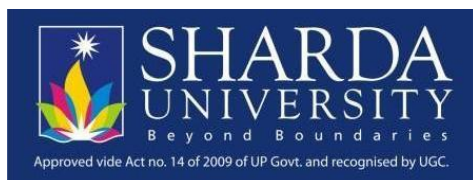# SHARDA UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SCHOOL OF ENGINEERING AND TECHNOLOGY

GREATER NOIDA

Project Report

On

"Image Steganography Using AES"

Submitted in partial fulfillment for the

Award of degree of

Bachelor of Technology

Batch 2013-2017

In

Computer science & Engineering

Submitted to:-   **Submitted by:-**

                                                                      Ashutosh Saini

Mr. P.K Mishra

Assistant Professor(CSE)

Project Guide:-

Ms. P.K Mishra

(Asst. Professor CSE)

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DECLARATION

I hereby declare that this project work submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

Place: Sharda University   **Signature of the Student:**

Date: **Name: Ashutosh Saini**

CERTIFICATE

This is to certify that the report entitled

"Image steganography using DES By Mr. Ashutosh Saini (Roll no. : 130101047) to Sharda University, towards the fulfillment of requirements of the degree of Bachelor of Technology is record of bonafidefinal year Project work carried out by him/her in the Department of Computer science School of Engineering and Technology, Sharda University. The results/findings contained in this Project have not been submitted in part or full to any other University/Institute for award of any other Degree/Diploma.

Signature of Supervisor

Name: P.K Mishra

Designation: Associate Professor

Signature of Head of Department

Name: Dr. Ishan Ranjan

(Office seal)

Place:

Date:

Signature of External Examiner
Date:

ACKNOWLEDGEMENT

A major project is a golden opportunity for learning and self development. We consider our self very lucky and honored to have so many wonderful people lead us through in completion of this project.

First and foremost we would like to thank Dr. Ishan Ranjan HOD CSE who gave us an opportunity to undertake this project.

My grateful thanks to Mr. P.K Mishra for his guidance in my project work Image Steganography Using Adcvance Encryption Standard who in spite of being extraordinarily busy with academics, took time out to hear, guide and keep us on the correct path. We do not know where we would have been without his help.

CSE department monitored our progress and arranged all facilities to make life easier. We choose this moment to acknowledge their contribution gratefully.

Name and signature of Students

Ashutosh Saini (130101051)

Table of content

1. PROJECT INTRODUCTION

The Project Image Steganography Using Triple DES is mainly about how we can secure our information using graphic level as well as Data Encryption Standard level security.

1.1 MOTIVATION

To work on this project my main motivation is through the use and benefits of image steganography allowing the encryption standard over it. As a computer science student we have a lot of eagerness to learn new things. This project is one of the reason of that eagerness to convert it to a working product.

Learning the capabilities of DNS and image processing that we learned in our semester subjects, I convinced my mind to work over the project. I chose this project because this project provides with many opportunities as mentioned in further description.

1.2 OVERVIEW

The software application purpose is to provide security to the user essential information. It helps in securing the data and hiding it such that any unknown person cannot understand it. By this the user can easily share its secured data anywhere, anytime. The goal is to work this concept around big industries where every data is valuable. Since the data needs to be secured and maintained across industry so this technique can be used.

1.3 EXPECTED OUTCOME

By this the user can easily share its secured data anywhere, anytime. As far as the business strategies are concerned what benefit it can bring is that this product can really much help you grow your business by selling to this product to big corporate industries, they are always in need of such products.

1.4 GANTT CHART

Task Completion

Task	September	December	January
	Progress		
	Date		
Learning Image	1-10	-	-
Steganography	10-20	-	-
Window Console Development	21-30	-	-
Image Steganography Implementation	-	-	-
DES Standard algorithms	21-30	01-15	-
Encryption/Decryption	-	01-31	01-30
Triple DES Implementation	-	-	-
Database Fetching And Web Deployment	-	-	-
UI Interface	-	-	-

Source: Fictitious data, for illustration purposes only

1.5 POSSIBLE RISKS

Seeing the importance of this project there are minimal possible risks involved with it. Considering the encryption algorithm which is used in this project, if one can decrypt the data. Also if one can have the ability to analyse the image and find the hidden data in the image then only customer data is at risk. But the chances are minimal.

