Weather Forecast Website

A mini–Project Report submitted in partial fulfilment of the requirements for the award of the degree of

Bachelor of Technology

in

Computer Science and Engineering

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<u>Declaration</u>

We hereby declare that the work which is being presented in the Mini Project "**Weather forecast website",** in partial fulfilment of the requirements for Mini Project viva voice, is an authentic record of our own work carried under the supervision of Ms.Madhu **, Technical Trainer, Department of CEA.**

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BONAFIDE CERTIFICATE

Certified that this project report **"Weather Forecast Website"** is the bonafide work of "**Lalit Dubey , Gaurang Lavania and Akash Purohit"** who carried out the project work undermy/our supervision.

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Submitted for the project viva-voce examination held on

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ACKNOWLEDGEMENT

The success and final outcome of this project required a lot of guidance and assistance from many people and we are extremely privileged to have got this all along the completion of my project. All that we have done is only due to such supervision and assistance and we would not forget to thank you

We respect and thank Ms.Madhu for providing me an opportunity to do the project work and giving us all support and guidance, which made us complete the project duly. We are extremely thankful to her for providing such a nice support and guidance, although she had a busy schedule managing the corporate affairs. We owe our deep gratitude to our project guide Ms.Madhu who took keen interest in my project work and guided us all along, till the completion of our project work by providing all the necessary information for developing a good project. After doing this project we can confidently say that this experience has not only enriched me with technical knowledge but also has unparsed the maturity of thought and vision. The attributes required in being a successful professional.

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<u>ABSTRACT</u>

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 Currently, operational weather forecasting systems use observations to optimize the initial state of a forecast without considering possible model deficiencies. For precipitation assimilation, this could be an issue since precipitation observations, unlike conventional data, do not directly provide information on the atmospheric state but are related to the state variables through parameterized moist physics with simplifying assumptions. Precipitation observation operators are comparatively less accurate than those for conventional data or observables in clear-sky regions, which can limit data usage not because of issues with observations but with the model. The challenge lies in exploring new ways to make effective use of precipitation data in the presence of model errors. This study continues the investigation of variational algorithms for precipitation assimilation using column model physics as a weak constraint. The strategy is to develop techniques to make online estimation and correction of model errors to improve the precipitation observation operator during the assimilation cycle

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INTRODUCTION

1.1 Overview

This system was intended to develop an application for weather prediction to perform functionalities like accessing the basic information of atmosphere to provide the convenient information to the users.

The Weather prediction provide the accurate data by maximizing the accuracy , reducing of time consumption and makes the process of weather prediction simple and fast.

1.2 Objective

Weather Prediction is a website for people to get details of weather through online. A Weather app is to show people that they can explore new places and grow new crops without worrying about the weather they are not familiar with and give them information and facts about the weather they are going to face.

1.3 Organization of the Project

- In the next chapter the technology review is defined which includes terms like HTML, CSS, JavaScript.

- In the next chapter we deal with the software design. It includes the various data flow diagrams, use case diagrams etc.

- The following chapter implementation which includes all the output screens.

- The next chapter deals with the software testing.

- Final chapter has the conclusion part.

TECHNOLOGY REVIEW

2.1 HTML

HTML stands for Hyper Text Markup Language, which is the most widely used language on the web to develop web pages. HTML was created by Berners-Lee in late 1991.

HTML is a must for students and working professionals to become a great software engineer specially when they are working in Web Development Domain. Some advantages of learning HTML are:

- You can create a website or customize an existing web template if you know HTML well.

- If you want to start a career as a professional web designer, HTML and CSS designing is a must skill.

- If you want to optimize your website, to boost its speed and performance, it is good to know HTML to yield best results.

2.2 CSS

Cascading Style Sheet (CSS) is a style sheet language. CSS is one of the core language of the open web and is standardized across Web browsers. CSS is used to style and lay out web pages, for example- to alter the font, color, size and spacing of your content, split it into multiple columns, or add animations and other decorative features. The name cascading comes from the specified priority scheme to determine which style rule applies if more than one rule matches a particular element. This cascading priority scheme is predictable.

