

Acknowledgements

COMPUTER UNIVERSITY (MANDALAY)

Computer Science's subjects to improve our Computer science knowledge. As a final year students, we need to write a project for preparation to get our degree Bachelor of Computer Science (B.C.Sc). This project is our effort to submit to our university. We would like to thank the University of Computer Studies, Mandalay.



FINAL YEAR PROJECT REPORT

We would like to thank Dr. Saw Thandar Myint, Associate Professor, Head of Application Department, Computer University (Mandalay), for her kind permission to carry out this project and giving us guidance and workable environment during the period of study.

I especially thank Dr. Saw Thandar Myint, Associate Professor, Head of Application Department, Computer University (Mandalay), for her helpful suggestions.

We are also thankful to Daw Lin Lin Htet, Tutor, English Department, for editing this project from the English language point of view.

ESTIMATION SYSTEM FOR POPULATION OF MYANMAR

and giving which is instruction that we need.

Last of all, we are grateful to our fellow member who work together in this project and we also thank again for the unit.

Bachelor of Computer Science (B.C.Sc)

Presented by Group (18)

2014-2015

Acknowledgements

We are computer Science students, who have been studying several Computer Science's subjects to improve our Computer Science. Being Final year students, we need to write a project for preparation to get the Bachelor of Computer Science (B.C.Sc). This project is our effort to submit to our teacher of the University of computer Studies, Mandalay.

We would like to thank respectfully Dr. Win Aye, Rector of Computer University (Mandalay), for her kind permission to carry out this project, general guidance and workable environment during the period of study.

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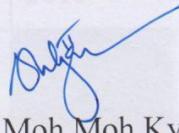
We would like to thank Daw Moh Moh Kyaing, Lecture for supervising and giving which is instruction that we need.

Last of all, we are grateful to our fellow member who work together in this project and we also thank again for the unity.

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Project Schedule

Project Proposal: :March, 2015

First Seminar : :3.6.2015

Second Seminar : :7.7.2015

Third Seminar : :12.8.2015

Book Submission: :28.9.2015

Time Schedule	March 2015	May 2015	June 2015	July 2015	August 2015
Project Proposal					
First Seminar					
Second Seminar					
Third Seminar					
Book Submission					

Project Proposal					
First Seminar					
Second Seminar					
Third Seminar					
Book Submission					

Abstract

Numerical theory is the study of functions that use numerical approximation for the problems of mathematical functions. Numerical theory does not seek exact answers, because answers are often impossible to obtain in practice. In the Numerical theory, there are two types of Lagrange Interpolation. They are Linear Lagrange Interpolation and Quadratic Lagrange Interpolation. This system uses Linear Lagrange Interpolation. This system will estimate between the number of population (two data) by interpolation and it can be calculated f population at a point which is over-rated in the future by using extrapolation. This system is implemented by Java Programming Language.

List of Equation

Equation No	Equation Name	Page
2.1	Lagrange Interpolation	3
2.2	Interpolation	3
2.3	Extrapolation	4

List of Figures

Figure No	Figure Name	Page
3.1	System Flow Diagram	5
3.2	Use Case Diagram	6
Group Member List		
Project Schedule		
Abstract		
List of Equations		
List of Figures		
CHAPTER 1 INTRODUCTION		
1.1	Introduction	1
1.2	Objectives of the Project	1
1.3	Project Requirements	1
1.3.1	Hardware Requirements	1
1.3.2	Software Requirements	1
CHAPTER 2 THEORY BACKGROUND		
2.1	Numerical Theory	2
2.2	Lagrange Interpolation	3
2.2.1	Interpolation	3
2.2.2	Extrapolation	4
CHAPTER 3 DESIGN AND IMPLEMENTATION		
3.1	System Flow Diagram	5
3.2	Use Case Diagram	6

