ASSIGNMENT 2

PENSION and COMMUTATION CALCULATOR

Submitted in partial fulfillment of the requirements for the award of degree of

BTech Computer Science Engineering

Submitted to
Dr Dhanpratap Singh

SUBMITTED BY

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31 OCTOBER, 2020

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Student Declaration

To whom so ever it may concern

This is to declare that this report has been written by Raja Krishnarjun Shukla, Mritunjay Jha , Divyansh Bawankar . No part of the report is copied from other sources. All information included from other sources have been duly acknowledged. I/We ever that if any part of the report is found to be copied, I/we are shall take full responsibility for it.

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Divyansh Bawankar (11909765) B57

Signature of the student

Dated: 31 October ,2020

BONAFIDE CERTIFICATE

Certified that this project report "**PENSION and COMMUTATION CALCULATOR**" is the bonafide work of "Raja Krishnarjun Shukla , Mritunjay Jha , Divyansh Bawankar " who carried out the project work under my supervision.

Dr Dhanpratap Singh

<<Academic Designation>>

<<ID of Supervisor>>

<<Department Supervisor>>

INTRODUCTION OF THE PROJECT

➢ Objectives and Motivation:

We are given this project to make a Pension and Commutation Calculator with the help of python language . The objective of this project is to provide a working pension calculator for the banks and other government sectors. This calculator helps you work out what income you're likely to get from super and the age pension when you retire how contributions, investment options, fees and retirement age affect your retirement income how working part-time or taking a break from work affects your super balance . It provides you with the amount of money which you are entitled to in the future. The pension amount is an investment and not a liability. Besides, 40% worth of the total sum must be invested in annuities. Furthermore, the remaining 60% is subjected to taxation too. The calculator never errs. If you have ever tried to manually calculate the pension amounts, you will understand how tough it is.

The default assumptions in this Pension calculator are based on Treasury's long-term retirement income models. We made this calculator with the help of some govt website for taking help like current rate, interest rate , and there formula for calculating pension. For more information on Treasury's long-term retirement income modelling assumptions visit to govt website.

➢ Outcome and Background of the project:

With the help of this calculator, different Banks and government sectors will get help for calculating pensions for their employs. The outcome of the project is that student acquires python skills and tools used to solve problems. In particular, the student should be able to: understand algorithms behind most used in making calculator. Problems and solutions using Python language. The calculator will be capable of calculating the total amount and monthly payment based on period an interest rate.

This calculator helps you work out what income you're likely to get from super and the age pension when you retire how contributions, investment options, fees and retirement age affect your retirement income how working part-time or taking a break from work affects your super balance.

Description of Project:

Project is based on Python programming language. We used different types of liberies in python to develop this project . we used Tkinter libarery which is Python's de-facto standard GUI (Graphical User Interface) package. It is a thin object-oriented layer on top of Tcl/Tk. Tkinter is not the only Gui Programming toolkit for Python. It is however the most commonly used one. provides us with a variety of common GUI elements which we can use to build our interface – such as buttons, menus and various kinds of entry fields and display areas. We call these elements widgets. We are going to construct a tree of widgets for our GUI – each widget will have a parent widget, all the way up to the root window of our application. For example, a button or a text field needs to be inside some kind of containing window ,

This project is to provide a working pension calculator for the banks and other government sectors. This calculator helps you work out what income you're likely to get from super and the age pension when you retire how contributions, investment options, fees and retirement age affect your retirement income how working part-time or taking a break from work affects your super balance . It provides you with the amount of money which you are entitled to in the future. The pension amount is an investment and not a liability. With the help of this calculator, different Banks and government sectors will get help for calculating pensions for their employs

. The outcome of the project is that student acquires python skills and tools used to solve problems. In particular, the student should be able to: understand algorithms behind most used in making calculator. Problems and solutions using Python language.

Description of Work Division in terms of Roles

So in work division we divide complete project in 3 Parts . It is very big project so for convenient of work we divided it in part . coding part , data finding \ information gathering logic and formula.

Coding Part :

Coding part is done by Mritunjay Jha . He perform more than half of the coding in the project . He is good is technical knowledge and done his task very frequently .He is also familiar with visual studio and in anaconda software for performing various task in python language. He used some open source information for development the project like for downloading some python libraries .