2.3 JAVASCRIPT

JavaScript is a programming language that adds interactivity to your website (for example games, responses when buttons are pressed or data is entered in forms, dynamic styling, and animation). JavaScript itself is fairly compact yet very flexible. Developers have written a large variety of tools on top of the core JavaScript language, unlocking a vast amount of extra functionality with minimum effort. These include:

- Browser Application Programming Interfaces (APIs) — APIs built into web browsers, providing functionality like dynamically creating HTML and setting CSS styles, collecting andmanipulating a video stream from the user's webcam, or generating 3D graphics and audio samples.
- Third-party APIs — Allow developers to incorporate functionality in their sites from other content providers, such as Twitter or Facebook.

- Third-party frameworks and libraries — You can apply these to your HTML to allow you to rapidly build up sites and applications.

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SOFTWARE DESIGN

Software design is the process of implementing software solutions to one or more sets of problems. One of the main components of software design is the software requirements analysis (SRA).

3.1 Data Flow Diagram:

A DFD also known as a 'bubble chart', has the purpose of clarifying system requirements and identifying those transformations. It shows the flow of data through a system. It is a graphical tool because it represents a picture. The DFD may be partitioned into levels that represent increasing information flow and functional details.
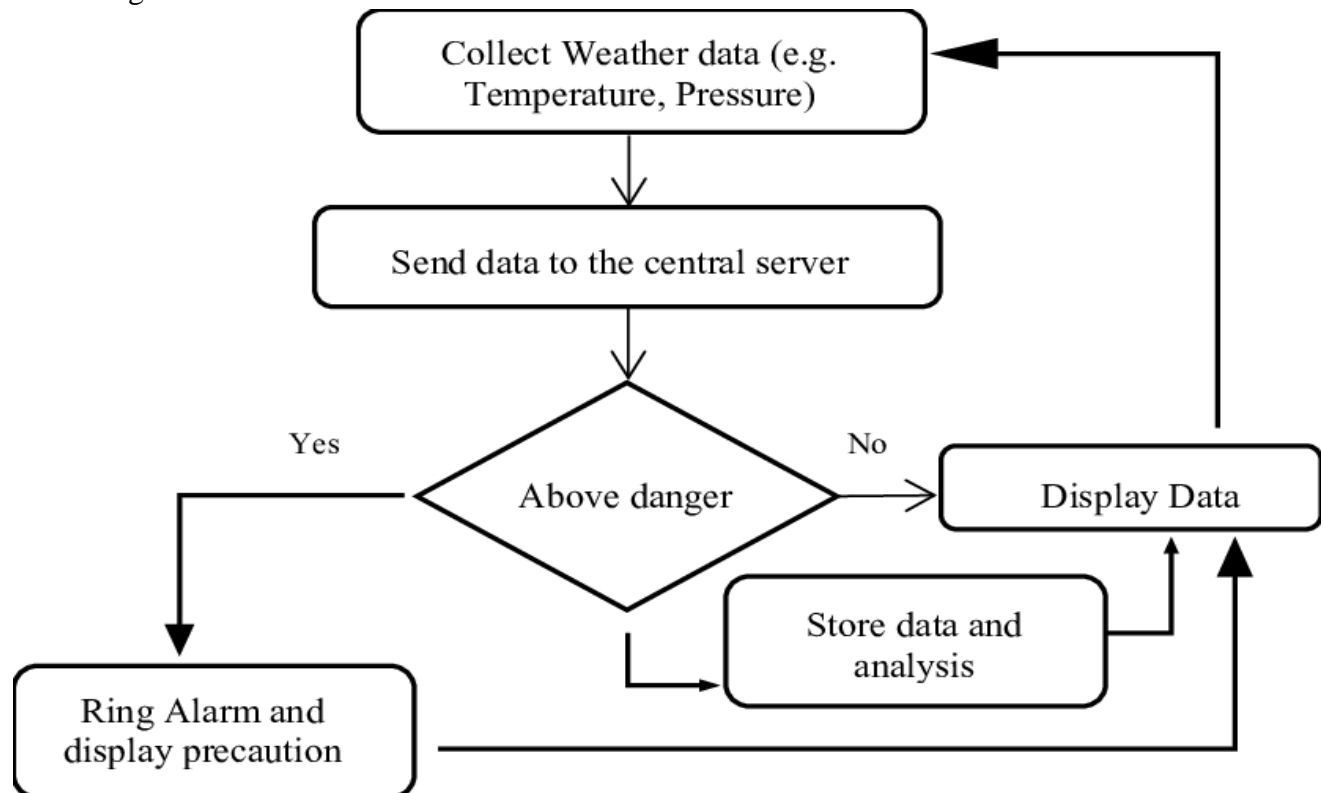
Fig.3.1 0-level DFD

3.2 Use Case Diagram:

Use Case Diagram gives a graphic overview of the actors involved in the system, different functions needed by those actors and how these different functions are interacted.