1.6 SRS

Revision History

Name	Date	Reason For Changes	Version
Image Steganography using Triple DES	15/10/16	First Description	V1.0
	18/11/16	Project Report	V2.0

1.6.1 INTRODUCTION

1.6.1.1 PURPOSE
The purpose of this document is to present a detailed description of the Image Steganography System and the purpose of the product is to develop a Web Application that can be used for Image Steganography using the technique of triple DES for added security. version V2.0, It covers the concept of encrypting and decrypting the text message and hiding it in an image.

1.6.1.2 DOCUMENT CONVENTION
No conventions used yet.

1.6.1.3 INTENDED AUDIENCEAND READING SUGGESTIONS
This document is intended for developers, project manager, users, testers, and documentation writers. The rest of the SRS contains information about the scope of the document and project as well as the respective module functions, characteristics, operating environment, user interface and design.

1.6.1.4 PRODUCT SCOPE
The software application purpose is to provide security to the user essential information. It helps in securing the data and hiding it such that any unknown person cannot understand it. By this the user can easily share its secured data anywhere, anytime. The goal is to work this concept around big industries where every data is valuable.

Since the data needs to be secured and maintained across industry so this technique can be used. As far as the business strategies are concerned what benefit it can bring is that this product can really much help you grow your business by selling to this product to big corporate industries, they are always in need of such products. The idea is just to present in appropriate way to grasp our idea of securing the world data.

1.6.2   OVERALL DESCRIPTION

1.6.2.1 PRODUCT DESCRIPTION
The product defines itself as the element of secureness of important data. This product is unique and is of great importance to larger or big systems. The aim of the product is to secure every kind of message used in corporate, mainly the text message. Firstly it encrypt the message and then using image steganography we hide the data inside the image.

1.6.2.2 PRODUCT FUNCTIONS
- The user can encrypt the respective message.
- They can also decrypt the message.
- They can hide the encrypted message in an image using image steganography.
- The image can therefore be used as a secure media which can be transmitted anywhere.
- Later the user can decode the image and find the encrypted data.
- Using the unique key the data can be extracted.
-

1.6.2.3 USER CLASSES AND CHARACTERISTICS
User classes are still on developing stage and they will be developed in upcoming version .

1.6.2.4 OPERATING ENVIRONMENT
The environment in which the product is developed uses:
- Microsoft Visual Studio 2013
- SQL Server 2014
  The hardware platform over which this product can operate in general includes:
- Microsoft Windows 8 or above
- intel i3 processor or above or any other processor of similar configuration.
- 1.4~3.0 Ghz speed of clock
  The application must be runnable in every system and can be transferred and shared easily. Even in different operating systems it must work properly with efficiency.

1.6.2.5 DESIGN AND IMPLEMENTATION CONSTRAINTS

The product is highly secure and uses Visual Studio C# and SQL server which are both integrated with each other.

1.6.2.6 USER DOCUMENTATION

Most of the help to develop and work on the project was taken from the following:
- MSDN(Microsoft Developer Network)
- C#Corner
- StackOverflow

1.6.2.7 ASSUMPTIONS AND DEPENDENCIES

The project is very secure and external dependencies are minimal. There are not much external factors affecting the environment and working of the project but a few:
- If the working operating system changes.
- If the user tries to fetch invalid data.

1.6.3 EXTERNAL INTERFACE REQUIREMENTS
1.6.3.1 USER INTERFACES

The samples in the project shows the window form in which we have text box to give input regarding the text to be encrypted. Following the input, as the user clicks a button the text will be hidden under the image. If the user gives the wrong or invalid input then it asks again for a valid input.

1.6.3.2 HARDWARE INTERFACES

The supported device types may include:
- All types of operating system on laptops, desktops.
- All smartphone devices
  The GUI implemented is supported by every environment on which it is running.

1.6.3.3 COMMUNICATION INTERFACE

Since the product is web based application, simple HTTP standard will be used to open the application. Apart from this for initial working the product will be working over localhost address. Web browser supported are Internet Explorer, Mozilla Firefox and Google Chrome. The product can be downloaded from a site.

