA1;
    fs: TFileStream;
begin
  SHA1:= TIdHashSHA1.Create;
  fs:= TFileStream.Create(fileName, fmOpenRead or fmShareDenyWrite);
  try
    result:= SHA1.AsHex(SHA1.hashvalue1((fs),0,fs.size));
  finally
    SHA1.Free;
    fs.Free;
  end;
end;
```

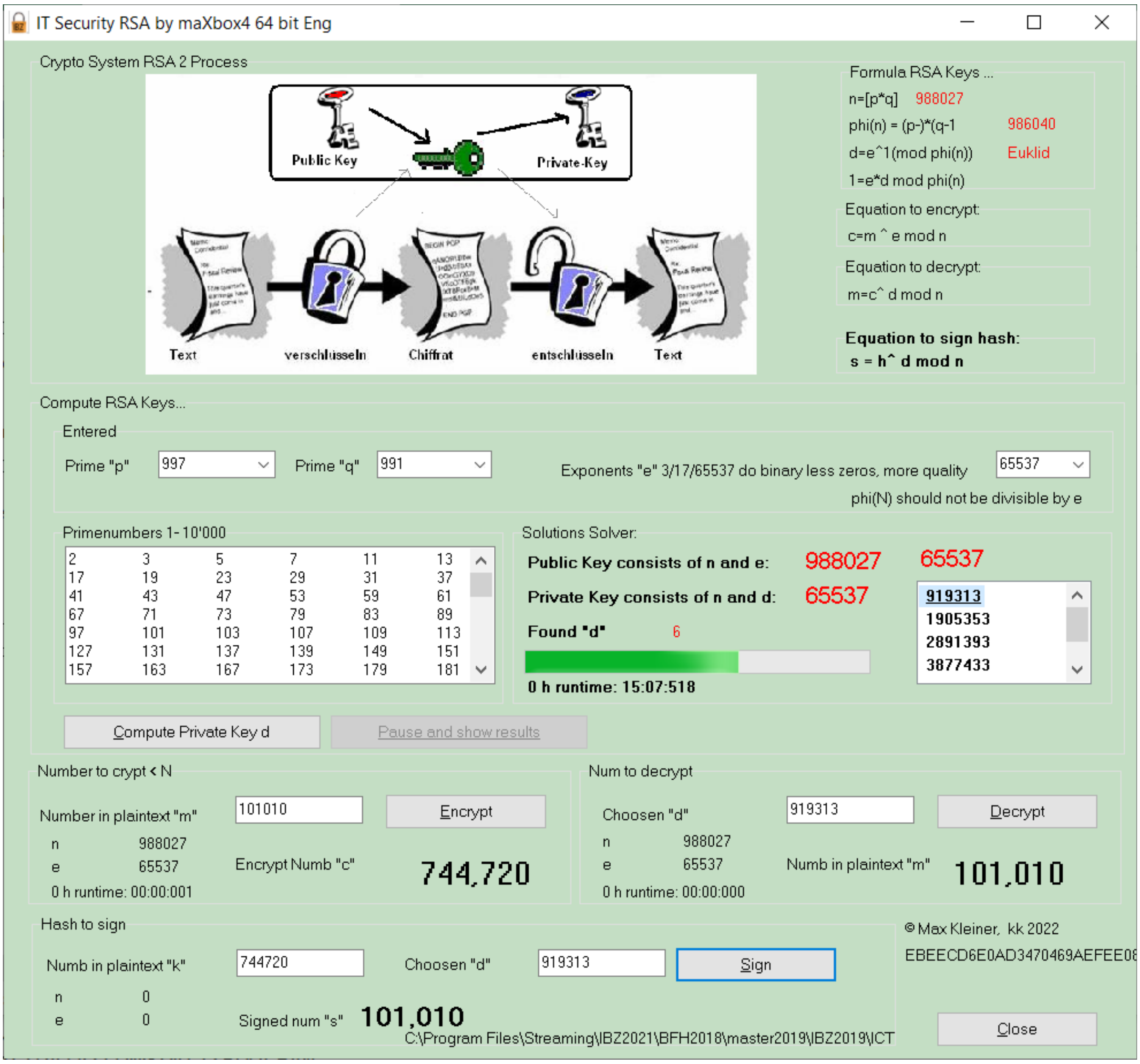
We now compare this **sha1fromfile** function with the associated byte-code:

Source: https://tinyurl.com/yd2pezss