The purpose of this is to capture the dynamic aspect of a system. However, this definition is too generic to describe the purpose. Use Case Diagrams are used to gather the requirements of a system including internal and external influences. These requirements are mostly design requirement
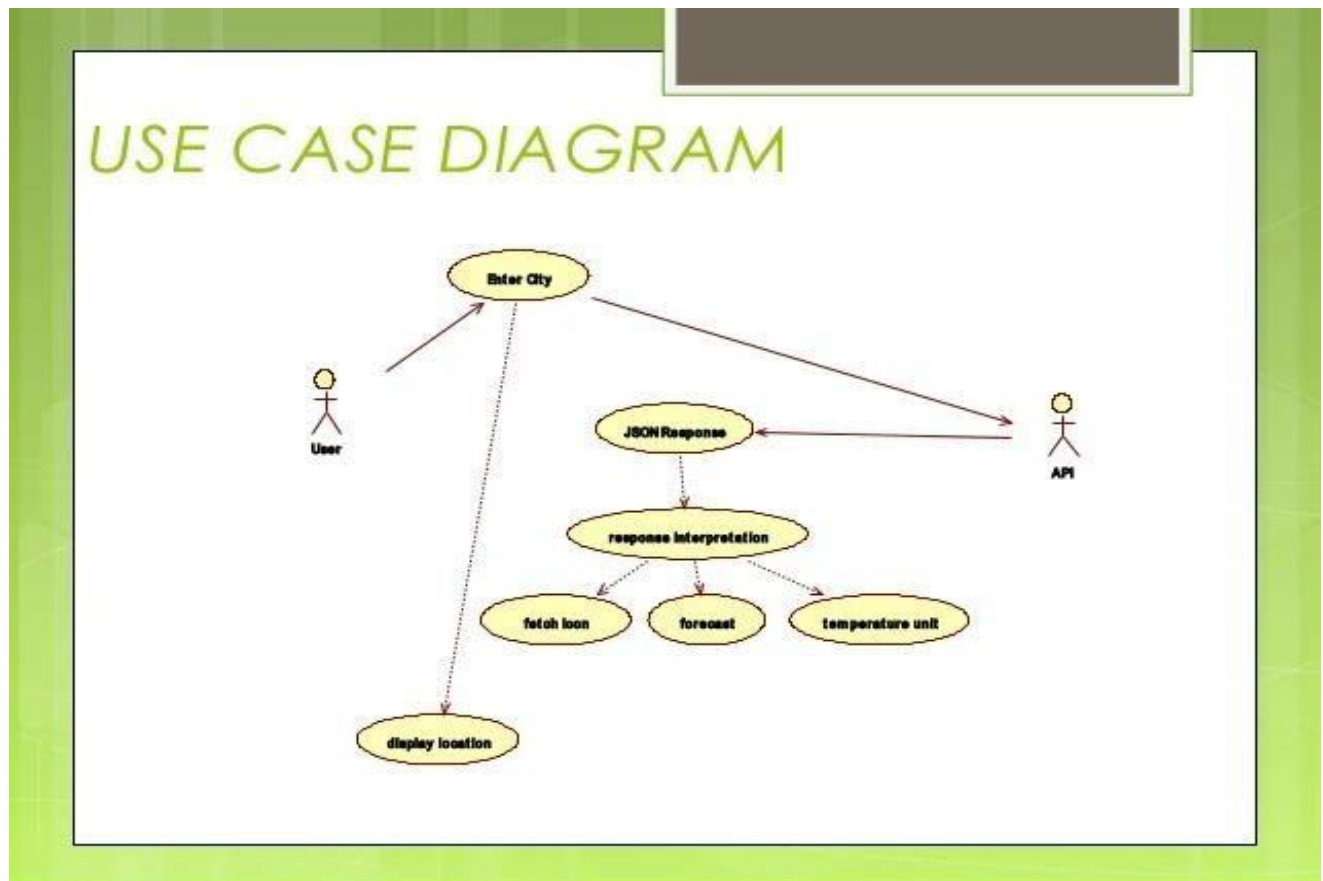

Fig. 3.2 Use Case Diagram

IMPLEMENTATION AND USER INTERFACES

In this chapter we describe the various interfaces in the project like user interfaces, software interfaces and hardware interfaces. In the end output screens are shown depicting various screens in the system.