CHAPTER - 2
METHODOLOGY

2.1 BRIEF INTRODUCTION TO AREA

The project covers fields of windows programming regarding image steganography and applying triple DES algorithm to make data secure. Image Steganography is the process by which a useful data can be hidden in the pixels of an image. The advantage of steganography over cryptography is that the intended secret message does not attract attention to itself as an object of scrutiny. Plainly visible encrypted text, no matter how unbreakable-arouse interest and may be incriminating in countries where encryption is illegal. Whereas cryptography is the practice of protecting the contents of a message alone, steganography is concerned with concealing the fact that a secret message is being sent, as well as concealing the contents of the message.

Triple DES on the other hand helping in such a way that it uses three keys for encryption/decryption process. In general, Triple DES with three independent keys (keying option 1) has a key length of 168 bits (three 56-bit DES keys), but due to the meet-in-the-middle attack, the effective security it provides is only 112 bits. Keying option 2 reduces the effective key size to 112 bits (because the third key is the same as the first).
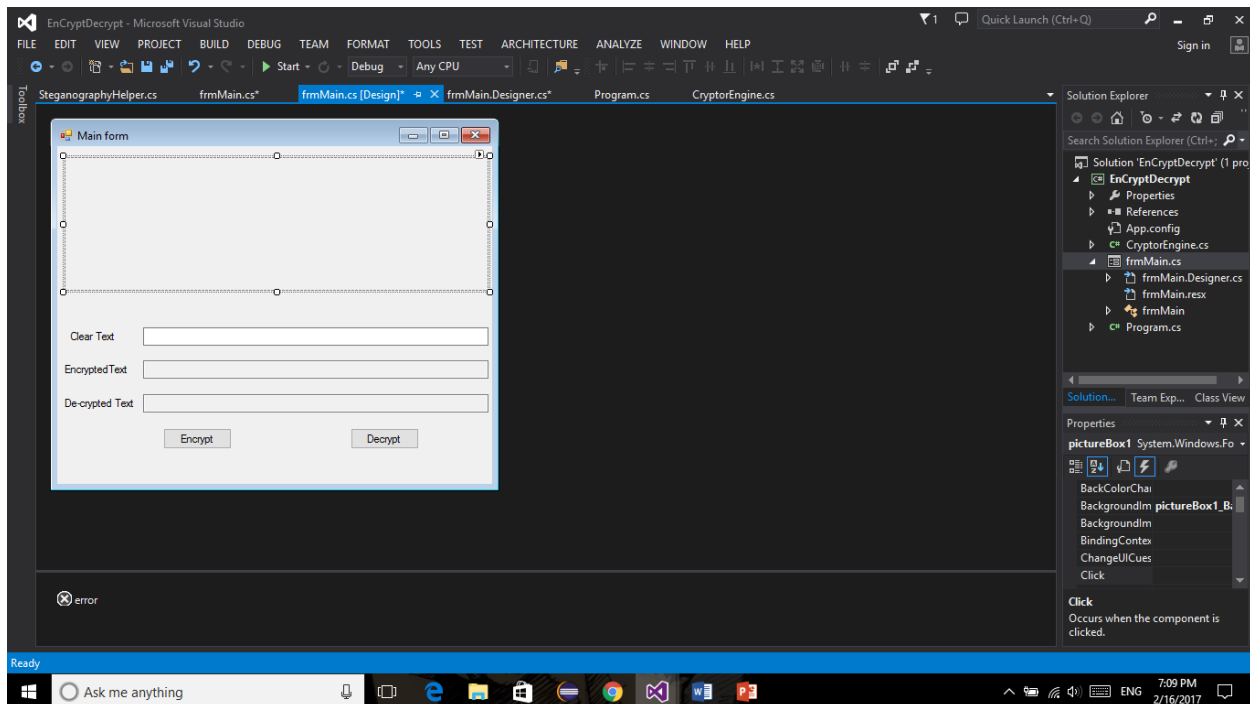
2.1 PRODUCT/SYSTEM VIEW

Fig.1.1

2.2 SYSTEM COMPONENTS AND FUNCTIONALITIES

The System components includes various parts. Some of which are :
1. Image Viewer : To hide the data in the image.
2. Text Box : To input the text which needs to be hidden.
3. Password TextBox :To provide Security which is used during decryption process.
4. Hide(Encrypt) Button : Encryption Button
5. Extract(Decrypt) Button : Decryption Button

Note: The above illustration is just for describing purpose only. Further changes may be made over the product.