```
Proc [1] Export: SHA1FROMFILE 24 @24
 [0] PUSHTYPE 45(Class) // 1
 [5] PUSHTYPE 46(Class) // 2
 [10] PUSHTYPE 12(U32) // 3
 [15] ASSIGN Base[3], [45]
 [30] PUSHVAR Base[1] // 4
 [36] CALL 2
 [41] POP // 3
 [42] POP // 2
 [43] PUSHTYPE 20(U16) // 3
 [48] ASSIGN Base[3], [32]
 [63] PUSHTYPE 24(String) // 4
 [68] ASSIGN Base[4], Base[-2]
 [79] PUSHTYPE 12(U32) // 5
 [84] ASSIGN Base[5], [46]
 [99] PUSHVAR Base[2] // 6
 [105] CALL 3
 [110] POP // 5
 [111] POP // 4
 [112] POP // 3
 [113] POP // 2
 [114] PUSHEXCEPTION 156 4294967295 4294967295 202
 [131] PUSHTYPE 47(StaticArray[5] of U32) // 3
 [136] PUSHTYPE 10(S64) // 4
 [141] PUSHTYPE 13(S32) // 5
 [146] PUSHTYPE 46(Class) // 6
 [151] ASSIGN Base[6], Base[2]
 [162] PUSHVAR Base[5] // 7
 [168] CALL 6
 [173] POP // 6
 [174] POP // 5
 [175] ASSIGN Base[4], Base[5]
 [186] POP // 4
 [187] PUSHTYPE 10(S64) // 5
 [192] ASSIGN Base[5], [0]
 [207] PUSHTYPE 48(Class) // 6
 [212] ASSIGN Base[6], Base[2]
 [223] PUSHTYPE 45(Class) // 7
 [228] ASSIGN Base[7], Base[1]
 [239] PUSHVAR Base[3] // 8
 [245] CALL 5
 [250] POP // 7
 [251] POP // 6
 [252] POP // 5
 [253] POP // 4
 [254] POP // 3
```

Bytecode is computer object code that an interpreter converts into binary machine code so it can be read by a computer's hardware processor. The interpreter is typically implemented as a virtual machine (VM) like maXbox4VM that translates the bytecode for the target platform.
With bytecode, the source code must be compiled only once. The platform-specific interpreter then converts it to machine code that can be executed by an OS and central processing unit, or CPU.

Second correlations describe the mutual relationship between two variables. They provide the possibility to measure the relation between any kind of data - continuous and continuous, categorical and categorical, and also continuous and categorical at the same time.



Formula RSA Keys ...
n=[p*q] 988027
phi(n) = (p-)*(q-1 986040
d=e^1(mod phi(n)) Euklid
1=e*d mod phi(n)

Equation to encrypt:
c=m ^ e mod n

Equation to decrypt:
m=c^ d mod n

Equation to sign hash:
s = h^ d mod n

Compute RSA Keys...

Entered

Prime "p" 997   Prime "q" 991   Exponents "e" 3/17/65537 do binary less zeros, more quality 65537
phi(N) should not be divisible by e

Primenumbers 1 - 10'000

2	3	5	7	11	13
17	19	23	29	31	37
41	43	47	53	59	61
67	71	73	79	83	89
97	101	103	107	109	113
127	131	137	139	149	151
157	163	167	173	179	181

Solutions Solver:
Public Key consists of n and e: 988027 65537
Private Key consists of n and d: 65537
Found "d" 6
0 h runtime: 15:07:518

919313
1905353
2891393
3877433

Number to crypt < N
Number in plaintext "m" 101010
n 988027
e 65537
0 h runtime: 00:00:001
Encrypt Numb "c" 744,720

Num to decrypt
Choosen "d" 919313
n 988027
e 65537
0 h runtime: 00:00:000
Numb in plaintext "m" 101,010

Hash to sign
Numb in plaintext "k" 744720
n 0
e 0
Choosen "d" 919313
Signed num "s" 101,010
C:\Program Files\Streaming\IBZ2021\BFH2018\master2019\IBZ2019\ICT

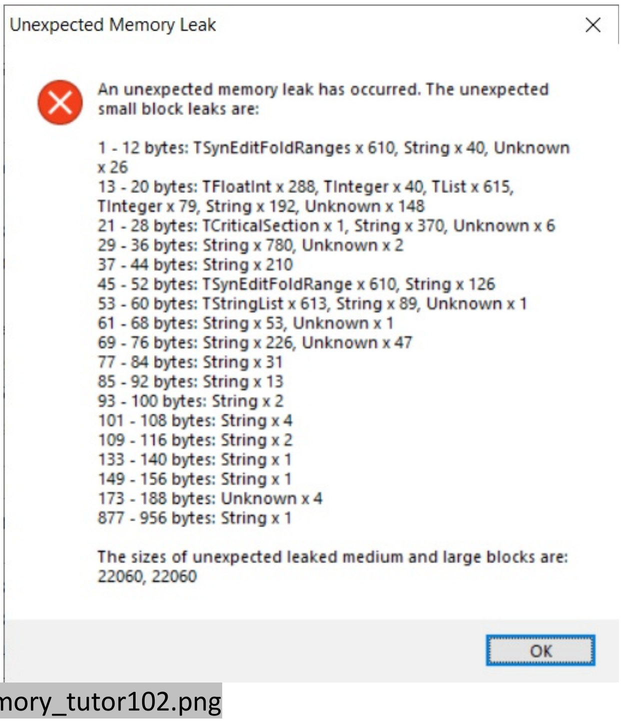
© Max Kleiner, kk 2022
EBEECD6E0AD3470469AEFEE08

Pic: cryptobox2comp_tutor102.png – Compiler

