Placa de dezvoltare UNO R3 compatibil Arduino

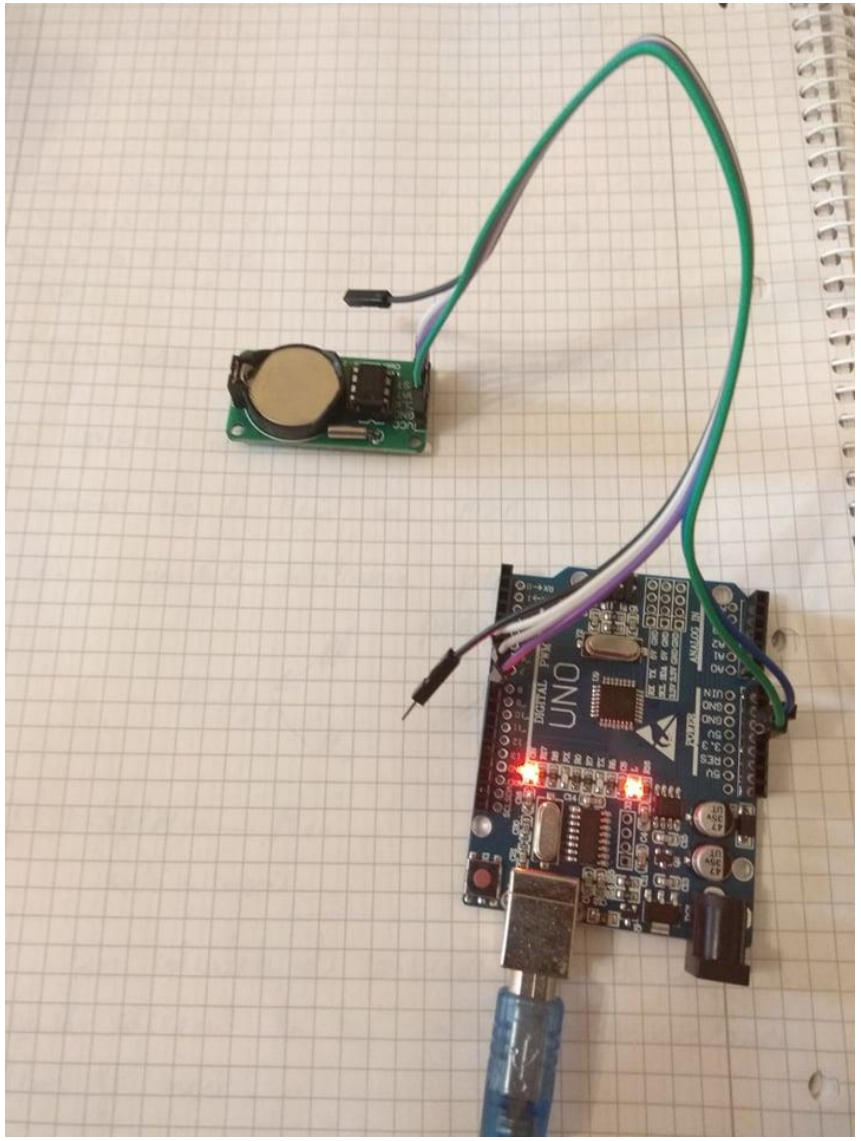
Caracteristici tehnice:

- Microcontroller: ATmega328p
- USB Chip: CH340G
- Tensiune alimentare USB: 5V
- Tensiune alimentare conector DC: 8-12V
- Pini digitali I/O: 14 (6 suporta iesire PWM)
- Pini analogici: 6
- Curent maxim pe pin I/O: 40 mA
- Memorie Flash: 32 KB (ATmega328) of which 0.5 KB used by bootloader
- SRAM: 2 KB (ATmega328)
- EEPROM: 1 KB (ATmega328)
- Frecventa: 16 MHz

MODUL RTC DS1302

Caracteristici tehnice:

- Dimensiune: 44 x 23 x 1.6 mm
- Diametrul găurilor: 3.1 mm
- Tensiune: 3.3V / 5V
- Temperatură: 0°C - 70°C
- Utilizeaza mai putin de 300nA la 2.0V
- Greutate: 10g



```
#include "ArduinoSTL.h"
#include <virtuabotixRTC.h>

int ByteReceived;
std::vector<std::vector<int>> idStore;
virtuabotixRTC myRTC(6, 7, 8);
char *modulsName[] = { "ABS", "BMS", "DCU", "ECU", "ESP" };

void setup() {
  std::vector<int> v;
  idStore.push_back(v);
  idStore.push_back(v);
  idStore.push_back(v);
  idStore.push_back(v);
  idStore.push_back(v);
  Serial.begin(9600);
}

void loop() {
  myRTC.updateTime();
  if (Serial.available() > 0) {
    ByteReceived = Serial.read();
    if (ByteReceived == '1') {
      int mNr = random(0, 4);
```

```
void loop() {
  myRTC.updateTime();
  if (Serial.available() > 0) {
    ByteReceived = Serial.read();
    if (ByteReceived == '1') {
      int mNr = random(0, 4);
      int mId = random(100, 999);

      while (idStore[mNr].end() == std::find(idStore[mNr].begin(), idStore[mNr].end(), mId)) {
        mId = random(100, 999);
      }
      idStore[mNr].push_back(mId);
      int uqa = random(10, 50);
      int uqt = random(0, 2);
      int uqaid = random(1000, 1200);
      int uqb = random(4, 25); int uqbid = random(300, 399);
      int uqc = random(3, 13); int uqcid = random(100, 999);
      int uqd = random(1, 5);  int uqdid = random(1000, 5000);
      int uqe = random(5, 20); int uqeid = random(100, 999);

      Serial.print((String)modulsName[mNr] + (String)mId + " ");
      Serial.print((String)uqt + " ");
      Serial.print("RES" + (String)uqaid + " " + (String)uqa + " ");
      Serial.print("TRANS" + (String)uqbid + " " + (String)uqb + " ");
      Serial.print("CAP" + (String)uqcid + " " + (String)uqc + " ");
      Serial.print("IND" + (String)uqdid + " " + (String)uqd + " ");
      Serial.print("DIO" + (String)uqeid + " " + (String)uqe + " ");
      Serial.print(myRTC.day); Serial.print("/");  Serial.print(myRTC.month);
      Serial.print("/");Serial.print(myRTC.year);Serial.print("T");
      Serial.print(myRTC.hours); Serial.print(":");
      Serial.print(myRTC.minutes);Serial.print(":");Serial.print(myRTC.seconds);
      Serial.println();
    }
```

```
1
2   using System;
3   using System.IO.Ports;
4   using System.Collections.Generic;
5   using System.Threading;
6   using System.Text.Json;
7
8   namespace project_1
9   {
        0 references
10      class Program
11      {
            7 references
12          static SerialPort _serialPort;
            0 references
13          public static void Main()
14          {
15              _serialPort = new SerialPort();
16              _serialPort.PortName = "COM6"; // Set your board COM
17              _serialPort.BaudRate = 9600;
18              _serialPort.Open();
19              var models = new List<ModulModel>();
20              while (_serialPort.IsOpen && models.Count < 101)
21              {
22                  _serialPort.WriteLine("1");
23                  string a = _serialPort.ReadExisting();
24                  var splited = a.Split(" ");
25                  if (splited.Length > 11)
26                  {
27                      var modul = new ModulModel();
28                      modul.Id = splited[0];
29                      Console.WriteLine(splited[1]);
30                      modul.Valid = splited[1] == "1" ? true : false;
31                      modul.Resistors = new List<ElementModel>() {
32                          new ElementModel
33                          { ElementId = splited[2],
34                          ElementQuantity = splited[3] } };
35
36                      modul.Transistors = new List<ElementModel>() {
37                          new ElementModel
38                          { ElementId = splited[4],
39                          ElementQuantity = splited[5] } };
40
41                      modul.Capacitors = new List<ElementModel>() {
42                          new ElementModel
43                          { ElementId = splited[6],
44                          ElementQuantity = splited[7] } };
```

```
27                      var modul = new ModulModel();
28                      modul.Id = splited[0];
29                      Console.WriteLine(splited[1]);
30                      modul.Valid = splited[1] == "1" ? true : false;
31                      modul.Resistors = new List<ElementModel>() {
32                          new ElementModel
33                          { ElementId = splited[2],
34                          ElementQuantity = splited[3] } };
35
36                      modul.Transistors = new List<ElementModel>() {
37                          new ElementModel
38                          { ElementId = splited[4],
39                          ElementQuantity = splited[5] } };
40
41                      modul.Capacitors = new List<ElementModel>() {
42                          new ElementModel
43                          { ElementId = splited[6],
44                          ElementQuantity = splited[7] } };
45
46                      modul.Inductions = new List<ElementModel>() {
47                          new ElementModel
48                          { ElementId = splited[8],
49                          ElementQuantity = splited[9] } };
50
51                      modul.Diodes = new List<ElementModel>() {
52                          new ElementModel
53                          { ElementId = splited[10],
54                          ElementQuantity = splited[11] } };
55
56                      modul.TestedData =  DateTime.ParseExact(splited[12], "dd/MM/YYYYTHH:mm:ss",null);
57
58                      models.Add(modul);
59                      Console.WriteLine(models.Count);
60                  }
61                  Thread.Sleep(15000);
62
63              }
64              string jsonStrings = JsonSerializer.Serialize(models);
65
66                  Console.WriteLine(jsonStrings);
67          }
68      }
69  }
70
```