CONTENTS

	PAGE
Acknowledgements	i
Group Member List	ii
Project Schedule	iii
Abstract	iv
List of Equations	v
List of Figures	vi
CHAPTER 1	INTRODUCTION
1.1	Introduction
1.2	Objectives of the Project
1.3	Project Requirements
1.3.1	Hardware Requirements
1.3.2	Software Requirements
CHAPTER 2	THEORY BACKGROUND
2.1	Numerical Theory
2.2	Lagrange Interpolation
2.2.1	Interpolation
2.2.2	Extrapolation
CHAPTER 3	DESIGN AND IMPLEMENTATION
3.1	System Flow Diagram
3.2	Use Case Diagram

3.3	Data Set Tables	7
3.4	Implementation of the Project	9

CHAPTER 4 The CONCLUSION

4.1	Conclusion	23
4.2	Advantages of the Project	23
4.3	Limitations and Further Extension	23

References

female population) and civil and rural population, and household's populations for Mandalay, Yangon, Sagaing, and Ayerwaddy Region.

1.2 Objectives of the Project

- To get fasten the number of population report time.
- To know the Linear-Lagrange Interpolation method for arbitrarily spaced values in year.
- To know interpolation can be constructed by picking different points of interplants.

1.3 Project Requirements

1.3.1 Hardware Requirements

- A computer that has at least P4 compatible processor
- At least 512M memory
- CD disk drive and other peripheral devices

1.3.2 Software Requirements

- Microsoft Office Word 2010 or higher
- Window OS
- Microsoft Access 2007 or higher
- Eclipse, Lint
- Java

CHAPTER 1

INTRODUCTION

1.1 Introduction

The Republic of the Union of Myanmar gathers census for the need of social business for citizens. The census cannot be gathered every year. So, the system can estimate the number of population of that years by the use of interpolation and extrapolation. The system will estimate the number of male and female population and civil and rural population, and household's population for Mandalay, Yangon, Sagaing, and Ayerwaddy Region.

1.2 Objectives of the Project

- To get faster the number of population report time
- To know the Linear Lagrange Interpolation method arbitrarily spaced values in year.
- To know interpolation can be constructed by picking different points of interplants.

1.3 Project Requirements

1.3.1 Hardware Requirements

- A computer that has at least P4 compatible.
- At least 512M memory
- CD disk drive and other peripheral devices

1.3.2 Software Requirements

- Microsoft Office Word 2010 or higher
- Window OS
- Microsoft Access 2007 or higher
- Eclipse, Luna
- jdk 1.7

CHAPTER 2

THEORY BACKGROUND

2.1 Numerical Theory

Numerical theory is the study of algorithms that use numerical approximation (as opposed to general symbolic manipulations) for the problems of mathematical analysis (as distinguished from discrete mathematics).

One of the earliest mathematical writings is a Babylonian tablet from the Yale Babylonian Collection (YBC 7289), which gives a sexagesimalnumerical approximation, the length of the diagonal in a unit square. Being able to compute the sides of a triangle (and hence, being able to compute square roots) is extremely important, for instance, in astronomy, carpentry and construction.

Numerical theory continues this long tradition of practical mathematical calculations. Like the Babylonian approximation, modern numerical analysis does not seek exact answers, because exact answers are often impossible to obtain in practice. Instead, much of numerical analysis is concerned with obtaining approximate solutions while maintaining reasonable bounds on errors.

Numerical theory naturally finds applications in all fields of engineering and the physical sciences, but in the 21st century also the life sciences and even the arts have adopted elements of scientific computations. Ordinarydifferentialequations appear in celestial mechanics (planets, stars and galaxies); numerical linear algebra is important for data analysis; stochastic differential equations and Markov chains are essential in simulating living cells for medicine and biology.

Before the advantage of modern computers numerical methods often depended on hand interpolation in large printed tables. Since the

mid 20th century, computers would calculate the required functions instead. These same interpolation formulas nevertheless continue to be used as part of the software algorithms for solving differential equations

2.2 Lagrange Interpolation

Let's generalize the linear interpolation by denoting the values in the table . Then a linear function interpolating the first two values can be written as

Since every term here is a constant except x , it is easy to see that the polynomial. The linear interpolation can also be written in the form

$$P(x) = f_0 L_0(x) + f_1 L_1(x)$$

Where

$$L_0(x) = \frac{x - x_1}{x_0 - x_1}$$

$$L_1(x) = \frac{x - x_0}{x_1 - x_0}$$

2.2.1 Interpolation

Interpolation solves the following problem: given the value of some unknown function at a number of points, what value does that function have at some other point between the given points?