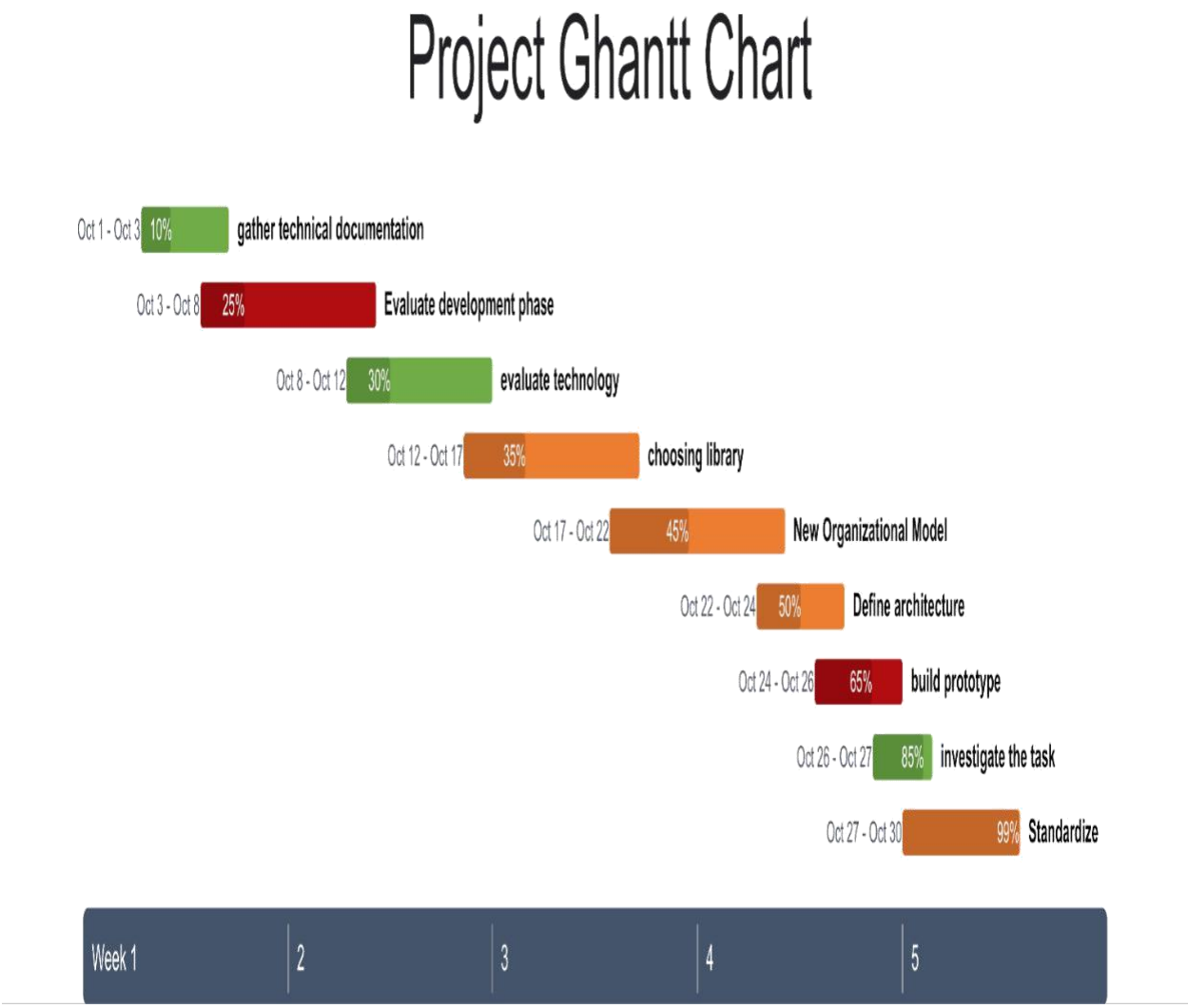
Information gathering :

Information gathering and all the data finding for the project is done by Raja Krishnarjun Shukla. He also made project report and also perform some graphical work in the project. Except coding all other graphic work is done by him. He takes some reference for making project report like data from government website which is needed for the project. He is also familiar with visual studio and anadonda software.

Logic and formula part :

All the logic and formula part is done by Divyansh Bawankar . He perform rest of the coding part and also make some changes in project. He is also familiar with python language and visual studio and with anaconda software . He also work in finding different updates about Pension system of India and calculation of pension system and various formula used in this project.