Fluxul de lucru

Arduino

- Verifica daca a primit “1”
- Se selecteaza aleator un ModulName si ModulId
- Se verifica sa nu existe un modul cu acelas Id
- Se genereaza Id-uri si cantitate pentru fiecare componente
- Prin Serial.print se trimite informatiile delimitate prin spatiu
- Din Modulul RTC se ia Data si la fel se face Serial.print

Program de citire a datelor din port

- Se seteaza portul la care e conectat Arduino si BaudRate
- Se verifica daca portul e deschis si se trimite “1”
- Citeste datele primite din SerialPort
- Disperseaza prin spatiu si parcurge lista obtinuta
- Creeaza `ModulModel` cu datele obtinute si adauga in lista

Mediu de dezvoltare: Excel 2013
Primul task de realizat: colectarea datelor stocate intr-un fisier text dupa formatarea in json a datelor de pe serial port.


JSon2.txt - Notepad

File Edit Format View Help

[{"Id":"ECU247","Valid":true,"Resistors":[{"ElementId":"RES1007","ElementQuantity":"23"}],"Transistors":[{"ElementId":"TRANS377","ElementQuantity":"15"}],"Capacitors":
[{"ElementId":"CAP396","ElementQuantity":"3"}],"Inductions":[{"ElementId":"IND4935","ElementQuantity":"2"}],"Diodes":[{"ElementId":"DIO437","ElementQuantity":"18"}],"TestedData":"2021-07-
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[{"ElementId":"IND3500","ElementQuantity":"3"}],"Diodes":[{"ElementId":"DIO871","ElementQuantity":"10"}],"TestedData":"2021-07-15T09:00:43.113619+03:00"},
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[{"ElementId":"CAP361","ElementQuantity":"8"}],"Inductions":[{"ElementId":"IND3343","ElementQuantity":"3"}],"Diodes":[{"ElementId":"DIO672","ElementQuantity":"19"}],"TestedData":"2021-07-
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[{"ElementId":"TRANS370","ElementQuantity":"4"}],"Capacitors":[{"ElementId":"CAP599","ElementQuantity":"5"}],"Inductions":[{"ElementId":"IND4724","ElementQuantity":"2"}],"Diodes":
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[{"ElementId":"RES1138","ElementQuantity":"19"}],"Transistors":[{"ElementId":"TRANS304","ElementQuantity":"6"}],"Capacitors":[{"ElementId":"CAP706","ElementQuantity":"10"}],"Inductions":
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Ln 1, Col 1 100% Windows (CRLF) UTF-8

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	ID	Validation	Resistors Element	Resistors Element Quan	Transistors Element	Transistors Element Quant	Capacitors Element	Capacitors Element Quan	Inductions Element	InductionsElement Quant	Diodes Element I	Diodes Element Quant	Tested Data
2	DCU713	TRUE	RES1075	47	TRANS370	22	CAP707	9	IND2086	3	DIO741	5	2021-07-15T08:22:33.9080655+03:00
3	DCU669	FALSE	RES1150	44	TRANS384	4	CAP778	4	IND2355	1	DIO692	18	2021-07-15T08:24:53.0113233+03:00
4	ABS639	TRUE	RES1105	36	TRANS332	4	CAP940	6	IND3883	1	DIO837	12	2021-07-15T08:26:55.0170091+03:00
5	ECU202	TRUE	RES1177	35	TRANS336	16	CAP290	8	IND1231	2	DIO691	5	2021-07-15T08:28:57.0341031+03:00
6	ECU206	TRUE	RES1122	34	TRANS381	12	CAP407	3	IND4934	4	DIO321	12	2021-07-15T08:30:59.0434976+03:00
7	ECU676	TRUE	RES1087	47	TRANS329	8	CAP559	7	IND2630	3	DIO894	19	2021-07-15T08:33:01.0515239+03:00
8	ECU363	TRUE	RES1113	13	TRANS371	22	CAP321	7	IND3429	4	DIO796	10	2021-07-15T08:35:03.0611527+03:00
9	ECU725	TRUE	RES1079	17	TRANS385	12	CAP957	3	IND2501	4	DIO399	18	2021-07-15T08:37:05.0726527+03:00
10	ABS790	FALSE	RES1030	22	TRANS369	19	CAP437	11	IND4132	1	DIO890	13	2021-07-15T08:39:07.0851123+03:00
11	BMS432	TRUE	RES1045	26	TRANS350	19	CAP397	11	IND1105	4	DIO459	14	2021-07-15T08:41:09.0982669+03:00
12	ECU182	TRUE	RES1158	13	TRANS303	6	CAP869	8	IND3744	1	DIO817	17	2021-07-15T08:43:11.108964+03:00
13	ECU834	TRUE	RES1004	28	TRANS302	4	CAP813	8	IND2292	3	DIO124	10	2021-07-15T08:45:13.1215235+03:00
14	BMS618	FALSE	RES1073	18	TRANS322	15	CAP415	3	IND4621	4	DIO969	14	2021-07-15T08:47:15.1334514+03:00
15	ECU870	TRUE	RES1108	18	TRANS324	16	CAP544	6	IND4924	1	DIO201	5	2021-07-15T08:49:17.1427419+03:00
16	ABS802	TRUE	RES1095	48	TRANS306	4	CAP694	9	IND3537	1	DIO175	11	2021-07-15T08:51:19.1568114+03:00
17	BMS546	TRUE	RES1181	46	TRANS394	13	CAP342	11	IND3687	4	DIO721	13	2021-07-15T08:53:21.1657246+03:00
18	BMS298	FALSE	RES1051	26	TRANS318	12	CAP612	3	IND3429	3	DIO460	7	2021-07-15T08:55:23.1769843+03:00
19	BMS737	FALSE	RES1145	48	TRANS378	24	CAP271	10	IND2641	4	DIO709	19	2021-07-15T08:57:25.1923725+03:00
20	BMS215	TRUE	RES1064	24	TRANS384	16	CAP263	4	IND3053	1	DIO268	9	2021-07-15T08:59:27.2075549+03:00
21	ABS279	FALSE	RES1176	44	TRANS336	11	CAP307	11	IND4266	3	DIO116	12	2021-07-15T09:01:29.2208071+03:00
22	DCU468	TRUE	RES1027	37	TRANS307	19	CAP668	11	IND1761	2	DIO900	6	2021-07-15T09:03:31.2320706+03:00
23	ABS713	TRUE	RES1054	44	TRANS386	7	CAP989	7	IND4113	3	DIO725	16	2021-07-15T09:05:33.2388147+03:00
24	ABS983	FALSE	RES1192	15	TRANS391	9	CAP228	12	IND2480	4	DIO259	9	2021-07-15T09:07:35.2545122+03:00
25	ABS412	TRUE	RES1183	41	TRANS333	14	CAP503	10	IND1989	1	DIO531	18	2021-07-15T09:09:37.2671807+03:00
26	DCU720	TRUE	RES1042	10	TRANS345	18	CAP504	6	IND1198	4	DIO741	18	2021-07-15T09:11:39.2812638+03:00
27	ECU475	TRUE	RES1029	19	TRANS328	21	CAP150	3	IND3711	2	DIO937	8	2021-07-15T09:13:41.2969524+03:00
28	DCU254	FALSE	RES1122	13	TRANS325	24	CAP997	8	IND1612	1	DIO164	15	2021-07-15T09:15:43.3117992+03:00
29	ABS888	TRUE	RES1119	28	TRANS333	9	CAP448	4	IND2467	3	DIO741	17	2021-07-15T09:17:45.3233458+03:00
30	BMS792	TRUE	RES1027	27	TRANS321	19	CAP970	3	IND4001	1	DIO722	19	2021-07-15T09:19:47.3358135+03:00
31	ABS474	FALSE	RES1108	43	TRANS306	22	CAP133	10	IND3879	2	DIO574	14	2021-07-15T09:21:49.3485217+03:00
32	ECU846	TRUE	RES1137	29	TRANS302	5	CAP553	11	IND3815	2	DIO465	17	2021-07-15T09:23:51.3662952+03:00
33	BMS257	FALSE	RES1072	45	TRANS348	22	CAP631	11	IND2324	4	DIO894	10	2021-07-15T09:25:53.3849345+03:00
34	BMS334	TRUE	RES1008	44	TRANS381	22	CAP228	8	IND1211	4	DIO631	5	2021-07-15T09:27:55.3896426+03:00
35	DCU379	FALSE	RES1101	12	TRANS364	5	CAP722	3	IND3605	3	DIO468	18	2021-07-15T09:29:57.3971685+03:00
36	ABS559	FALSE	RES1016	43	TRANS319	16	CAP522	4	IND1203	3	DIO594	17	2021-07-15T09:31:59.4097304+03:00
37	BMS857	TRUE	RES1098	21	TRANS352	7	CAP877	9	IND3499	2	DIO479	15	2021-07-15T09:34:01.4224973+03:00
38	ECU674	TRUE	RES1161	21	TRANS376	23	CAP417	11	IND1524	1	DIO849	18	2021-07-15T09:36:03.4310762+03:00
39	ECU479	TRUE	RES1006	49	TRANS311	4	CAP369	11	IND1209	3	DIO841	7	2021-07-15T09:38:05.4447354+03:00
40	DCU516	TRUE	RES1111	40	TRANS310	10	CAP559	11	IND1662	4	DIO391	18	2021-07-15T09:40:07.4501977+03:00
41	ECU891	TRUE	RES1029	22	TRANS333	19	CAP731	4	IND4439	2	DIO113	15	2021-07-15T09:42:09.4618485+03:00
42	BMS861	TRUE	RES1084	15	TRANS361	16	CAP368	12	IND4899	2	DIO641	12	2021-07-15T09:44:11.4710484+03:00
43	DCU238	FALSE	RES1021	32	TRANS328	17	CAP264	10	IND1101	2	DIO178	10	2021-07-15T09:46:13.4802904+03:00
44	DCU426	TRUE	RES1058	38	TRANS327	18	CAP795	12	IND2992	2	DIO563	11	2021-07-15T09:48:15.4964367+03:00
45	ABS185	TRUE	RES1037	23	TRANS314	8	CAP279	6	IND4905	4	DIO135	13	2021-07-15T09:50:17.5105834+03:00
46	BMS141	TRUE	RES1092	34	TRANS340	10	CAP425	12	IND1695	4	DIO852	18	2021-07-15T09:52:19.536612+03:00