4.1 User Interfaces:

User interface is a part of software and is designed in such a way that it is expected to provide the user inside of the software. The UI provides fundamental platform for human computer interaction. UI can be graphical, text based, audio-video based, depending upon the underlying hardware and software combination.

4.2 Software Interfaces:

3.1.a Front End: HTML, CSS, JavaScript

3.1.b Operating System: Windows 10

4.3 Hardware Interfaces:

3.2.a Processor: Intel CORE i5

3.2.b Hard Disk: 64 gb

3.2.c RAM: 8 GB

Methodology

Weather forecasting is the use of science and technology to forecast atmospheric conditions for a certain place and period. For centuries, people have tried to forecast the weather informally, and officially since the nineteenth century. Weather forecasting, which used to be done by hand and was focused mostly on variations in barometric pressure, existing weather patterns, and sky state or cloud cover, is now done using computer-based models that account for a variety of atmospheric variables. Weather predictions are created by gathering objective data about the actual condition of the atmosphere at a certain location and using meteorology to predict how the weather will behave in the future. Human feedback is also required to choose the best possible forecast model on which to base the forecast. Weather forecasting is a part of the economy; for example, the United States spent $5.1 billion on weather forecasting in 2009, with gains expected to be six times that amount. Since we know the weather forecast, let us take a look at the importance of weather forecasting pdf and the different methods used to forecast.

IMPORTANCE OF WEATHER FORECASTING

There are various uses of weather forecasting in day-to-day life, it can be as simple as deciding whether to take an umbrella with you on your work or to deciding your outfit. Following are some of the places where weather forecasting plays a major role:

Seasons and nature play a major role in agriculture and farming. When it comes to the farming of various fruits, vegetables, and pulses, temperature is extremely important. Farmers didn't have a better understanding of weather forecasts before, so they had to rely on estimates to do their jobs. They do, however, sometimes suffer losses as a result of inaccurate weather forecasts. Farmers will now get all of their forecasts on their smartphones, thanks to advances in technology and the use of unique weather forecasting mechanisms. Of course, education in this area is critical, but the majority of the farmer community at this point understands the fundamentals, making it simple for them to use the features