```
00007FF94E7E2680 4883EC78         sub rsp,$78
00007FF94E7E2684 4C8BC9           mov r9,rcx
00007FF94E7E2687 488B0562991100   mov rax,[rel $00119962]
00007FF94E7E268E 4885C0           test rax,rax
00007FF94E7E2691 7410             jz $00007ff94e7e26a3
00007FF94E7E2693 4C8BC2           mov r8,rdx
00007FF94E7E2696 488BD1           mov rdx,rcx
00007FF94E7E2699 33C9             xor ecx,ecx
00007FF94E7E269B FF155F291300     call qword ptr [rel $0013295f]
```

```
00007FF94E7E26A1 EB20             jmp $00007ff94e7e26c3
00007FF94E7E26A3 488BCA           mov rcx,rdx
00007FF94E7E26A6 498BC1           mov rax,r9
00007FF94E7E26A9 FF1551291300     call qword ptr [rel $00132951]
00007FF94E7E26AF 8BC8             mov ecx,eax
00007FF94E7E26B1 E88A1F0000       call $00007ff94e7e4640
00007FF94E7E26B6 90               nop
00007FF94E7E26B7 8BD0             mov edx,eax
00007FF94E7E26B9 4883C9FF         or rcx,-$01
00007FF94E7E26BD E86EAF0400       call $00007ff94e82d630
00007FF94E7E26C2 90               nop
00007FF94E7E26C3 4883C478         add rsp,$78
00007FF94E7E26C7 C3               ret
00007FF94E7E26C8 CC               int 3
00007FF94E7E26C9 CC               int 3
```

The scatter plot which shows us the correlation with respect to other features. This method helps just to figure out the important features which account the most for the classification in our model.



Unexpected Memory Leak

An unexpected memory leak has occurred. The unexpected small block leaks are:

1 - 12 bytes: TSynEditFoldRanges x 610, String x 40, Unknown x 26
13 - 20 bytes: TFloatInt x 288, TInteger x 40, TList x 615, TInteger x 79, String x 192, Unknown x 148
21 - 28 bytes: TCriticalSection x 1, String x 370, Unknown x 6
29 - 36 bytes: String x 780, Unknown x 2
37 - 44 bytes: String x 210
45 - 52 bytes: TSynEditFoldRange x 610, String x 126
53 - 60 bytes: TStringList x 613, String x 89, Unknown x 1
61 - 68 bytes: String x 53, Unknown x 1
69 - 76 bytes: String x 226, Unknown x 47
77 - 84 bytes: String x 31
85 - 92 bytes: String x 13
93 - 100 bytes: String x 2
101 - 108 bytes: String x 4
109 - 116 bytes: String x 2
133 - 140 bytes: String x 1
149 - 156 bytes: String x 1
173 - 188 bytes: Unknown x 4
877 - 956 bytes: String x 1

The sizes of unexpected leaked medium and large blocks are: 22060, 22060

Pic: cryptobox2_ide_memory_tutor102.png

1.3 Scatter Plot

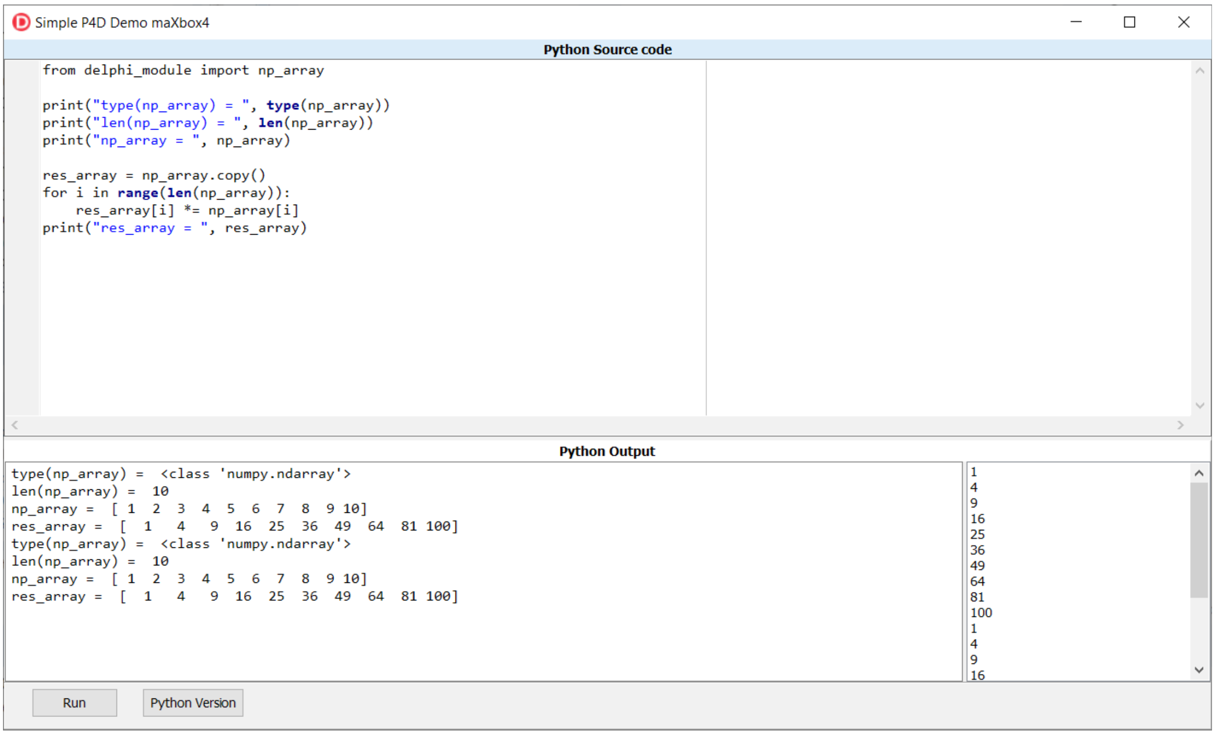
A scatter plot can also be a pair plot using values for two different numeric variables. The position of each dot on the different horizontal and vertical axis indicates values for an individual data point. Scatter plots are mainly used to observe relationships between variables.
A pairplot on the other side plots a pairwise relationships in a dataset. The pairplot function creates a grid of Axes such that each variable in data will by shared in the y-axis across a single row and in the x-axis across a single column. That creates plots as shown before.

Official releases of seaborn can be installed from PyPI:

```
pip install seaborn
```

The basic invocation of `pip` will install seaborn and, if necessary, its mandatory dependencies. It is possible to include optional dependencies that give access to a few advanced features:
pip install seaborn[stats].
Numpy arrays are a good substitute for python lists. They are better than python lists. They provide faster speed and take less memory space. Let’s begin with its definition for those unaware of numpy arrays. They are multi-dimensional matrices or lists of fixed size with similar elements.

Pandas is a popular Python library used to manipulate tabular data. It provides a versatile dataframe object that can read data from many popular formats, such as Excel, SQL, CSV and more.
The Pandas style API provides you with many different tools that makes working with styling tabular data much easier.



```
from delphi_module import np_array

print("type(np_array) = ", type(np_array))
print("len(np_array) = ", len(np_array))
print("np_array = ", np_array)

res_array = np_array.copy()
for i in range(len(np_array)):
    res_array[i] *= np_array[i]
print("res_array = ", res_array)
```

```
type(np_array) =  <class 'numpy.ndarray'>
len(np_array) =  10
np_array =  [ 1  2  3  4  5  6  7  8  9 10]
res_array =  [  1   4   9  16  25  36  49  64  81 100]
type(np_array) =  <class 'numpy.ndarray'>
len(np_array) =  10
np_array =  [ 1  2  3  4  5  6  7  8  9 10]
res_array =  [  1   4   9  16  25  36  49  64  81 100]
```

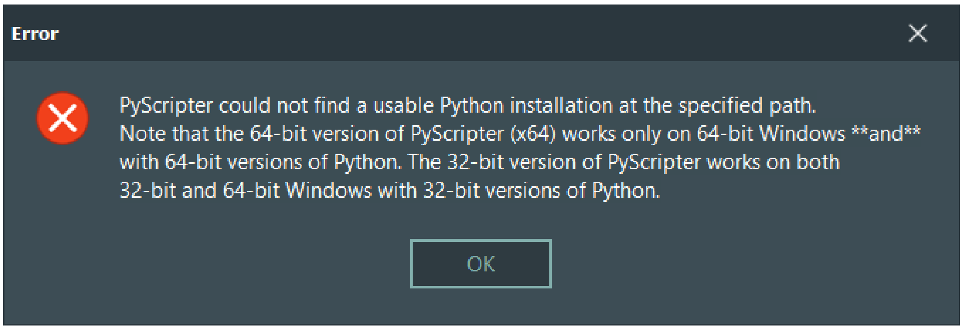
```
1
4
9
16
25
36
49
64
81
100
1
4
9
16
```

1096_2022-11-12_var_python.png

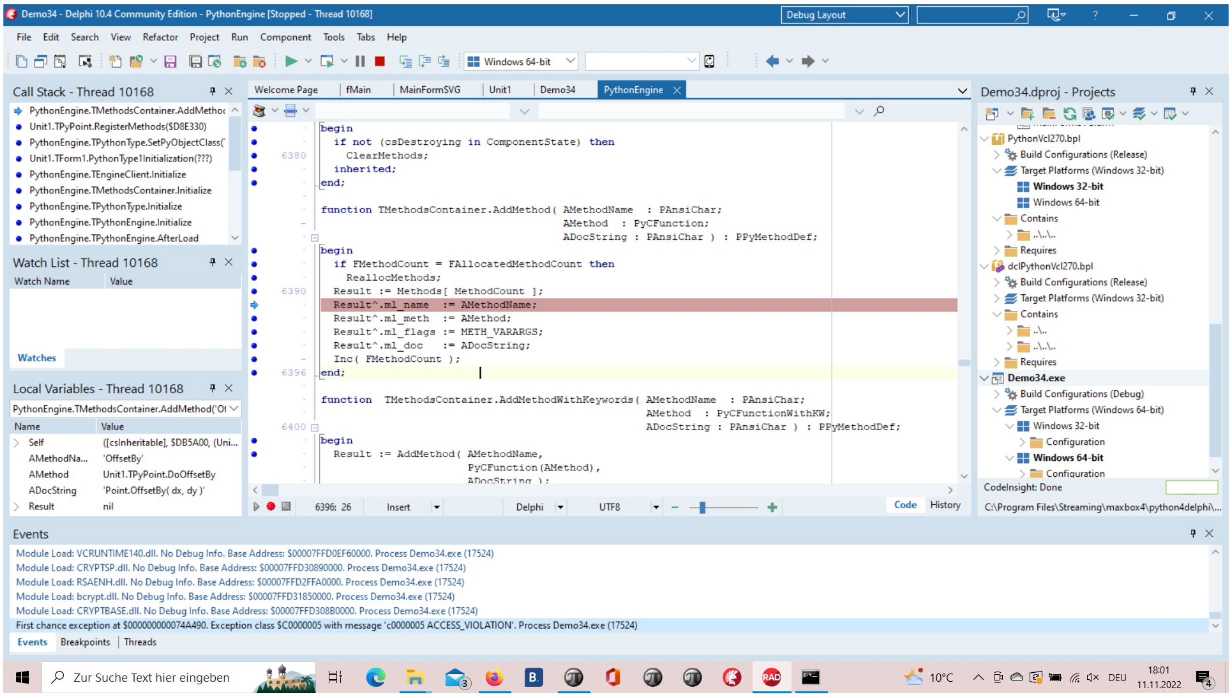
2 Technical Description

maxkleiner (Max Kleiner) (github.com)