Urmatorul task: realizarea bazei de date pentru conexiunea acesteia cu interfata si partea de RAPP/STAPP.

	ID	Validation	Resistors Element ID	Resistors Element Quantity	Transistors Element ID	Transistors Element Quantity	Capacitors Element ID	Capacitors Element Quantity	Inductions Element ID	InductionsElement Quantity	Diodes Element ID	Diodes Element Quantity	Tested Data
145	ECU855	TRUE	RES1114	49	TRANS302	16	CAP822	8	IND2820	2	DIO183	10	2021-07-15T09:59:41.4495315+03:00
146	BMS311	TRUE	RES1033	18	TRANS398	7	CAP794	3	IND3806	1	DIO527	8	2021-07-15T10:01:43.4618656+03:00
147	DCU535	FALSE	RES1183	37	TRANS393	11	CAP530	4	IND4019	1	DIO354	7	2021-07-15T10:03:45.4766137+03:00
148	ABS758	FALSE	RES1181	10	TRANS388	4	CAP403	4	IND4453	3	DIO286	19	2021-07-15T10:05:47.4871123+03:00
149	BMS724	TRUE	RES1114	11	TRANS328	12	CAP371	10	IND2701	3	DIO454	18	2021-07-15T10:07:49.4969421+03:00
150	ECU818	FALSE	RES1085	46	TRANS318	24	CAP498	9	IND1800	1	DIO700	10	2021-07-15T10:09:51.5100017+03:00
151	BMS438	TRUE	RES1141	45	TRANS376	21	CAP913	11	IND3037	4	DIO213	10	2021-07-15T10:13:55.5304173+03:00
152	BMS151	FALSE	RES1083	17	TRANS366	23	CAP951	8	IND3776	1	DIO210	11	2021-07-15T10:15:57.5406098+03:00
153	DCU144	FALSE	RES1088	31	TRANS374	10	CAP332	12	IND3627	2	DIO434	5	2021-07-15T10:17:59.5525157+03:00
154	ECU124	FALSE	RES1168	49	TRANS368	13	CAP800	11	IND4582	4	DIO331	11	2021-07-15T10:20:01.5661545+03:00
155	ECU387	TRUE	RES1109	36	TRANS375	11	CAP432	3	IND4778	2	DIO215	14	2021-07-15T10:22:03.5762369+03:00
156	BMS821	TRUE	RES1018	10	TRANS323	15	CAP888	4	IND1764	1	DIO677	6	2021-07-15T10:24:05.5874797+03:00
157	BMS249	FALSE	RES1090	25	TRANS322	9	CAP958	11	IND4079	1	DIO610	10	2021-07-15T10:26:07.5995589+03:00
158	ECU490	TRUE	RES1033	17	TRANS396	13	CAP207	10	IND1560	4	DIO188	5	2021-07-15T10:28:09.6103788+03:00
159	ABS257	FALSE	RES1066	21	TRANS354	7	CAP437	7	IND2939	4	DIO471	10	2021-07-15T10:30:11.6214387+03:00
160	DCU891	TRUE	RES1071	41	TRANS360	11	CAP599	6	IND1891	3	DIO770	16	2021-07-15T10:32:13.6269413+03:00
161	ABS105	TRUE	RES1097	18	TRANS332	8	CAP514	9	IND2154	1	DIO988	13	2021-07-15T10:34:15.6411725+03:00
162	ECU752	TRUE	RES1168	32	TRANS376	7	CAP837	11	IND1974	4	DIO863	17	2021-07-15T10:36:17.6539562+03:00
163	ECU307	FALSE	RES1130	45	TRANS339	13	CAP998	7	IND1124	2	DIO947	13	2021-07-15T10:38:19.6594609+03:00
164	DCU880	TRUE	RES1095	49	TRANS372	11	CAP219	3	IND2613	3	DIO564	10	2021-07-15T10:40:20.66492+03:00
165	ECU823	FALSE	RES1007	43	TRANS362	19	CAP435	5	IND2862	4	DIO697	19	2021-07-15T10:42:21.6732129+03:00
166	DCU394	TRUE	RES1187	34	TRANS384	12	CAP964	9	IND1037	1	DIO851	14	2021-07-15T10:44:22.6809028+03:00
167	ECU622	TRUE	RES1136	23	TRANS375	22	CAP235	10	IND4628	1	DIO708	8	2021-07-15T10:46:23.6885093+03:00
168	ABS561	FALSE	RES1080	45	TRANS321	23	CAP365	4	IND4578	4	DIO765	11	2021-07-15T10:48:24.6929038+03:00
169	DCU710	TRUE	RES1182	31	TRANS333	12	CAP900	9	IND1817	1	DIO692	18	2021-07-15T10:50:25.7017085+03:00
170	ECU607	TRUE	RES1081	31	TRANS370	20	CAP730	11	IND2461	1	DIO770	11	2021-07-15T10:52:26.7091559+03:00
171	DCU655	TRUE	RES1137	40	TRANS356	10	CAP105	4	IND4396	1	DIO676	16	2021-07-15T10:54:27.7183238+03:00
172	ECU894	FALSE	RES1072	43	TRANS320	12	CAP680	8	IND1461	3	DIO377	10	2021-07-15T11:24:43.8283959+03:00
173	ABS921	FALSE	RES1112	41	TRANS360	13	CAP857	6	IND2928	2	DIO311	11	2021-07-15T11:26:44.8358426+03:00
174	BMS669	TRUE	RES1046	13	TRANS330	13	CAP842	9	IND4304	1	DIO845	18	2021-07-15T11:28:45.838642+03:00
175	BMS369	FALSE	RES1191	27	TRANS383	7	CAP132	10	IND1132	2	DIO284	11	2021-07-15T11:30:46.8429644+03:00
176	DCU107	FALSE	RES1119	20	TRANS337	11	CAP980	4	IND1368	2	DIO306	16	2021-07-15T11:32:47.8616559+03:00
177	DCU499	FALSE	RES1092	48	TRANS393	15	CAP622	9	IND4450	3	DIO387	6	2021-07-15T11:34:48.8649762+03:00
178	BMS393	TRUE	RES1166	25	TRANS355	8	CAP566	7	IND2661	2	DIO926	15	2021-07-15T11:36:49.8685573+03:00
179	DCU401	TRUE	RES1159	26	TRANS314	24	CAP409	6	IND2814	3	DIO964	11	2021-07-15T11:38:50.976839+03:00
180	ECU306	FALSE	RES1064	48	TRANS348	7	CAP787	9	IND3680	2	DIO709	13	2021-07-15T11:40:51.8796478+03:00
181	ABS244	TRUE	RES1171	43	TRANS368	14	CAP311	11	IND4503	1	DIO756	8	2021-07-15T11:42:52.8867095+03:00
182	ECU666	TRUE	RES1181	37	TRANS357	22	CAP738	12	IND2926	4	DIO151	12	2021-07-15T11:44:53.893545+03:00
183	ABS172	TRUE	RES1099	36	TRANS324	12	CAP669	6	IND2578	1	DIO432	17	2021-07-15T11:46:54.9001508+03:00
184	ABS518	FALSE	RES1125	47	TRANS373	24	CAP721	9	IND1062	3	DIO111	8	2021-07-15T11:48:55.9059912+03:00
185	DCU866	FALSE	RES1063	42	TRANS301	18	CAP956	8	IND2388	4	DIO486	9	2021-07-15T11:50:56.912072+03:00
186	ECU282	FALSE	RES1081	45	TRANS329	24	CAP344	12	IND3568	4	DIO764	11	2021-07-15T11:52:57.9156707+03:00
187	ABS451	TRUE	RES1107	28	TRANS385	9	CAP791	11	IND1735	3	DIO969	10	2021-07-15T11:54:58.923315+03:00