x=input year;

$x_0, x_1 = \text{year};$

f_0, f_0 =population;

$P(x)$ =estimate population;

$$= x - x_1 / x_0 - x_1 * f_0 + x - x_0 / x_1 - x_0 * f_1$$

2.2.2 Extrapolation

Extrapolation is very similar to interpolation, but now we want to find the value of the unknown function at a point which is outside the given points.

x=input year;

x_0, x_1 = last two year;

f_0, f_0 =population;

$P(x)$ =estimate population;

$$P_1(x) = L_0(x)f_0 + L_1(x)f_1 \dots \quad \dots \quad 2.3$$

$$= x - x_1 / x_0 - x_1 * f_0 + x - x_0 / x_1 - x_0 * f_1$$

CHAPTER 3 DESIGN AND IMPLEMENTATION

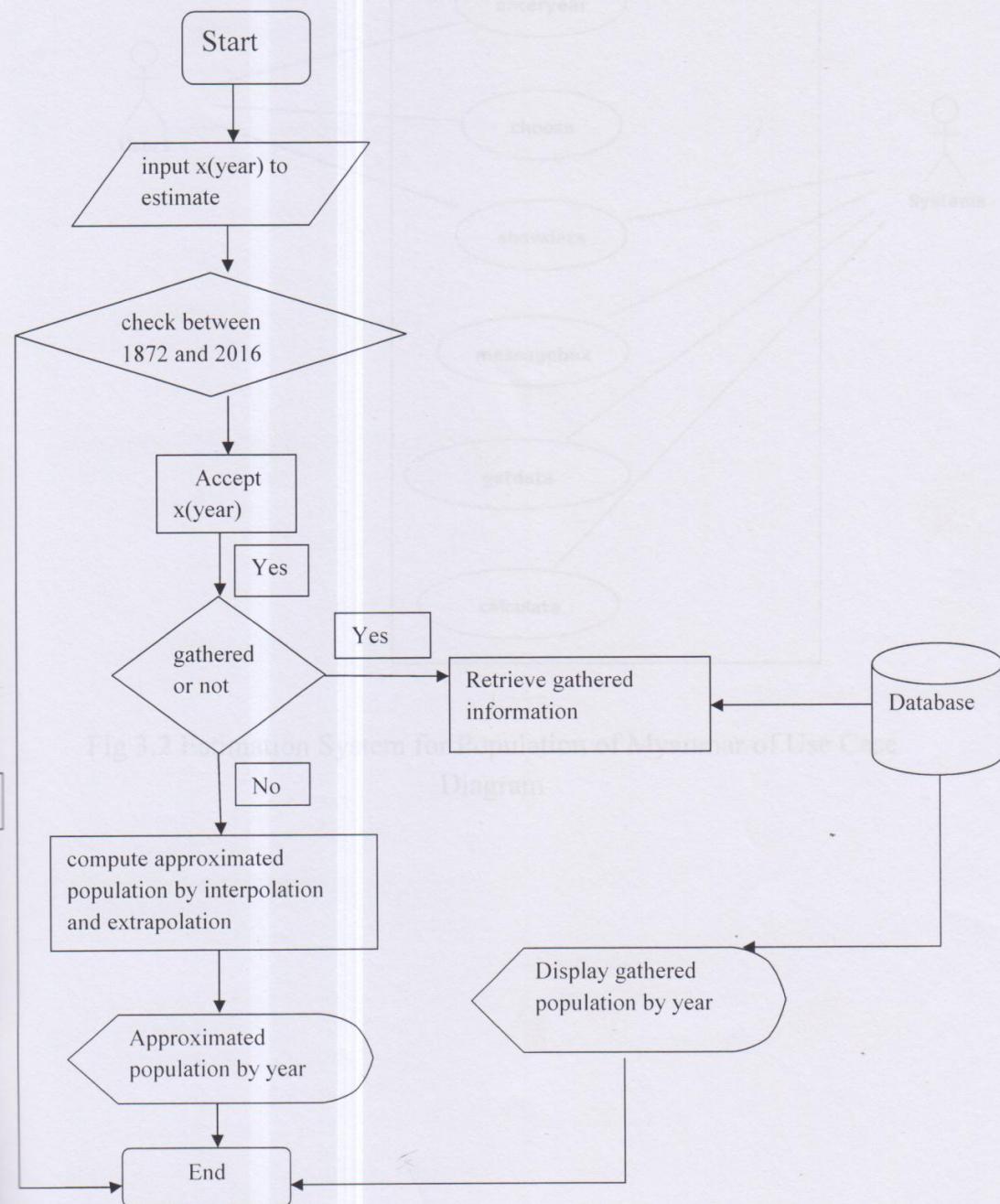


Fig 3.1 Estimation System for Population of Myanmar of System Flow Diagram

3.3 Data Set Tables

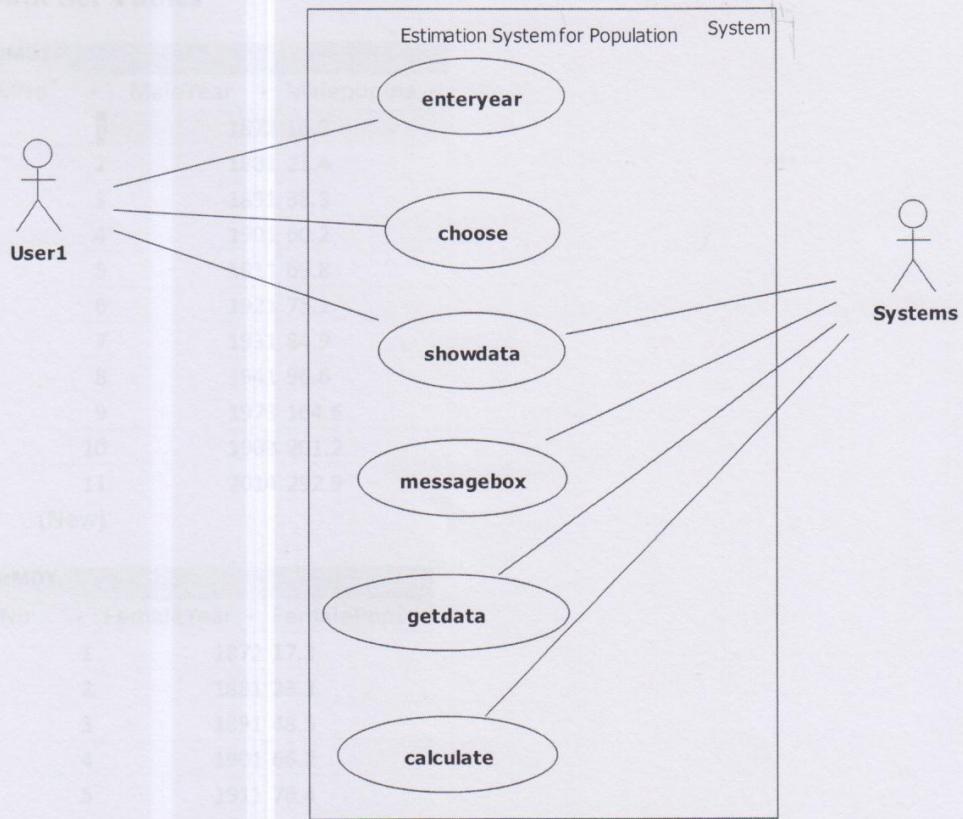


Fig 3.2 Estimation System for Population of Myanmar of Use Case Diagram

3.3 Data Set Tables

MaleMDY			
MMNo	MaleYear	Malepopula	
1	1872	16.2	
2	1881	21.4	
3	1891	38.3	
4	1901	60.2	
5	1911	69.8	
6	1921	75.1	
7	1931	84.9	
8	1941	96.6	
9	1973	164.6	
10	1983	201.2	
11	2014	292.9	
(New)			