2.3 DATA AND RELATIONAL VIEWS

As far as relational view is concerned, there is no database view. The product is working over normal input through a method. For long term session the inputs or data will be stored in database SQL and fetched from there to provide input in textbox.

CHAPTER – 3
DESIGN CRITERIA

3.1 SYSTEM DESIGN

The samples in the project shows the window form in which we have text box to give input regarding the text to be encrypted. Following the input, as the user clicks a button the text will be hidden under the image. If the user gives the wrong or invalid input then it asks again for a valid input.
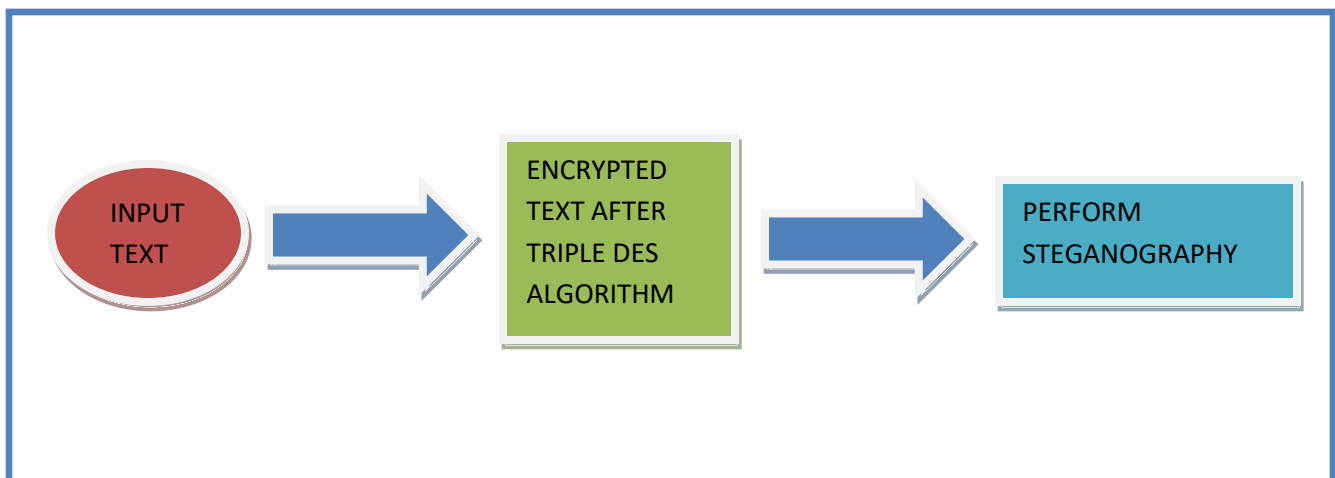
The above figure shows the overall procedure of the product. This shows how the product components will work and what they are going to perform. The circular part shows the input text which is to be hide and encrypted. The arrow part shows the flow of implementation. The rectangular part shows the process that is performed over the text. The middle box shows the text is encrypted. The last box shows us that the encrypted text is then hidden using steganography.
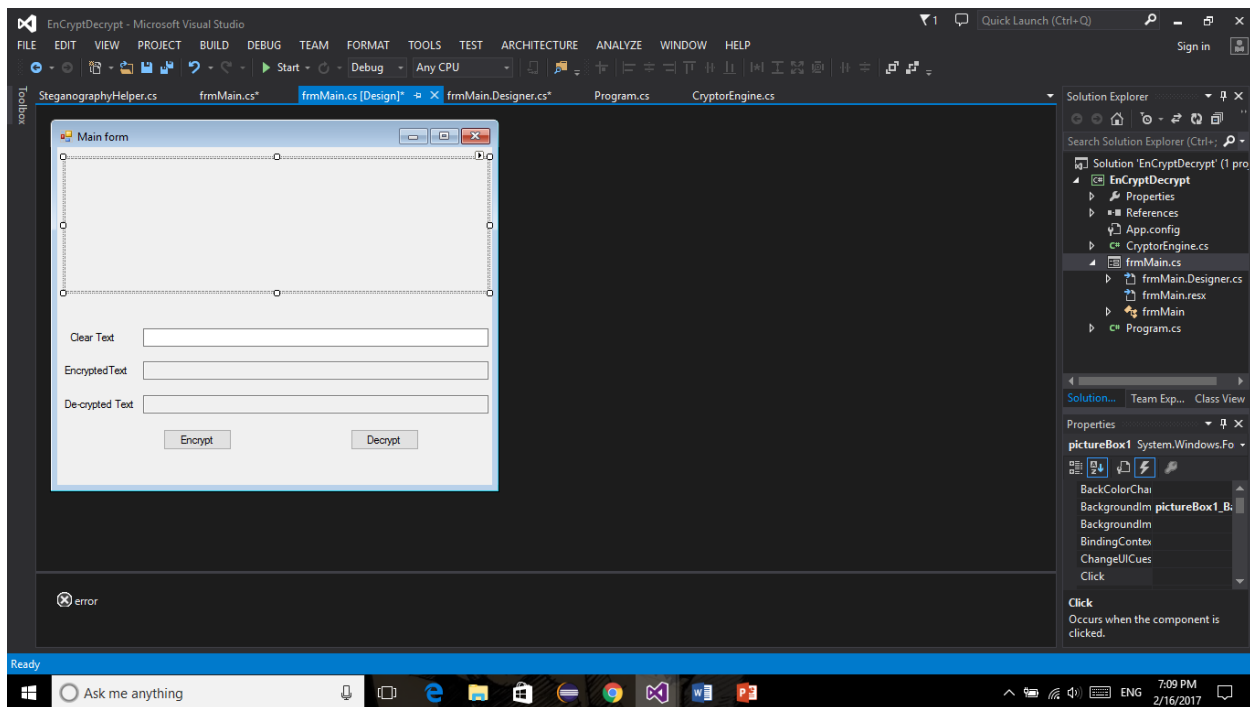
3.2 DESIGN DIAGRAM
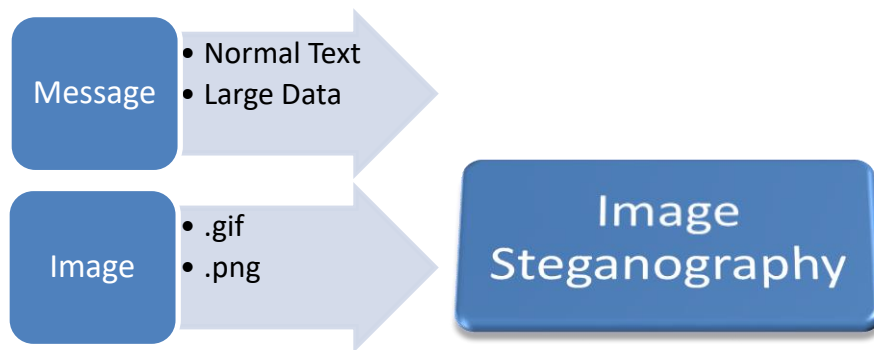
4. Development