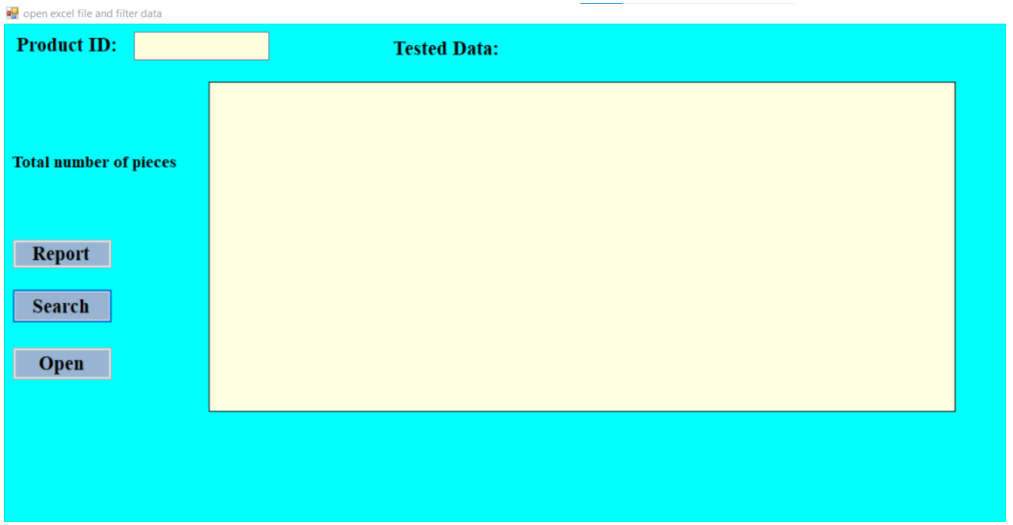
Limbaj utilizat: C#
Mediu dezvoltare: Visual Studio 2019
Primul task a fost realizarea design-ului. Am folosit mai multe forme din Toolbox-ul mediului de dezvoltare(butoane, etichete, textBox, etc.), am schimbat culoarea (stilul) interfetei.
Apoi, ne-am conectat la baza de date pentru a avea acces la toate datele produselor;

Semnificatie butoane:

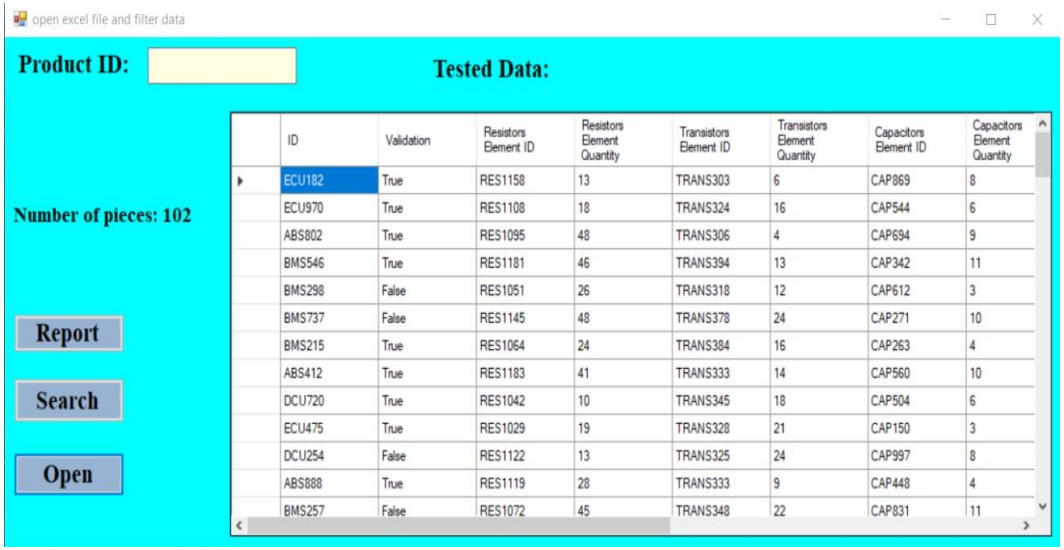
- **Open** = deschide continutul din baza de date;
- **Search** = cauta o piesa dupa ID si/sau validare, generand in interfata toate datele despre piesa respectiva;
- **Report** = filtreaza doar piesele defecte;

```
1 reference
private void buton_afisare_Click(object sender, EventArgs e){
    using(OpenFileDialog ofd = new OpenFileDialog() { Filter = "Excel Workbook|*.xlsx", Multiselect = false })
    {
        if(ofd.ShowDialog()==DialogResult.OK){
            Cursor.Current = Cursors.WaitCursor;
            DataTable dt = new DataTable();
            using(XLWorkbook workbook = new XLWorkbook(ofd.FileName)){
                bool isFirstRow = true;
                var rows = workbook.Worksheet(1).RowsUsed();
                foreach(var row in rows ){
                    if(isFirstRow){
                        //adding column
                        foreach (IXLCell cell in row.Cells())
                            dt.Columns.Add(cell.Value.ToString());
                        isFirstRow = false;
                    }
                    else{
                        dt.Rows.Add();
                        int i = 0;
                        foreach (IXLCell cell in row.Cells())
                            dt.Rows[dt.Rows.Count - 1][i++] = cell.Value.ToString();
                    }
                }
                dataGridView1.DataSource = dt.DefaultView;
                totalPiese.Text = $"Number of pieces: {dataGridView1.RowCount}";
            }

        }
    }
}
```