Weather Forecasting is crucial since it helps to determine future climate changes. With the use of latitude, we can determine the probability of snow and hail reaching the surface. We are able to identify the thermal energy from the sun that is exposed to a region. Climatology is the scientific study of climates, which in simple words mean weather conditions over a period. A bunch of studies within atmospheric sciences also takes the help of the variables and averages of short-term and long-term weather conditions accumulated. Climatology is different from meteorology and can be divided into further areas of study. Different approaches to this segment can be taken. Currently, our primary research goal is to motivate and help the development of efficient and effective measures of Environmental activities
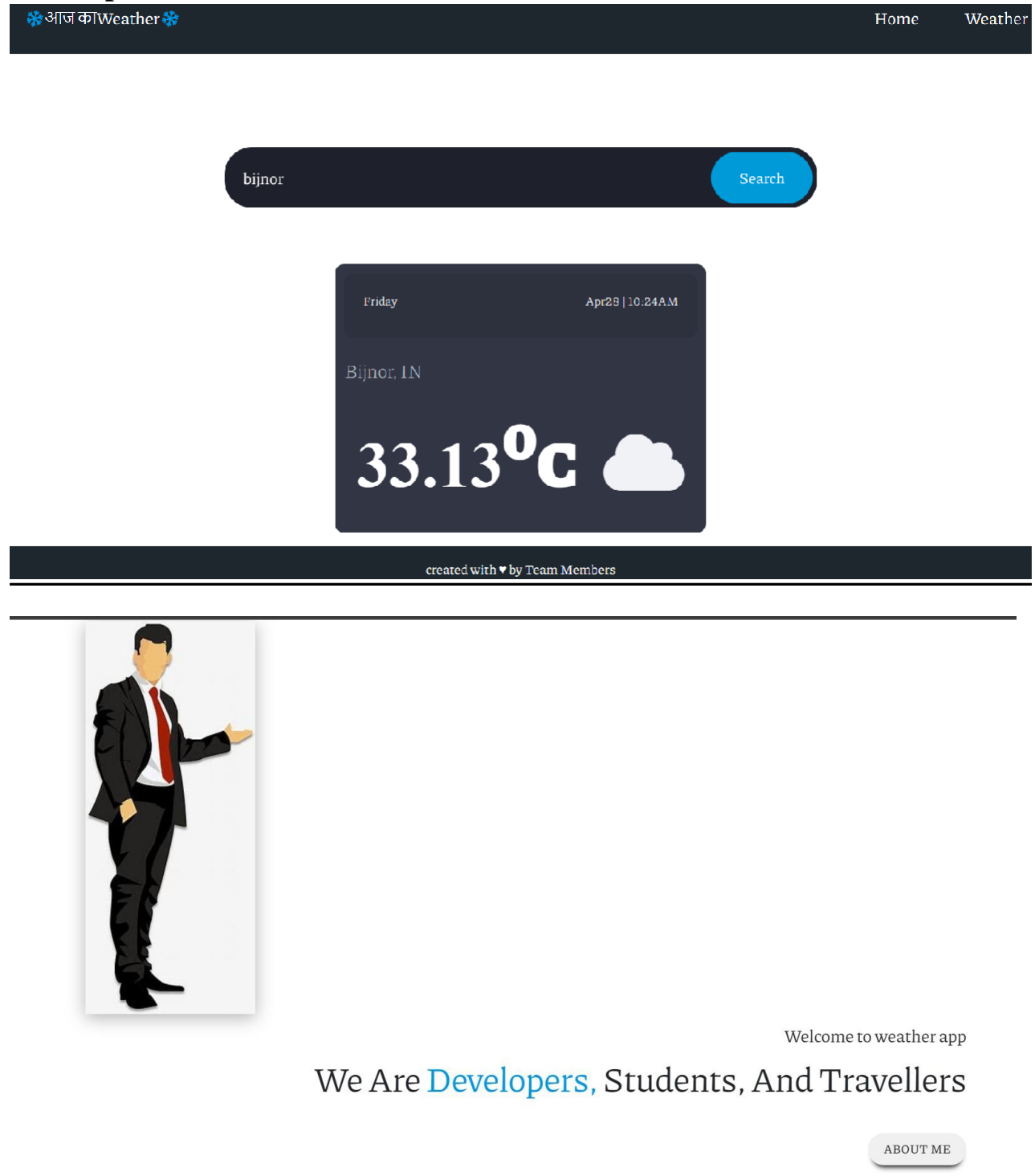
Types of Weather Forecasting

Short Range Forecasting: This forecasting will last 1-2 days.The weather has an immense influence on human daily patterns, the production of food, and personal comfort zones. Forecasting plays an important role in planning current and future activities. So, there are other aspects that may have a huge impact on the forecasting outcome. However, accurate forecasting is very crucial. Forecasting is an important tool for various analyses. ECMWF is the most precise global model. ECMWF performs way better than the GFS.

Medium Range Forecasting: This kind of forecasting lasts 3-4 days to 2 weeks. Medium-term forecasts are made for small strategic resolutions in correlation with the nature of the business. They are very important in the area of business budgeting and development and it is from this forecast that company budgets are decided. inaccurate forecasting can have serious impacts on the rest of the organization, the organization will be forced to be with the unsold stock and will have to overspend on production again. A huge amount of money has to be paid to banks and creditors, and stock may have to be sold at a very less price. Organizations can go bankrupt due to insufficient attention on medium-term sales forecasting. The time period for a medium-term forecast is usually one year.