Updated Synopsis

The folowing document provides certain updated modules in the project Image Steganography using Triple DES. As we move through the documentation we will see new implementation and some modification in the project working.

Updated System Design

The above image shows a change in the module while developing the project. As planned the project was supposed to have encryption/decryption using Triple DES. Here the picture shows the interface of text that needs to be encrypted, a column of encryped text and a box of decrypted text.

Compliance with Proposed Design

Considering the rules and flow that needs to be followed during making of this project, it follows every rule given in the guidelines by the project head committee. The part of encrypting and decrypting message with the help of Triple DESis done effectively. As the design describes a glimpse of working of the module, it is not up to the mark till now. The implementation of Image Steganography is still on the way of development.

Flow of Development/Development Plan

The flow of the project follows the Waterfall model. Waterfall model has certain procedures that needs to be followed. These procedures are
1) Requirements
2) Design
3) Implementation
4) Verification
5) Maintenance

Considering these rules followed, the project first included gathering of requirements needed to develop this project. Requirements included concepts to follow, environment needed to develop the code etc. After this a rough design was made of the odule how it should look. Implementation included

development of code of Triple DES and interface of it. Verification and maintenance will be discussed in next topic.

Modules Completed

As far as the modules developed are concerned, the main modules that are completed while developing this project are:
1) Interface of Encryption/Decryption
2) TripleDES Algorithm development
To see it in a way of working, these modules are working properly. The interface is includes encryption/decryption process, Triple DES algorithm. One more module is left which is of Image Steganography.