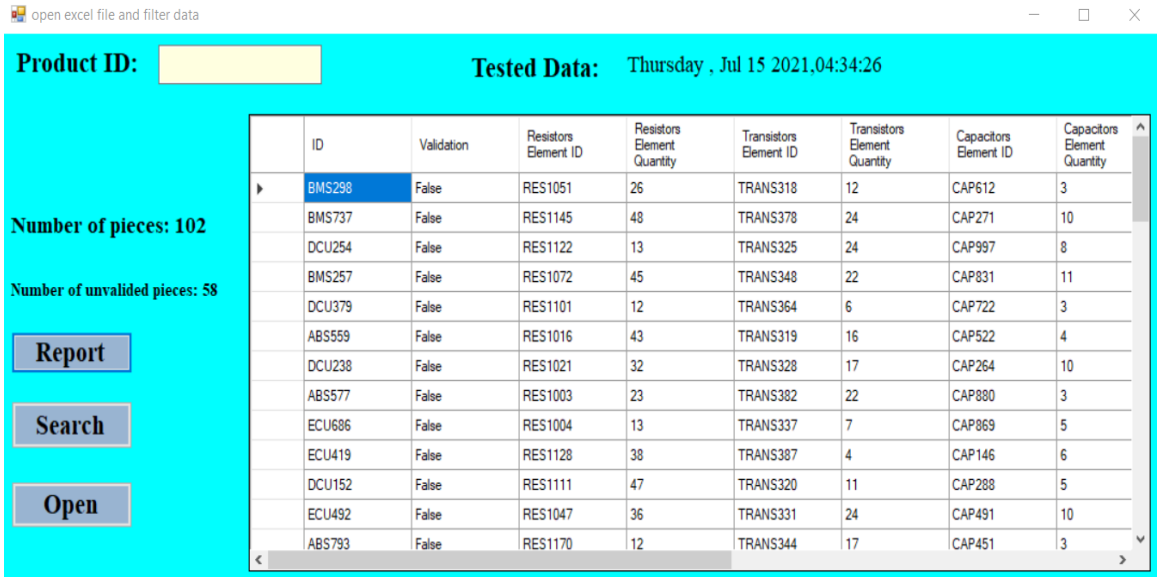
Functionalitatea interfetei



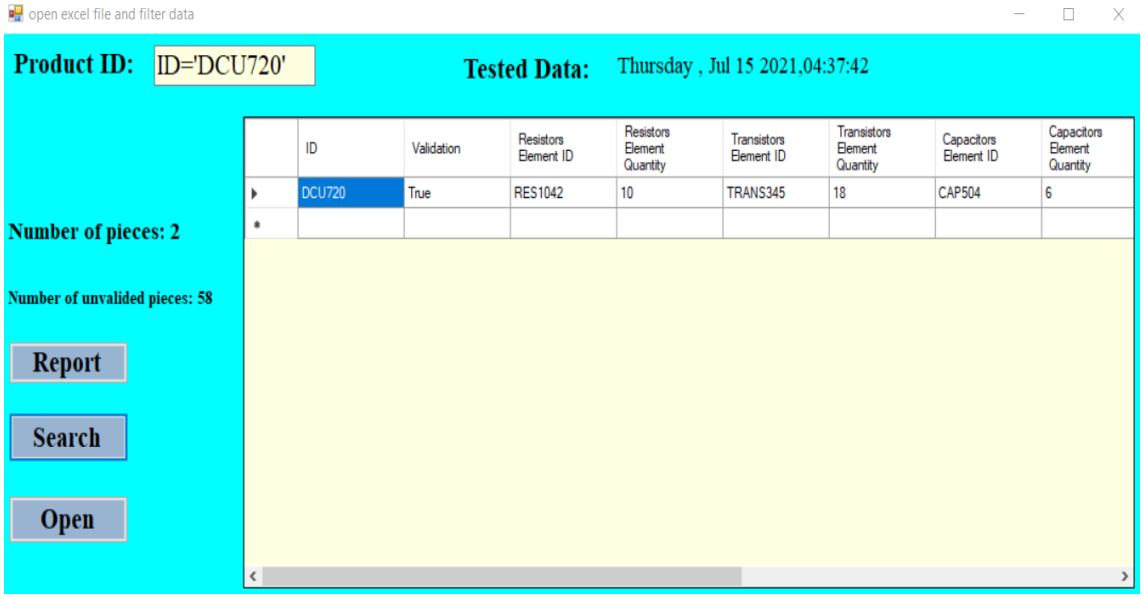
	ID	Validation	Resistors Element ID	Resistors Element Quantity	Transistors Element ID	Transistors Element Quantity	Capacitors Element ID	Capacitors Element Quantity
▸	ECU182	True	RES1158	13	TRANS303	6	CAP869	8
	ECU970	True	RES1108	18	TRANS324	16	CAP544	6
	ABS802	True	RES1095	48	TRANS306	4	CAP694	9
	BMS546	True	RES1181	46	TRANS394	13	CAP342	11
	BMS298	False	RES1051	26	TRANS318	12	CAP612	3
	BMS737	False	RES1145	48	TRANS378	24	CAP271	10
	BMS215	True	RES1064	24	TRANS384	16	CAP263	4
	ABS412	True	RES1183	41	TRANS333	14	CAP560	10
	DCU720	True	RES1042	10	TRANS345	18	CAP504	6
	ECU475	True	RES1029	19	TRANS328	21	CAP150	3
	DCU254	False	RES1122	13	TRANS325	24	CAP997	8
	ABS888	True	RES1119	28	TRANS333	9	CAP448	4
	BMS257	False	RES1072	45	TRANS348	22	CAP831	11

Afisarea continutului din baza de date
Afisarea numarului total de piese din baza.

Filtrarea pieselor defecte
Afisarea numarului de piese defecte.