Long-Range Forecasts: This forecasting is for times longer than four weeks. Long-term forecasts are for mainly major upcoming strategic decisions to be taken within an organization and for the organization, They focus very much on how to use resources in an optimum manner. They deal with basic items rather than specific items. And therefore, organizations are concerned more with general ongoing trends, following these trends, regular attempts to predict revenue-generating sales over periods greater than two years. In some strategies, For huge industries, accurate predictions might be needed for a decade or more to tackle the changes. The disadvantage of such forecasts is that they cannot be more than unclear. Prediction planners blame the forecast when things go wrong totally opposite what was predicted and forecasting hence receives criticism from all who are impacted

4.4 Output Screens:

bijnor   Search

| Friday | Apr29 | 10:24AM |

Bijnor, IN

33.13^{0}C ☁

created with ♥ by Team Members

Welcome to weather app

We Are Developers, Students, And Travellers

ABOUT ME

SOFTWARE TESTING

Testing is one of the most important phases in the software development activity. In the software development lifecycle (SDLC), the main aim of the testing process is the quality: the developed software is tested against attaining the required functionality and performance.

During the testing process the software is worked with some particular test cases and the output of the test cases are analyzed whether the software is working according to the expectations or not.

5.1 Introduction

The success of the testing process is determining the errors which mostly depend upon the test case criteria, for testing any software we need to have a description of the expected behavior of the system and method of determining whether the observed behaviour confirmed to the expected behaviour.

Level of Testing:

Since the errors in the software can be injured at any stage. So, we have to carry out the testing process at a different level during the development. The basic levels of testing are Unit Integration, System Testing and Acceptance Testing.

The Unit Testing is carried out on coding. Here different modules are tested against the specifications produced during design for the modules. In case of Integration Testing different tested modules are combined into sub systems and tested. In case of the system testing the full software is tested and in the next level of testing the system is tested with user requirement document prepared during SRS.

There are two basic approaches for testing. They are

Functional Testing:

In functional testing test cases are decided solely on the basis of requirements of the program or the module and the internals of the program or modules are not considered for selection of test cases. This is also called Black Box Testing.

Structural Testing:

In Structural Testing test cases are generated on actual code of the program or module to be tested. This is called White Testing.

5.2 Testing Process

A number of activities must be performed for testing software. Testing starts with test plan. Test plan identifies all testing related activities that need to be performed along with the schedule and guidelines for testing. The plan also specifies the levels of testing that need to be done, by identifying the different testing units. For each unit specified in the plan first the test cases and reports are produced. These reports are analyzed.

Test plan:

Test plan is a general document for the entire project, which defines the scope, approach to be taken and the personal responsibility for different activities of testing. The inputs for forming test plans are:

Project plan

Requirements documents

System design

Test Case Specification:

Although there is one test plan for the entire project, test cases have to be specified separately for each test case. Test case specification gives for each item to be tested. All test cases and outputs expected for those test cases.

Test Case Execution and Analysis:

The steps to be performed for executing the test cases are specified in separate document called test procedure specification. This document specifies any specify requirements that exist for setting the test environment and describes the methods and formats for reporting the results of testing.

Unit Testing:

Unit testing mainly focused first in the smallest and low-level modules, proceeding one at a time. Bottom-up testing was performed on each module. As developing a driver program, that tests modules by developed or used. But for the purpose of testing, modules themselves were used as stubs, to print verification of the actions performed. After the lower-level modules were tested, the modules that in the next higher level those make use of the lower modules were tested.

Each module was tested against required functionally and test cases were developed to test the boundary values.18

Integration Testing:

Integration testing is a systematic technique for constructing the program structure, while at the same time conducting tests to uncover errors associated with interfacing. As the system consists of the number of modules the interfaces to be tested were between the edges of the two modules. The software tested under this was an incremental bottom-up approach.

Bottom-up approach integration strategy was implemented with the following steps.

- Low level modules were combined into clusters that perform specific software sub fractions.
- The clusters were then tested.

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CHAPTER-6

CONCLUSION

 The weather forecast you mention in your report must be for three or seven days. Do not forecast the weather conditions for months because long-term forecasts are less accurate, therefore, less reliable. The forecast can be made by studying the satellite map or taking the help of meteorologists.

When writing a weather forecast, you need to state the general weather conditions such as sunny, cloudy, rainy, stormy, cloudy, low and high temperature, and weather warnings like tornadoes, flooding, etc.

I hope the above examples gave you a good idea of the weather report. Also, read the following article.

- **www.w3schools.com**
- **https://www.geeksforgeeks.org**
- **https://www.tutorialspoint.com**

- **www.quora.com**
- **https://www.slideshare.net**
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