Implementation of scheduled work of Project



```
----------------------CALCULATED PENSION AND COMMUTATION IS-----------------------



BASIC PENSION : 70958
_____________________________________________________________________________
COMMUTATION AMOUNT : 21287
_____________________________________________________________________________
REDUCED BASIC PENSION : 49671
_____________________________________________________________________________
COMMUTATION FACTOR : 17.29
_____________________________________________________________________________
COMMUTATION VALUE : 4416721


*****************************************************************************
*****************************************************************************
```

```
*****************************************************************************
              **PENSION AND COMMUTATION CALCULATOR-PSU BANKS**
-----------------WELCOME TO PENSION AND COMMUTATION
CALCULATOR----------------------

Enter Basic Pay :120000
_____________________________________________________________________________

Enter special Pay :9865
_____________________________________________________________________________

Enter Stagnation Pay :8694
_____________________________________________________________________________

Enter Qualification Pay :5689
_____________________________________________________________________________

Enter Fixed Personal Pay (Portion Eligibe for PF Deduction ) :5963
_____________________________________________________________________________

Enter Other Pay (portion Eligible For PF Deduction) :5897
_____________________________________________________________________________

Enter Years of Service (Maximum 33 Years) :30
_____________________________________________________________________________

Enter Age At Next Birthday :33
_____________________________________________________________________________

Enter Commutation Percentage (MAX= 33.3333%) :30
```

Technologies and Framework to be used

Python language :

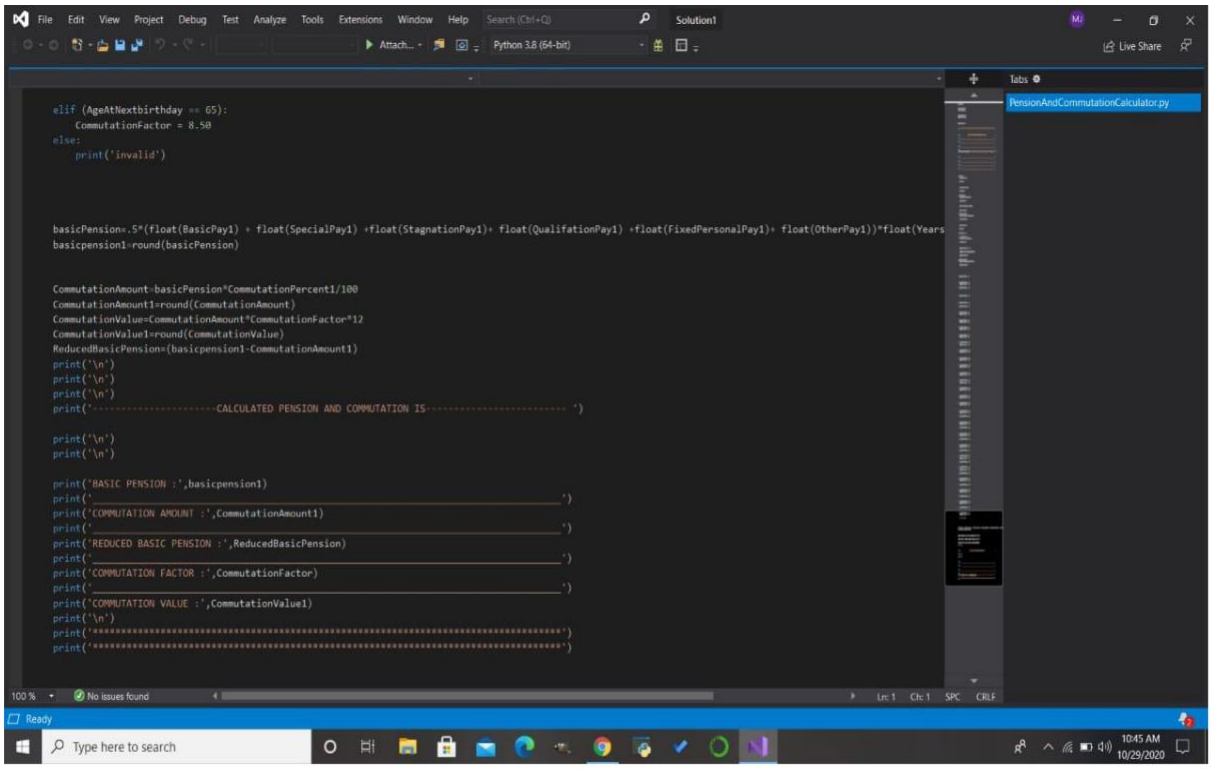
- Python is a widely used general-purpose, high level programming language. It was created by Guido van Rossum in 1991 and further developed by the Python Software Foundation. It was designed with an emphasis on code readability, and its syntax allows programmers to express their concepts in fewer lines of code.
- Python is a programming language that lets you work quickly and integrate systems more efficiently.
- Python offers multiple options for developing GUI (Graphical User Interface). Out of all the GUI methods, tkinter is most commonly used method. It is a standard Python interface to the Tk GUI toolkit shipped with Python. Python with tkinter outputs the fastest and easiest way to create the GUI applications. Creating a GUI using tkinter is an easy task.