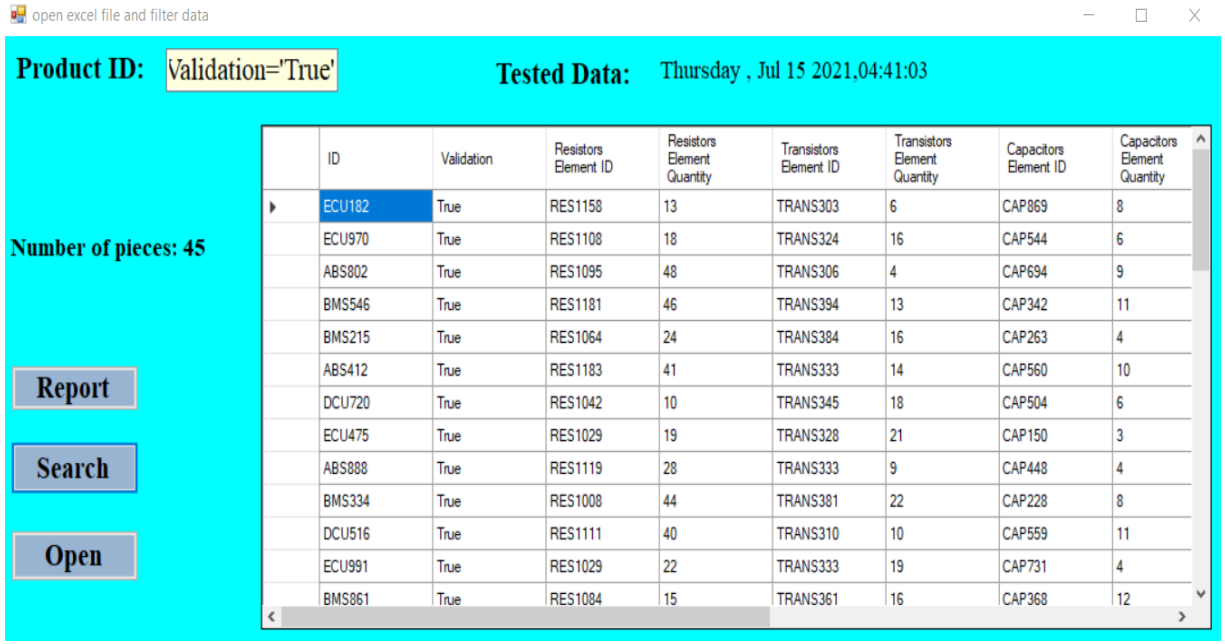


	ID	Validation	Resistors Element ID	Resistors Element Quantity	Transistors Element ID	Transistors Element Quantity	Capacitors Element ID	Capacitors Element Quantity
▸	BMS298	False	RES1051	26	TRANS318	12	CAP612	3
	BMS737	False	RES1145	48	TRANS378	24	CAP271	10
	DCU254	False	RES1122	13	TRANS325	24	CAP997	8
	BMS257	False	RES1072	45	TRANS348	22	CAP831	11
	DCU379	False	RES1101	12	TRANS364	6	CAP722	3
	ABS559	False	RES1016	43	TRANS319	16	CAP522	4
	DCU238	False	RES1021	32	TRANS328	17	CAP264	10
	ABS577	False	RES1003	23	TRANS382	22	CAP880	3
	ECU686	False	RES1004	13	TRANS337	7	CAP869	5
	ECU419	False	RES1128	38	TRANS387	4	CAP146	6
	DCU152	False	RES1111	47	TRANS320	11	CAP288	5
	ECU492	False	RES1047	36	TRANS331	24	CAP491	10
	ABS793	False	RES1170	12	TRANS344	17	CAP451	3



Cautarea unei piese in functie de ID.
Afisarea piesei cu ID-ul X cuprizand toate datele despre aceasta.

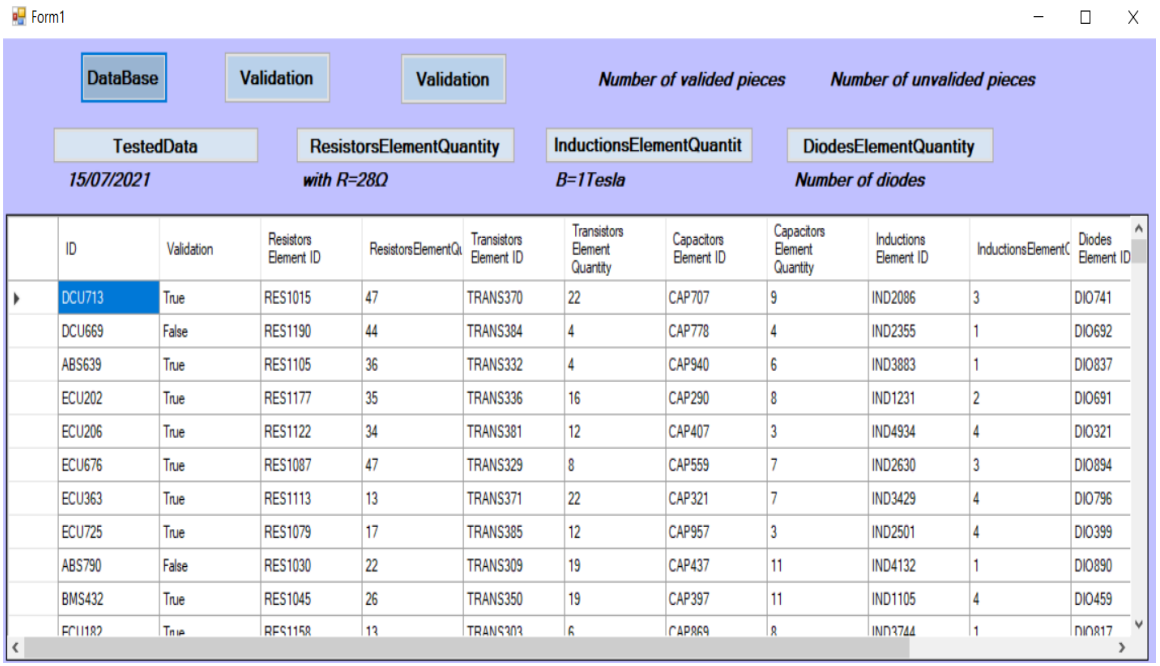
Cautarea unei piese in functie de validare.
Afisarea numarului de piese.



Pentru a contoriza testele efectuate intr-o anumita zi, in cazul de fata 15/07/2021, vom apasa butonul TestedData.

Primul buton, denumit DataBase, ne spune sa alegem baza de date dorita, apoi va face conectarea si o va afisa.

In cazul de fata, dupa rulare si apasarea primului buton, Forms-ul va arata asa:



ID	Validation	Resistors Element ID	ResistorsElementQu	Transistors Element ID	Transistors Element Quantity	Capacitors Element ID	Capacitors Element Quantity	Inductions Element ID	InductionsElementQ	Diodes Element ID
DCU713	True	RES1015	47	TRANS370	22	CAP707	9	IND2086	3	DIO741
DCU669	False	RES1190	44	TRANS384	4	CAP778	4	IND2355	1	DIO692
ABS639	True	RES1105	36	TRANS332	4	CAP940	6	IND3883	1	DIO837
ECU202	True	RES1177	35	TRANS336	16	CAP290	8	IND1231	2	DIO691
ECU206	True	RES1122	34	TRANS381	12	CAP407	3	IND4934	4	DIO321
ECU676	True	RES1087	47	TRANS329	8	CAP559	7	IND2630	3	DIO894
ECU363	True	RES1113	13	TRANS371	22	CAP321	7	IND3429	4	DIO796
ECU725	True	RES1079	17	TRANS385	12	CAP957	3	IND2501	4	DIO399
ABS790	False	RES1030	22	TRANS309	19	CAP437	11	IND4132	1	DIO890
BMS432	True	RES1045	26	TRANS350	19	CAP397	11	IND1105	4	DIO459
ECU182	True	RES1158	13	TRANS303	6	CAP869	8	IND3744	1	DIO817

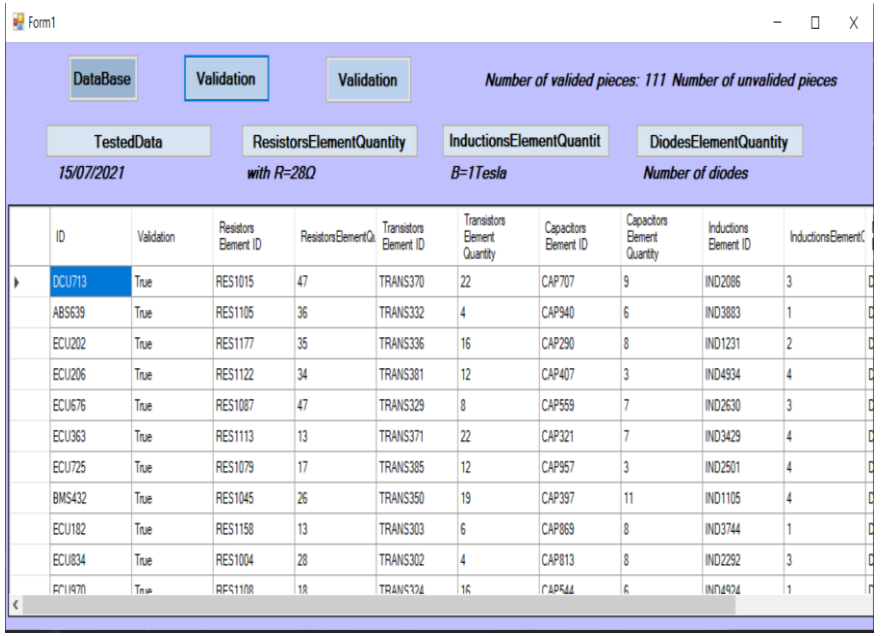
Pentru a contoriza numarul de piese care au fost validate (notate cu TRUE in DataBase), am folosit urmatorul cod:

```
private void button2_Click(object sender, EventArgs e)
{
    try
    {
        DataView dv = dataGridView1.DataSource as DataView;
        if (dv != null)
             dv.RowFilter = button2.Text;
        label2.Text = $"Number of valided pieces: {dataGridView1.RowCount}";
    }
    catch (Exception ex)
    {
        MessageBox.Show(ex.Message, "Message", MessageBoxButtons.OK, MessageBoxIcon.Error);
    }
}
```

