Test

Background:

Overview Wiki: the V-model (http://en.wikipedia.org/wiki/V-Model_(software_development))
Just to give a feeling of testing is a broad approach to ensure the system is well working.

Different levels of Testing

- Developer Testing (technical walkthrough)
  - Normal testing by the developer / programmer – to see it do work
- Independent and Stakeholder Testing (reviews)
  - Independent Testing denotes the test design and implementation that it is most appropriate for someone independent from the team of developers to do.
- **Unit Tests (the subject of this paper)**
  - Systematic automatic test of a unit (testing from a black box view or white box)
- Integration Test
  - integration testing is performed to ensure that the components in combination do work (e.g. that classes across packages or subsystems do work)
- System Test
  - System testing is done when the software is functioning as a whole. Does the whole system works.
- Acceptance Test
  - The users do the testing and accepting as a final test action prior to deploying the software. Check that all use-cases and all non-functional requirements work

Unit Test

A more detailed description of UnitTest is following, but first when talking of unit tests you can divide them into

White box testing – where you check all programming lines have been executed with an accepted result. See Wiki : whitebox testing

Black box testing – where you check all methods have been executed and all parameter boundaries have been checked – of cause again with an accepted result. See Wiki : blackbox testing

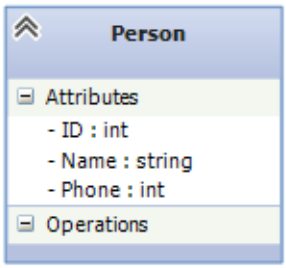
Additional reading to better understand Blackbox and Whitebox testing :
http://www.cs.unh.edu/~it666/reading_list/Defense/blackbox_vs_whitebox_testing.pdf .

How to do UnitTest In Visual Studio

https://docs.microsoft.com/en-us/visualstudio/test/walkthrough-creating-and-running-unit-tests-for-managed-code?view=vs-2019

Here is an example of the black box testing – which is the most common:

We have the class Person



ID a number between 1000-99999
Name a text which is not null and at least 4 character long
Phone a number of 8 digits

We have to set up all 'possible' input values
(normal values, values **on** the boundary, values **just outside** boundary and illegal values)

Test case #	Description of test case	Expected value	Passed successfully
1	Default constructor	Object created	
2	Set ID – value 999	ArgumentException // error	
3	Set ID – value 1000	ID == 1000	
4	Set ID – value 99999	ID == 99999	
5	Set ID – value 100000	ArgumentException // error	
6	Set ID – value 5678	ID == 5678	
7	Set ID – value -5	ArgumentException // error	
8	Set Name – value null	ArgumentException // error	
9	Set Name – value empty ("")	ArgumentException // error	
10	Set Name – value not empty but less than 4 value "123"	ArgumentException // error	
11	Set Name – value not empty and 4 value "1234"	Name == "1234"	
12	Set Name – value not empty and 15 value "123456789012345"	Name == "123456789012345"	
13	Set Phone – value 9999999	ArgumentException // error	
14	Set Phone – value 10000000	Phone == 10000000	
15	Set Phone – value 99999999	Phone == 99999999	
16	Set Phone – value 100000000	ArgumentException // error	
17	Set Phone – value 56781234	Phone == 56781234	
18	Set Phone – value -5	ArgumentException // error	
19	Constructor(2222,"Jakob",12345678)	ID == 2222 Name == "Susanne" Phone == 12345678	
20	Constructor(00999," Jakob",12345678)	ArgumentException // error	
21	Constructor(2222,null,12345678)	ArgumentException // error	
22	Constructor(2222,"Per",12345678)	ArgumentException // error	
23	Constructor(2222," Jakob",1234567890)	ArgumentException // error	