To create a tkinter :

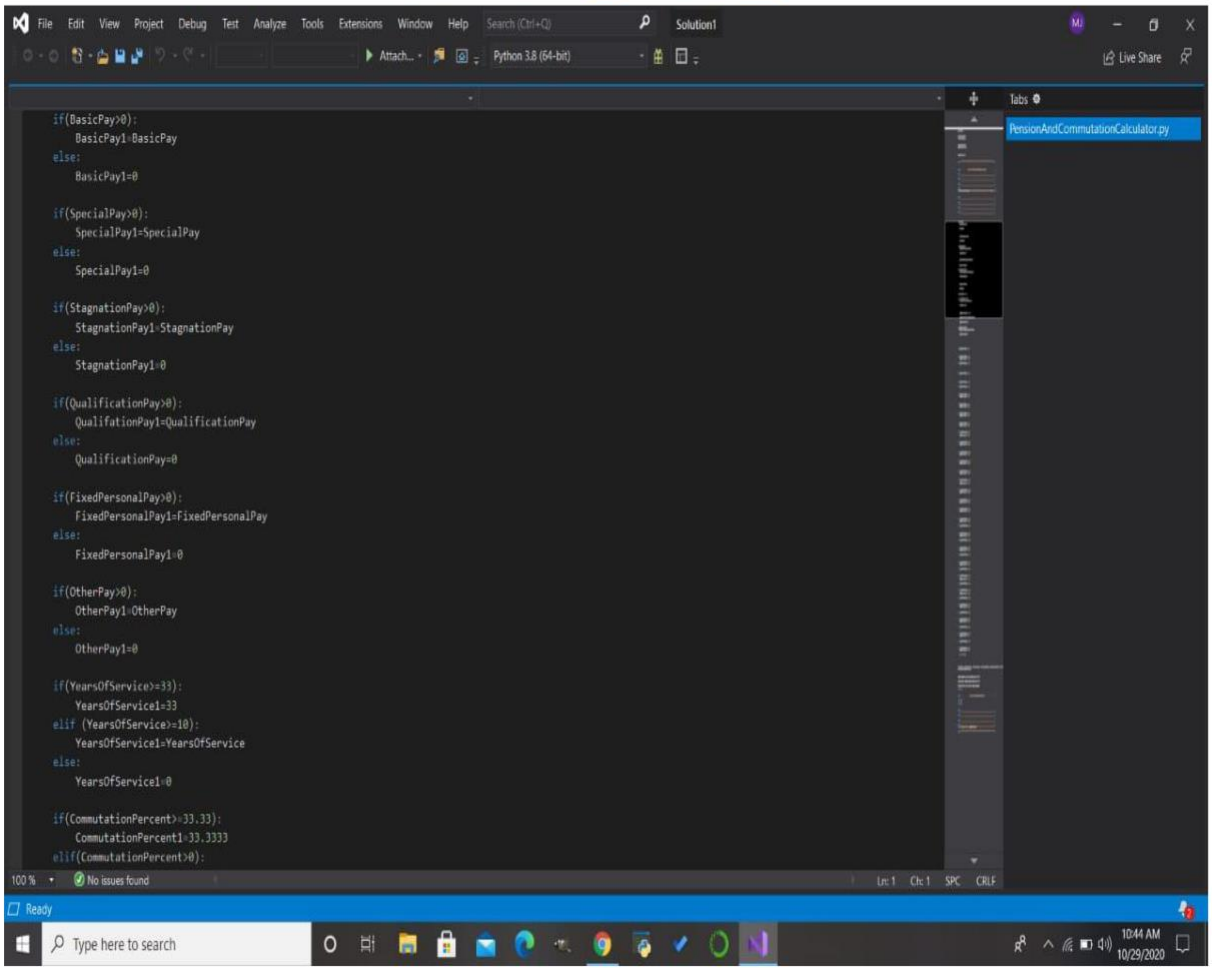
- Importing the module – tkinter
- Create the main window (container)
- Add any number of widgets to the main window
- Apply the event Trigger on the widgets.

Let’s see how to create a loan calculator using Python GUI library Tkiner. The calculator will be capable of calculating the total amount and monthly payment based on loan amount, period an interest rate.