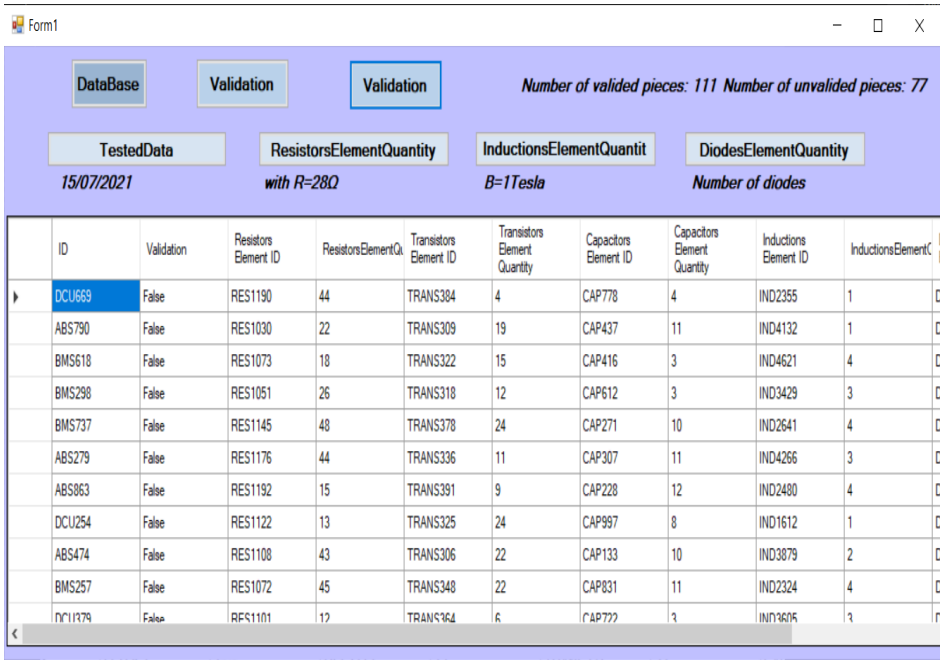
De asemenea, pentru contorizarea numarului de piese nevalidate (FALSE), codul este urmatorul:

```
1 reference
private void button3_Click(object sender, EventArgs e)
{
    try
    {
        DataView dv = dataGridView1.DataSource as DataView;
        if (dv != null)
            //  dv.RowFilter = button2.Text;
            dv.RowFilter = "Validation = False";
        label1.Text = $"Number of unvalided pieces: {dataGridView1.RowCount}";
    }
    catch (Exception ex)
    {
        MessageBox.Show(ex.Message, "Message", MessageBoxButtons.OK, MessageBoxIcon.Error);
    }
}
```

Atunci cand se foloseste butonul Validation(1), se contorizeaza numarul de validari pozitive, apoi se afiseaza toate piesele cu “True”.



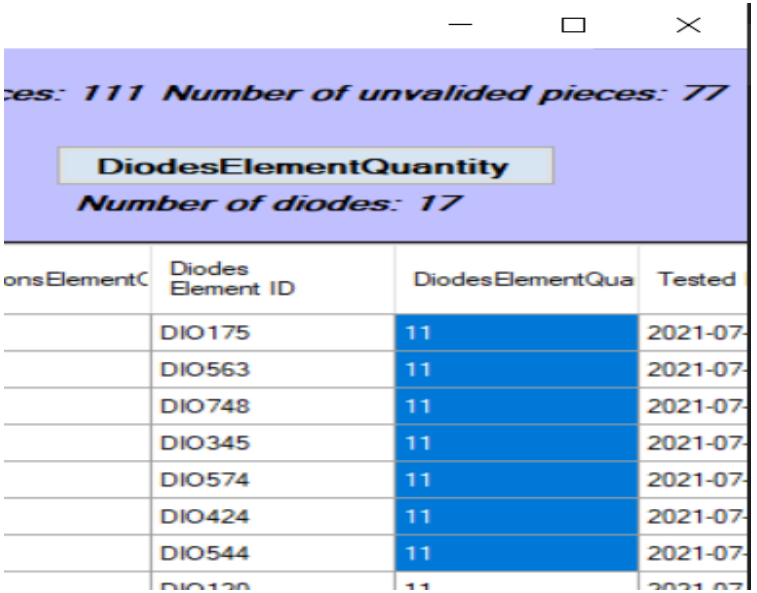
ID	Validation	Resistors Element ID	ResistorsElementQ	Transistors Element ID	Transistors Element Quantity	Capacitors Element ID	Capacitors Element Quantity	Inductions Element ID	InductionsElementQ
DCU713	True	RES1015	47	TRANS370	22	CAP707	9	IND2086	3
ABS639	True	RES1105	36	TRANS332	4	CAP940	6	IND3883	1
ECU202	True	RES1177	35	TRANS336	16	CAP290	8	IND1231	2
ECU206	True	RES1122	34	TRANS381	12	CAP407	3	IND4934	4
ECU676	True	RES1087	47	TRANS329	8	CAP559	7	IND2630	3
ECU363	True	RES1113	13	TRANS371	22	CAP321	7	IND3429	4
ECU725	True	RES1079	17	TRANS385	12	CAP957	3	IND2501	4
BMS432	True	RES1045	26	TRANS350	19	CAP397	11	IND1105	4
ECU182	True	RES1158	13	TRANS303	6	CAP869	8	IND3744	1
ECU834	True	RES1004	28	TRANS302	4	CAP813	8	IND2292	3



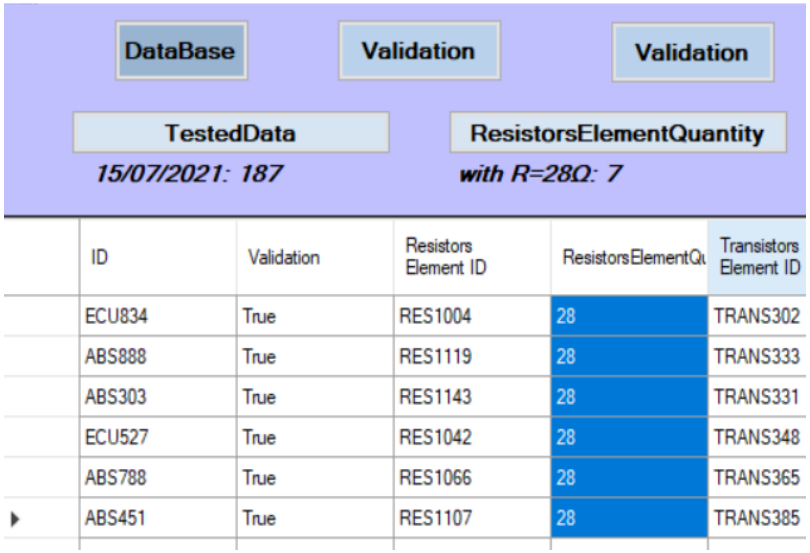
ID	Validation	Resistors Element ID	ResistorsElementQ	Transistors Element ID	Transistors Element Quantity	Capacitors Element ID	Capacitors Element Quantity	Inductions Element ID	InductionsElementQ
DCU669	False	RES1190	44	TRANS384	4	CAP778	4	IND2355	1
ABS790	False	RES1030	22	TRANS309	19	CAP437	11	IND4132	1
BMS618	False	RES1073	18	TRANS322	15	CAP416	3	IND4621	4
BMS298	False	RES1051	26	TRANS318	12	CAP612	3	IND3429	3
BMS737	False	RES1145	48	TRANS378	24	CAP271	10	IND2641	4
ABS279	False	RES1176	44	TRANS336	11	CAP307	11	IND4266	3
ABS863	False	RES1192	15	TRANS391	9	CAP228	12	IND2480	4
DCU254	False	RES1122	13	TRANS325	24	CAP997	8	IND1612	1
ABS474	False	RES1108	43	TRANS306	22	CAP133	10	IND3879	2
BMS257	False	RES1072	45	TRANS348	22	CAP831	11	IND2324	4

Atunci cand folosim butonul Validation(2), se contorizeaza numarul de validari negative, apoi se afiseaza toate piesele cu “False”.