A Python program terminates as soon as it encounters an error. In Python, an error can be a syntax error or an exception. In his article, you will see what an exception is and how it differs from a syntax error. After that, you will learn about raising exceptions and making assertions. Then, you’ll finish with a demonstration of the try and except block.
https://realpython.com/python-exceptions/



PyScripter could not find a usable Python installation at the specified path.
Note that the 64-bit version of PyScripter (x64) works only on 64-bit Windows **and** with 64-bit versions of Python. The 32-bit version of PyScripter works on both 32-bit and 64-bit Windows with 32-bit versions of Python.


Demo34 - Delphi 10.4 Community Edition - PythonEngine [Stopped - Thread 10168]
Debug Layout
File Edit Search View Refactor Project Run Component Tools Tabs Help
Windows 64-bit
Welcome Page
fMain
MainFormSVG
Unit1
Demo34
PythonEngine
Demo34.dproj - Projects
Call Stack - Thread 10168
Watch List - Thread 10168
Watch Name
Value
Watches
Local Variables - Thread 10168
6396: 26
Insert
Delphi
UTF8
Code
History
CodeInsight: Done
C:\Program Files\Streaming\maxbox4\python4delphi\...
Events
Events
Breakpoints
Threads
Zur Suche Text hier eingeben
10°C
DEU
18:01
11.11.2022

```
PythonEngine.TMethodsContainer.AddMethoc
Unit1.TPyPoint.RegisterMethods($D8E330)
PythonEngine.TPythonType.SetPyObjectClass(
Unit1.TForm1.PythonType1Initialization(???)
PythonEngine.TEngineClient.Initialize
PythonEngine.TMethodsContainer.Initialize
PythonEngine.TPythonType.Initialize
PythonEngine.TPythonEngine.Initialize
PythonEngine.TPythonEngine.AfterLoad
```

PythonEngine.TMethodsContainer.AddMethod('O1

Name	Value
Self	([csInheritable], $DB5A00, (Uni...
AMethodNa...	'OffsetBy'
AMethod	Unit1.TPyPoint.DoOffsetBy
ADocString	'Point.OffsetBy(dx, dy)'
Result	nil