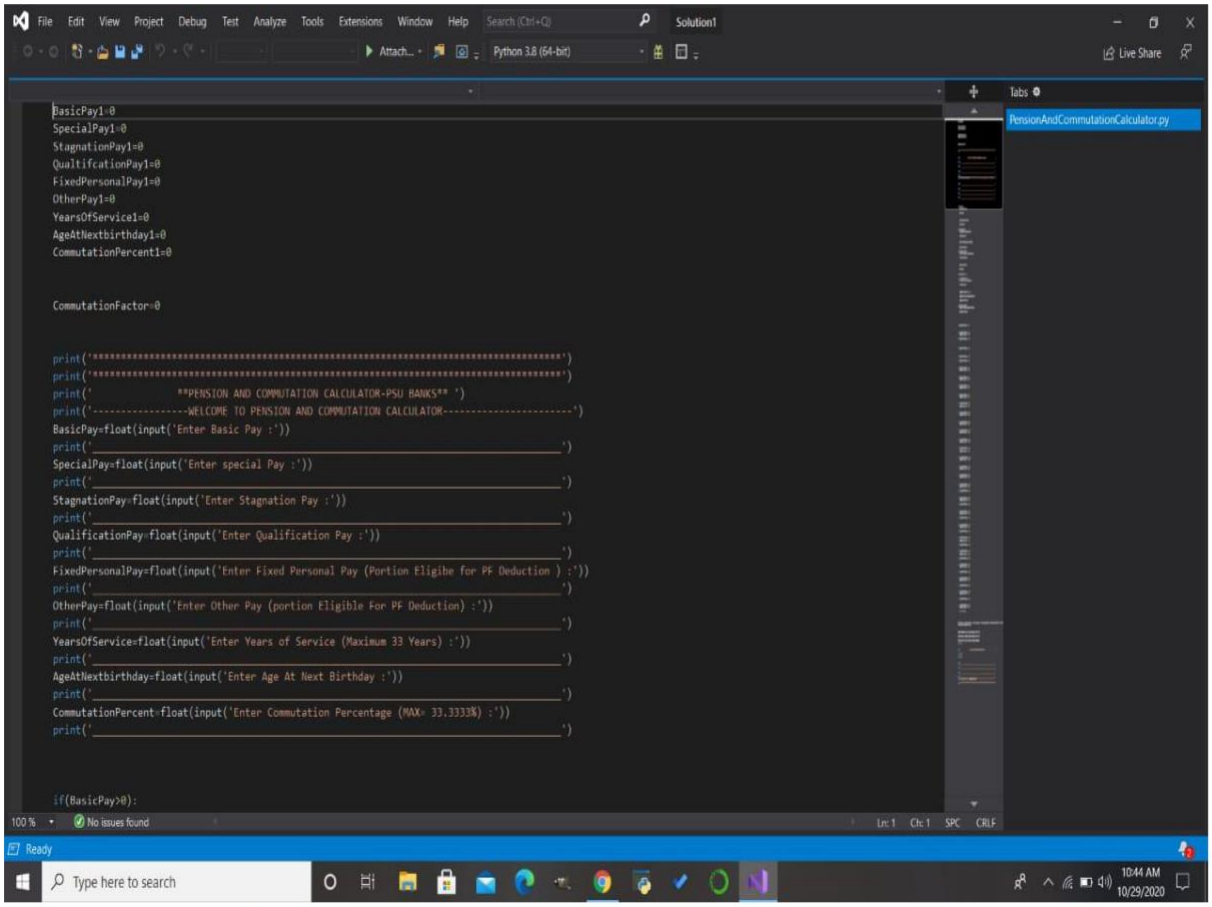
So here we attaches Screenshots of coding for better understanding:



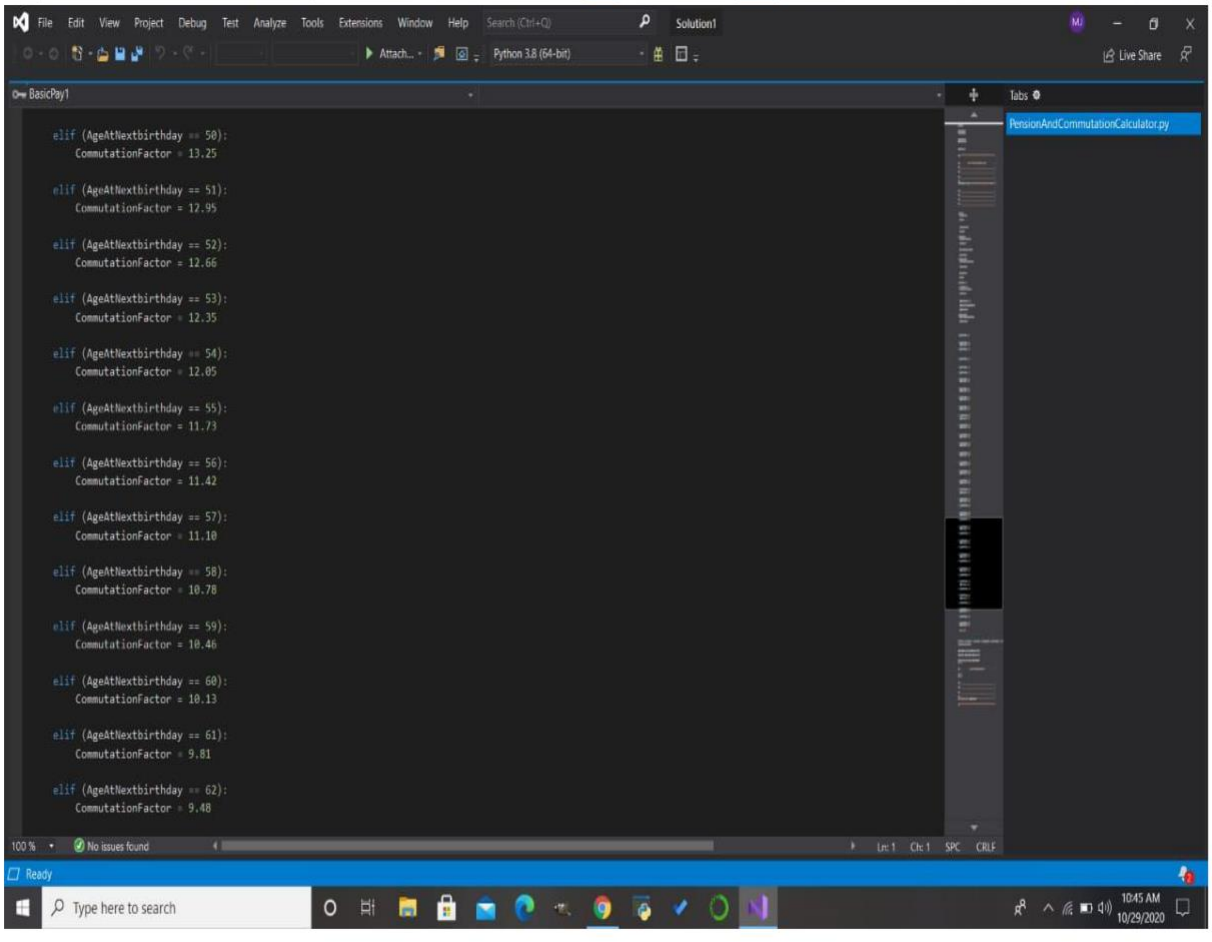
```
    elif (AgeAtNextbirthday == 65):
        CommutationFactor = 8.50
    else:
        print('invalid')



basicPension=.5*(float(BasicPay1) + float(SpecialPay1) +float(StagnationPay1)+ float(QualifationPay1) +float(FixedPersonalPay1)+ float(OtherPay1))*float(Years
basicpension1=round(basicPension)


CommutationAmount=basicPension*CommutationPercent1/100
CommutationAmount1=round(CommutationAmount)
CommutationValue=CommutationAmount*CommutationFactor*12
CommutationValue1=round(CommutationValue)
ReducedBasicPension=(basicpension1-CommutationAmount1)
print('\n')
print('\n')
print('\n')
print('----------------------CALCULATED PENSION AND COMMUTATION IS---------------------- ')

print('\n')
print('\n')

print('BASIC PENSION :',basicpension1)
print('_____________________________________________________________________ ')
print('COMMUTATION AMOUNT :',CommutationAmount1)
print('_____________________________________________________________________ ')
print('REDUCED BASIC PENSION :',ReducedBasicPension)
print('_____________________________________________________________________ ')
print('COMMUTATION FACTOR :',CommutationFactor)
print('_____________________________________________________________________ ')
print('COMMUTATION VALUE :',CommutationValue1)
print('\n')
print('**********************************************************************')
print('**********************************************************************')
```



```
    if(BasicPay>0):
        BasicPay1=BasicPay
    else:
        BasicPay1=0

    if(SpecialPay>0):
        SpecialPay1=SpecialPay
    else:
        SpecialPay1=0

    if(StagnationPay>0):
        StagnationPay1=StagnationPay
    else:
        StagnationPay1=0

    if(QualificationPay>0):
        QualifationPay1=QualificationPay
    else:
        QualificationPay=0

    if(FixedPersonalPay>0):
        FixedPersonalPay1=FixedPersonalPay
    else:
        FixedPersonalPay1=0

    if(OtherPay>0):
        OtherPay1=OtherPay
    else:
        OtherPay1=0

    if(YearsOfService>=33):
        YearsOfService1=33
    elif (YearsOfService>=10):
        YearsOfService1=YearsOfService
    else:
        YearsOfService1=0

    if(CommutationPercent>=33.33):
        CommutationPercent1=33.3333
    elif(CommutationPercent>0):
```



```
BasicPay1=0
SpecialPay1=0
StagnationPay1=0
QualtifcationPay1=0
FixedPersonalPay1=0
OtherPay1=0
YearsOfService1=0
AgeAtNextbirthday1=0
CommutationPercent1=0


CommutationFactor=0


print('*************************************************************************')
print('*************************************************************************')
print('              **PENSION AND COMMUTATION CALCULATOR-PSU BANKS** ')
print('----------------WELCOME TO PENSION AND COMMUTATION CALCULATOR----------------------')
BasicPay=float(input('Enter Basic Pay :'))
print('_____________________________________________________________________')
SpecialPay=float(input('Enter special Pay :'))
print('_____________________________________________________________________')
StagnationPay=float(input('Enter Stagnation Pay :'))
print('_____________________________________________________________________')
QualificationPay=float(input('Enter Qualification Pay :'))
print('_____________________________________________________________________')
FixedPersonalPay=float(input('Enter Fixed Personal Pay (Portion Eligibe for PF Deduction ) :'))
print('_____________________________________________________________________')
OtherPay=float(input('Enter Other Pay (portion Eligible For PF Deduction) :'))
print('_____________________________________________________________________')
YearsOfService=float(input('Enter Years of Service (Maximum 33 Years) :'))
print('_____________________________________________________________________')
AgeAtNextbirthday=float(input('Enter Age At Next Birthday :'))
print('_____________________________________________________________________')
CommutationPercent=float(input('Enter Commutation Percentage (MAX= 33.3333%) :'))
print('_____________________________________________________________________')



if(BasicPay>0):
```