Constraints and Limitations

There are certain limitations in the project. Some of them are:

1) Since the project development follows Waterfall model. If there is any error in the project module the whole process needs to be followed again.

2) The part of Image Steganography still needs to be implemented.

3) The user Interface is not so attractive for the time being.

5.Testing

The testing is an important job in any project development. There are many types of test cases developed and test rules followed to implement and validate a project.

Testing Strategy

Test strategy is defined as a set of guiding principle that enlightens test design & regulates how testing needs to be done. Test strategy in this project included objectives, scope, documentation format, reporting structure etc. It included types of modules tested and how they are tested. The part of algorithm development and how to test it included the testing like integration testing and beta testing.

Test Plan

A test plan for software project can be defined as a document that defines the scope, objective, approach and emphasis on a software testing effort. There are certain test techniques followed to make the project. Also pass or fail criteria is also kept in mind while the responsibilities are followed well. The

project testing is only done by the developer itself. But further testing by individuals will be also done soon keeping in mind the required test cases to be followed.

Samples of Test Cases

Case 1: This is a kind of beta testing in which user inputs and the user gets respective output. If the user gives wrong input or if some invalid characters are added which are not in accordance with the required input then the module fails the testing procedure.
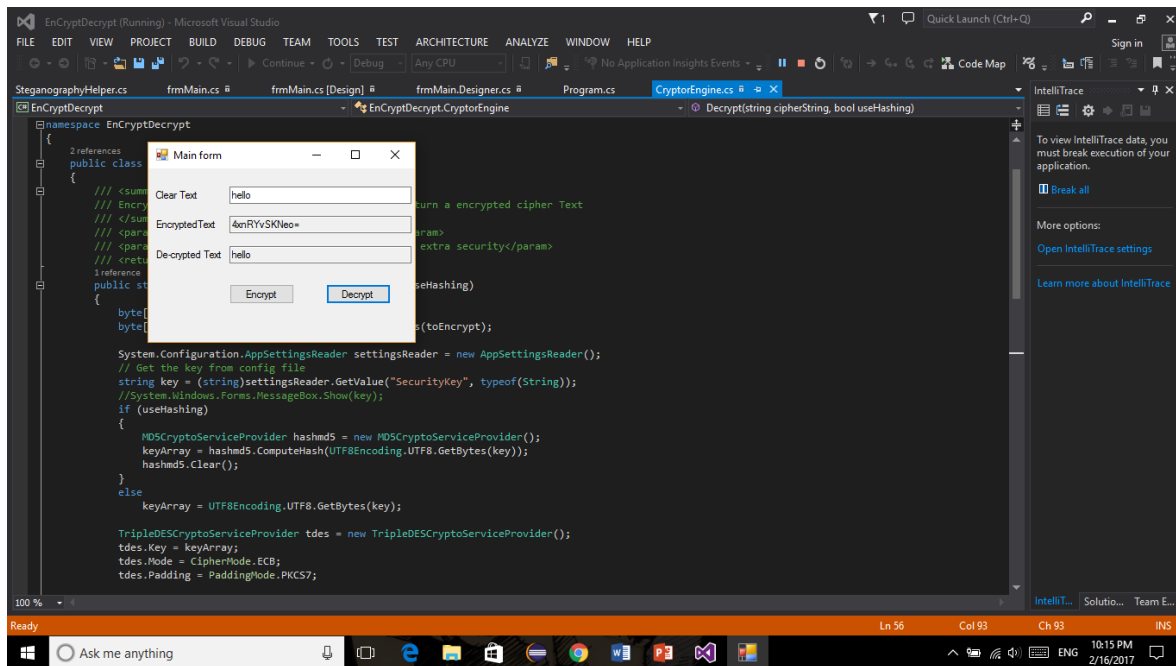
Unit Testing/Integration Testing Results

The testing involves both Unit and integration testing. Unit testing involves small methods testing by debugging the code. The integration testing comes into picture as we develop the methods and test them by integrating them within a class. Other classes and designer class are also integrated in and then tested if they work properly or not.

Product Quality Assurance

Till the product is not developed completely we cannot predict its overall quality.

REFERENCES

- www.Github.com
- www.geeksforgeeks.com
- www.Wikipedia.com/imagesteganography
- www.Wikipedia.com/TripleDES