```
begin
  if not (csDestroying in ComponentState) then
    ClearMethods;
  inherited;
end;

function TMethodsContainer.AddMethod( AMethodName  : PAnsiChar;
                                      AMethod  : PyCFunction;
                                      ADocString : PAnsiChar ) : PPyMethodDef;
begin
  if FMethodCount = FAllocatedMethodCount then
    ReallocMethods;
  Result := Methods[ MethodCount ];
  Result^.ml_name  := AMethodName;
  Result^.ml_meth  := AMethod;
  Result^.ml_flags := METH_VARARGS;
  Result^.ml_doc   := ADocString;
  Inc( FMethodCount );
end;

function  TMethodsContainer.AddMethodWithKeywords( AMethodName  : PAnsiChar;
                                                   AMethod  : PyCFunctionWithKW;
                                                   ADocString : PAnsiChar ) : PPyMethodDef;
begin
  Result := AddMethod( AMethodName,
                       PyCFunction(AMethod),
                       ADocString );
```

```
Module Load: VCRUNTIME140.dll. No Debug Info. Base Address: $00007FFD0EF60000. Process Demo34.exe (17524)
Module Load: CRYPTSP.dll. No Debug Info. Base Address: $00007FFD30890000. Process Demo34.exe (17524)
Module Load: RSAENH.dll. No Debug Info. Base Address: $00007FFD2FFA0000. Process Demo34.exe (17524)
Module Load: bcrypt.dll. No Debug Info. Base Address: $00007FFD31850000. Process Demo34.exe (17524)
Module Load: CRYPTBASE.dll. No Debug Info. Base Address: $00007FFD308B0000. Process Demo34.exe (17524)
First chance exception at $000000000074A490. Exception class $C0000005 with message 'c0000005 ACCESS_VIOLATION'. Process Demo34.exe (17524)
```

This Exception was prior to change between 32- and 64 bit.

1096_2022-11-11_exception.png

PySripter 4.0.0 is now available at Sourceforge. PyScripter is fully programmed in Delphi. This is a major new release with an updated User Interface and many significant enhancements under the hood, that will increase the stability and improve the user experience.

Scalable Vector **Graphics** (**SVG**) is an XML-based vector image format for defining two-dimensional **graphics**, having support for interactivity and animation. The **SVG** specification is an open standard developed by the World Wide Web Consortium since 1999.

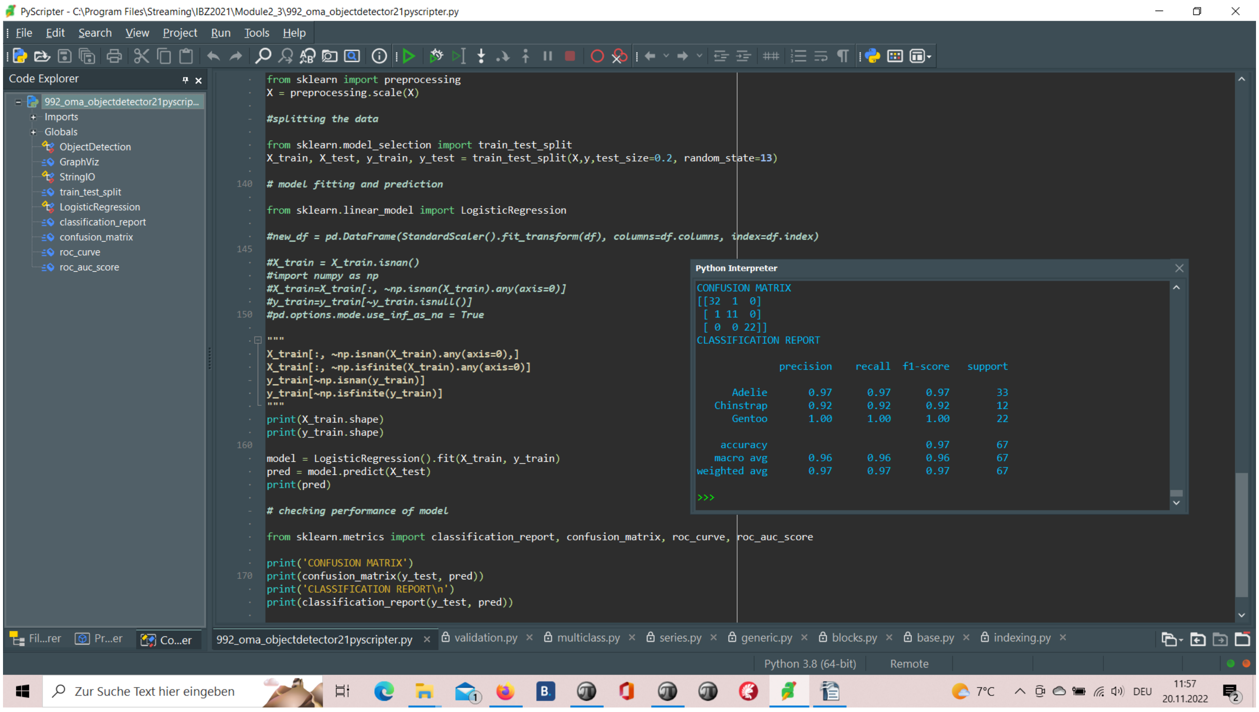
https://en.wikipedia.org/wiki/SVG

Conclusion: For the moment you can use four engines to render SVG (Delphi Image32, Delphi TSVG, SKIA4Delphi and Direct2D wrapper) and four components (packages) to simplify use of SVG images (resize, fixedcolor, grayscale and so on) and with Python4Delphi is a fifth engine available:

```
procedure TForm1.FormCreate(Sender: TObject);
        begin
          var Py:= PyDelphiWrapper.Wrap(SVGIconImage, soReference);
          PythonModule.SetVar('svg_image', Py);
          GetPythonEngine.Py_DECREF(Py);
        end;
```

Tested on

- **Delphi 10.4 Community Edition Update 2**
- **Lazarus V 2.2.4 for Windows 64 bit**
- **maXbox4 Version 4.7.6.20 x32**
- **PyScripter 4.1.1.0 x64**
- **SVGImage32Package270.bpl V 3.9.4**



```
from sklearn import preprocessing
X = preprocessing.scale(X)

#splitting the data

from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X,y,test_size=0.2, random_state=13)

# model fitting and prediction

from sklearn.linear_model import LogisticRegression

#new_df = pd.DataFrame(StandardScaler().fit_transform(df), columns=df.columns, index=df.index)

#X_train = X_train.isnan()
#import numpy as np
#X_train=X_train[:, ~np.isnan(X_train).any(axis=0)]
#y_train=y_train[~y_train.isnull()]
#pd.options.mode.use_inf_as_na = True

"""
X_train[:, ~np.isnan(X_train).any(axis=0),]
X_train[:, ~np.isfinite(X_train).any(axis=0)]
y_train[~np.isnan(y_train)]
y_train[~np.isfinite(y_train)]
"""
print(X_train.shape)
print(y_train.shape)

model = LogisticRegression().fit(X_train, y_train)
pred = model.predict(X_test)
print(pred)

# checking performance of model

from sklearn.metrics import classification_report, confusion_matrix, roc_curve, roc_auc_score

print('CONFUSION MATRIX')
print(confusion_matrix(y_test, pred))
print('CLASSIFICATION REPORT\n')
print(classification_report(y_test, pred))
```

```
CONFUSION MATRIX
[[32  1  0]
 [ 1 11  0]
 [ 0  0 22]]
CLASSIFICATION REPORT

              precision    recall  f1-score   support

      Adelie       0.97      0.97      0.97        33
   Chinstrap       0.92      0.92      0.92        12
      Gentoo       1.00      1.00      1.00        22

    accuracy                           0.97        67
   macro avg       0.96      0.96      0.96        67
weighted avg       0.97      0.97      0.97        67

>>>
```

Sick of using IDLE? Want to code in a fancy new IDE? These steps will help you in downloading Python 2.7.1 or Python 3.8 and PyScripter so you can start learning and have fun with Python.

1096_2022-11-12_develop_overview2.png

https://www.instructables.com/Python-With-PyScripter/

3 Develop Overview

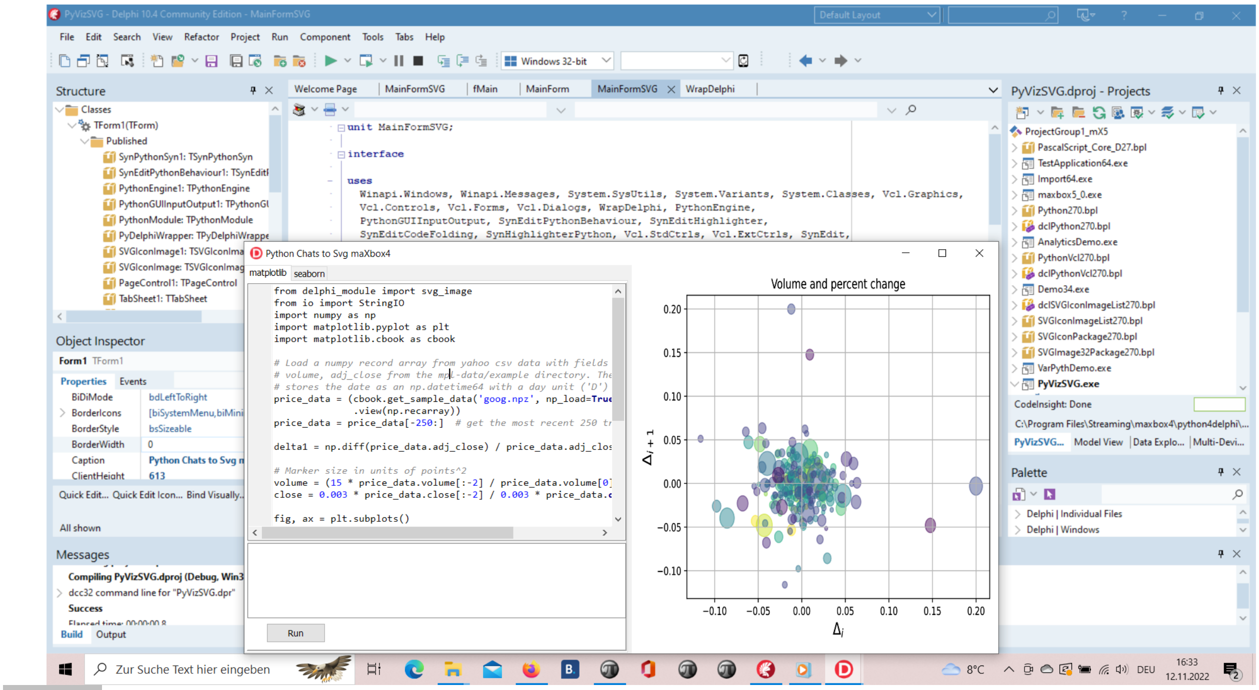
We value the quality of the material each student is learning. Our Instructor led classes help provide hands-on learning, one-on-one mentoring with experienced developers and peer-to-peer learning. To allow the most flexibility for students, we have Day and Night programs to choose from. *No prior coding experience required.