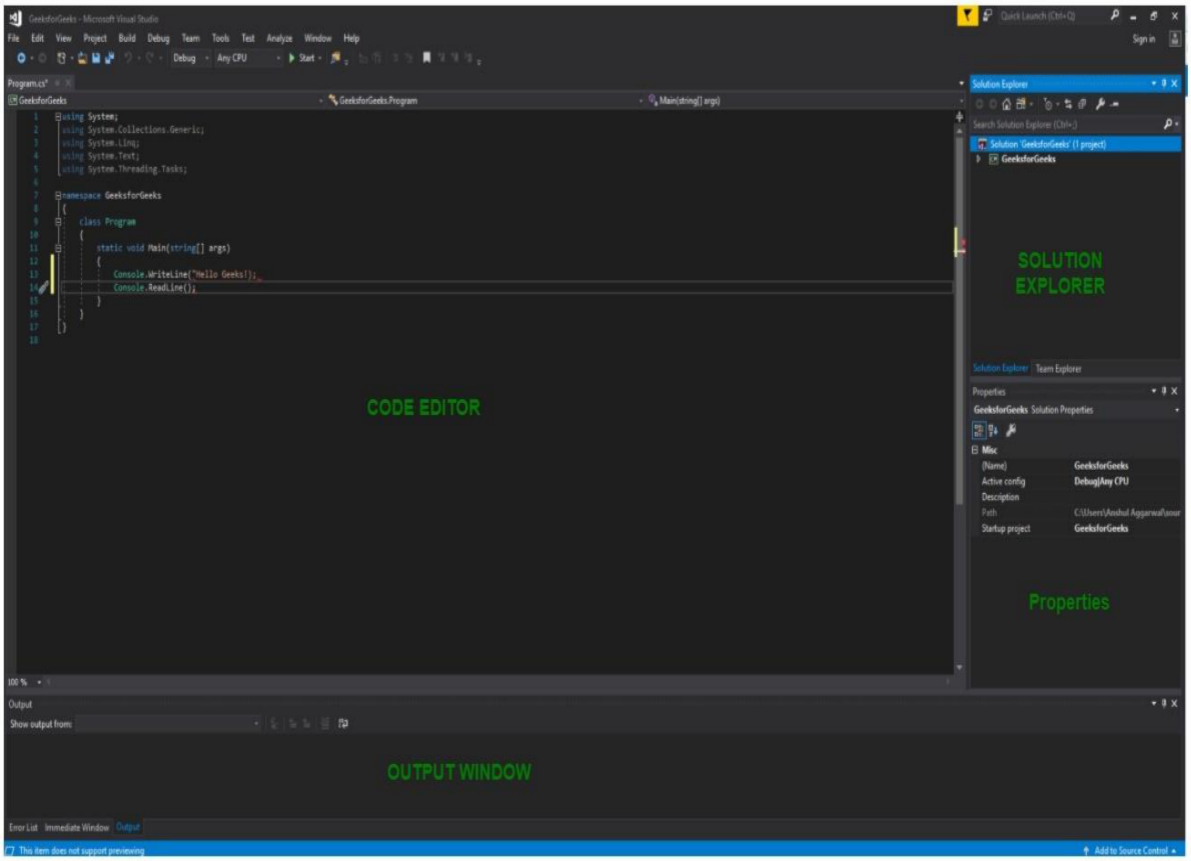
```
    elif (AgeAtNextbirthday == 50):
        CommutationFactor = 13.25

    elif (AgeAtNextbirthday == 51):
        CommutationFactor = 12.95

    elif (AgeAtNextbirthday == 52):
        CommutationFactor = 12.66

    elif (AgeAtNextbirthday == 53):
        CommutationFactor = 12.35

    elif (AgeAtNextbirthday == 54):
        CommutationFactor = 12.05

    elif (AgeAtNextbirthday == 55):
        CommutationFactor = 11.73

    elif (AgeAtNextbirthday == 56):
        CommutationFactor = 11.42

    elif (AgeAtNextbirthday == 57):
        CommutationFactor = 11.10

    elif (AgeAtNextbirthday == 58):
        CommutationFactor = 10.78

    elif (AgeAtNextbirthday == 59):
        CommutationFactor = 10.46

    elif (AgeAtNextbirthday == 60):
        CommutationFactor = 10.13

    elif (AgeAtNextbirthday == 61):
        CommutationFactor = 9.81

    elif (AgeAtNextbirthday == 62):
        CommutationFactor = 9.48
```