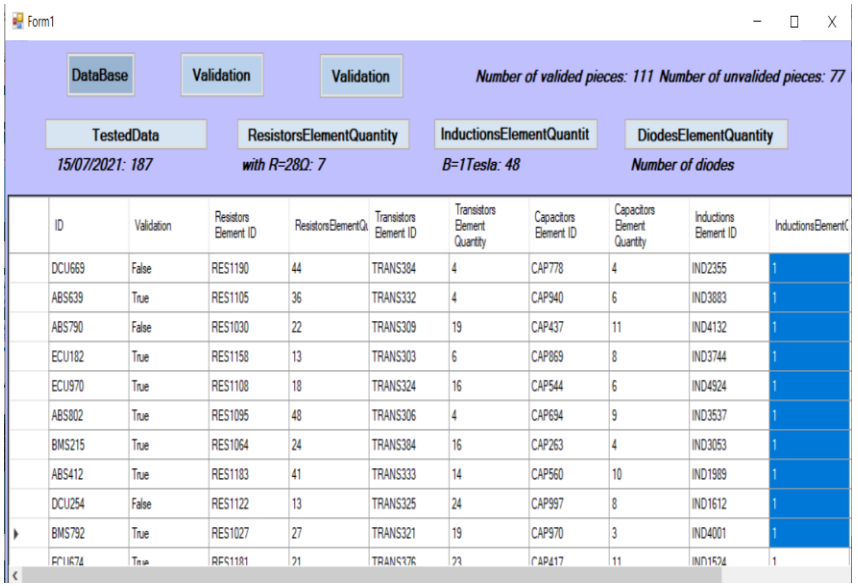
Putem oricand sa schimbam in codul C# valorile pe care dorim sa ni le afiseze programul. De data aceasta, am ales cateva valori semnificative pentru Rezistoare, Inductante si Diode, apoi le-am afisat si le-am contorizat.



ons Element C	Diodes Element ID	Diodes Element Qua	Tested
	DIO175	11	2021-07-
	DIO563	11	2021-07-
	DIO748	11	2021-07-
	DIO345	11	2021-07-
	DIO574	11	2021-07-
	DIO424	11	2021-07-
	DIO544	11	2021-07-
	DIO120	11	2021-07-



ID	Validation	Resistors Element ID	ResistorsElementQu	Transistors Element ID
ECU834	True	RES1004	28	TRANS302
ABS888	True	RES1119	28	TRANS333
ABS303	True	RES1143	28	TRANS331
ECU527	True	RES1042	28	TRANS348
ABS788	True	RES1066	28	TRANS365
ABS451	True	RES1107	28	TRANS385



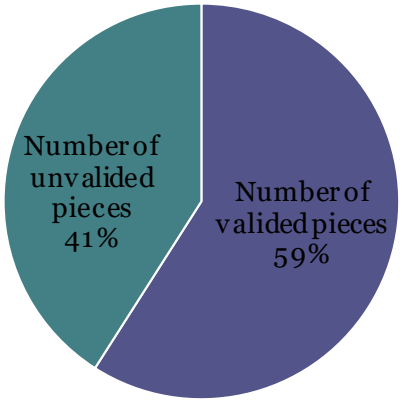
ID	Validation	Resistors Element ID	ResistorsElementQu	Transistors Element ID	Transistors Element Quantity	Capacitors Element ID	Capacitors Element Quantity	Inductions Element ID	InductionsElementC
DCU669	False	RES1190	44	TRANS384	4	CAP778	4	IND2355	1
ABS639	True	RES1105	36	TRANS332	4	CAP940	6	IND3883	1
ABS790	False	RES1030	22	TRANS309	19	CAP437	11	IND4132	1
ECU182	True	RES1158	13	TRANS303	6	CAP869	8	IND3744	1
ECU970	True	RES1108	18	TRANS324	16	CAP544	6	IND4924	1
ABS802	True	RES1095	48	TRANS306	4	CAP694	9	IND3537	1
BMS215	True	RES1064	24	TRANS384	16	CAP263	4	IND3053	1
ABS412	True	RES1183	41	TRANS333	14	CAP560	10	IND1989	1
DCU254	False	RES1122	13	TRANS325	24	CAP997	8	IND1612	1
BMS792	True	RES1027	27	TRANS321	19	CAP970	3	IND4001	1
ECU674	True	RES1181	21	TRANS376	23	CAP417	11	IND1524	1

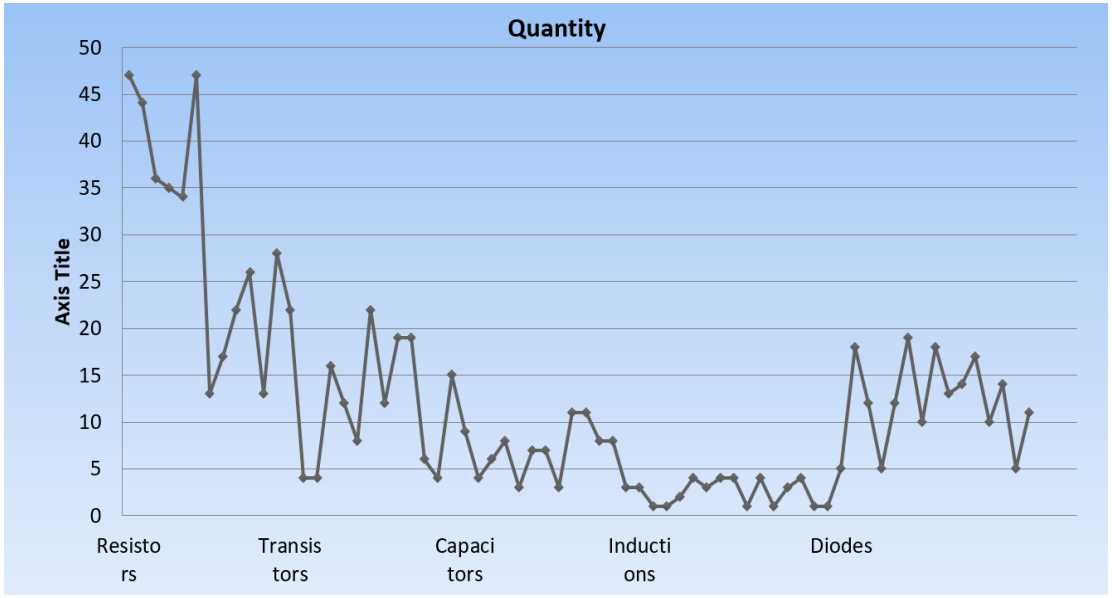
Aici am dorit sa fac o evidenta asupra fiecare cantitati a fiecarei componente.

Se observa ca cea mai mare valoare ajunge la Rezistoare, iar cea mai mica va fi la Inductante.

O valoare medie se observa ca o avem tot la Rezistoare, urmata apoi de Tranzistor.

Report statistics related to pieces in the database





- **Thank you for your attention!**