```
***********************************************************
Release Notes maXbox 4.7.6.20 Dez 2022 mX476
****************************************************************
Add 75 Units + 21 Tutorials
```

1507 unit HttpConnection.pas

```
1508 unit uPSI_HttpConnectionWinInet.pas
1509 unit UHexUtils.pas
1510 unit UExeFileType.pas
1511 unit uPSI_UConsoleApp.pas
1512 unit uPSI_CompilersURunner.pas
1513 unit uPSI_HttpConnection.pas
1514 unit uPSI_DataSetUtils.pas
1515 unit uPSI_HTTPSender.pas

Total of Function Calls: 36205
SHA1: 4.7.6.20 BF042A1DC1C479C706100BB83F8DEE351554F74B
CRC32: 4A7231F8 32.4 MB (34,057,496 bytes)
Compilation Timestamp 2022-12-15 14:45:59 UTC Signing time 15 Dec 2022
15:50:51
Entry Point 24930856 - Contained Sections 10
ZIP maxbox4.zip SHA1: 8DDCC4AF2E821F998A8A96612F2D4629FA88D38A
```



```
unit MainFormSVG;

interface

uses
  Winapi.Windows, Winapi.Messages, System.SysUtils, System.Variants, System.Classes, Vcl.Graphics,
  Vcl.Controls, Vcl.Forms, Vcl.Dialogs, WrapDelphi, PythonEngine,
  PythonGUIInputOutput, SynEditPythonBehaviour, SynEditHighlighter,
  SynEditCodeFolding, SynHighlighterPython, Vcl.StdCtrls, Vcl.ExtCtrls, SynEdit,
```

```
from delphi_module import svg_image
from io import StringIO
import numpy as np
import matplotlib.pyplot as plt
import matplotlib.cbook as cbook

# Load a numpy record array from yahoo csv data with fields
# volume, adj_close from the mpl-data/example directory. The
# stores the date as an np.datetime64 with a day unit ('D')
price_data = (cbook.get_sample_data('goog.npz', np_load=True
              .view(np.recarray))
price_data = price_data[-250:]  # get the most recent 250 tr

delta1 = np.diff(price_data.adj_close) / price_data.adj_clos

# Marker size in units of points^2
volume = (15 * price_data.volume[:-2] / price_data.volume[0]
close = 0.003 * price_data.close[:-2] / 0.003 * price_data.c

fig, ax = plt.subplots()
```

```
Compiling PyVizSVG.dproj (Debug, Win3
dcc32 command line for "PyVizSVG.dpr"
Success
```

1096_2022-11-12_develop_overview.png

```
 procedure pyBank_VCL4Python4Delphi;
var eg: TPythonEngine; sw: TStopWatch;
begin
 eg:= TPythonEngine.Create(Nil);
  try
    eg.pythonhome:= PYHOME;
    eg.loadDLL;
    println('test import
'+GetPythonEngine.EvalStr('__import__("decimal").Decimal(0.1)'));
    writeln('')
    //println(eg.EvalStr('__import__("faker").Faker()'));
    sw:= TStopWatch.Create();
    sw.Start;
    eg.execStr('import importlib.machinery, importlib.util');
    eg.execStr('from decimal import Decimal, getcontext');
    importlib.machinery.ExtensionFileLoader("DelphiVCL",'+VCLHOME+')')

    eg.execStr(ANALYTICSSVG);

//println(eg.evalStr(''#39'MSE:'#39',mean_squared_error(test_bayesian_pred,
y_test_confirmed)'));

    sw.Stop;
    //sw.ElapsedMilliseconds;
    writeln('Stop Analytics Tester1: '+sw.getValueStr)
  except
    eg.raiseError;
    writeln(ExceptionToString(ExceptionType, ExceptionParam));
  finally
    eg.Free;
    sw.Free;
    sw:= Nil;
  end;
end;
```