Framework used:

We use Visual Studio software building this pension calculator. Python is a popular programming language that is reliable, flexible, easy to learn, free to use on all operating systems, and supported by both a strong developer community and many free libraries. Python supports all manners of development, including web applications, web services, desktop apps, scripting, and scientific computing, and is used by many universities, scientists, casual developers, and professional developers alike.

Visual Studio is a powerful Python IDE on Windows. Visual Studio provides open-source support for the Python language through the **Python Development** and **Data Science** workloads (Visual Studio 2017 and later) and the free Python Tools for Visual Studio extension (Visual Studio 2015 and earlier). Visual Studio's **Python Environments** window (shown below in a wide, expanded view) gives you a single place to manage all of your global Python environments, conda environments, and virtual environments. Visual Studio automatically detects installations of Python in standard locations, and allows you to configure custom installations. With each environment, you can easily manage packages, open an interactive window for that environment, and access environment folders.

Interface of Visual studio :



SWOT Analysis

Strength :

- Coding and debugging is easy because of the simple syntax.
- It is flexible and reusable .
- Further updating and error finding is easy.
- Developers can also use it for scripting websites or other applications.

Weakness :

- It requires rigorous testing as errors show up in runtime.
- Packages for data it has numerous other failings, as well. First, its use of indentation as syntax is highly polarizing.
- Time to time updating and error finding is needed.
- It is slow developers must perform several rounds of testing for any application developed

Opportunity :

- General-purpose programming languages are useful beyond just data analysis.
- Its code readability, speed, and many functionalities.
- For mathematical computation and learning how algorithms work.
- Has high ease of deployment and reproducibility.

Threats :

- Error in making correct calculation.
- Needs regular updation.

- Sometimes performance is slow.

CONCLUSION

It has been a great learning experience, and an opportunity to grown personally and in technically. The learning outcome of this Project are many and this learning are going to support me for my career. we learn different types of python libraries. I work in different types of python platform and understanding the different GUI concepts. We divide our work equally for better understanding and for convenient of work. With the help of this project our working skill is also develop. Our team spirit, better understanding with each other and problem-solving skill develop with the help of the project. We have gone from step by step instructions to defining blocks of code in such a way as to define higher level concepts.

We learned different types of software like Visual studio, Anaconda and that how to work on them. They provide a good Environment for working in python. We learned about loops, conditions, data structures and how to work with them in python.

Reference:

- https://pensionersportal.gov.in/
- http://www.npstrust.org.in/
- https://www.financialexpress.com/
- https://www.geeksforgeeks.org/