FemaleMDY			
MFNo	FemaleYear	FemalePopu	
1	1872	17.3	
2	1881	23.3	
3	1891	48.5	
4	1901	66.2	
5	1911	76.4	
6	1921	83.2	
7	1931	92.6	
8	1941	105.7	
9	1973	181.6	
10	1983	221.5	
11	2014	322.5	

MDY1			
MCNo	CivilYear	Civilpopulat	
1	1872	11.4	
2	1881	15.6	
3	1891	32.2	
4	1901	44.0	
5	1911	50.6	
6	1921	55.2	
7	1931	61.4	
8	1941	70.0	
9	1973	119.8	
10	1983	146.8	
11	2014	213.7	

MDY2		
MRNo	RuralYear	Ruralpopula
1	1872	21.5
2	1881	29
3	1891	60.2
4	1901	82.2
5	1911	94.9
6	1921	103.5
7	1931	115.1
8	1941	131.5
9	1973	225.6
10	1983	323.3
11	2014	400.85

HouseHoldAYA		
AFNo	HouseHoldY	HouseHoldp
1	1872	33.1
2	1881	44.6
3	1891	92.8
4	1901	126.7
5	1911	146.2
6	1921	159.4
7	1931	177.2
8	1941	202.4
9	1973	347.7
10	1983	424.2
11	2014	617.5

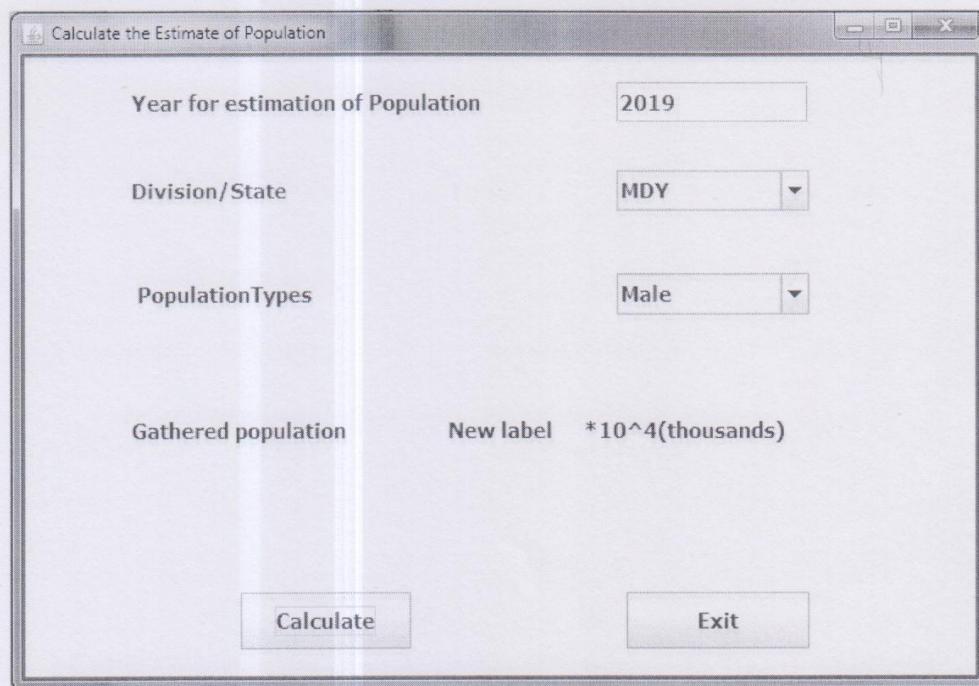


Fig 3.4.7 Calculate the Estimation of Population

The user inserts input year in textbox. Then user clicks "Calculate" button.

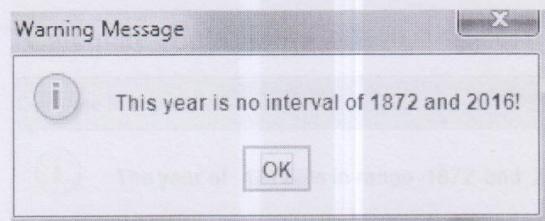


Fig 3.4.8 Warning Message

Input year does not have the interval of 1872 and 2016. So, shows the warning message. Then user clicks "OK" button.

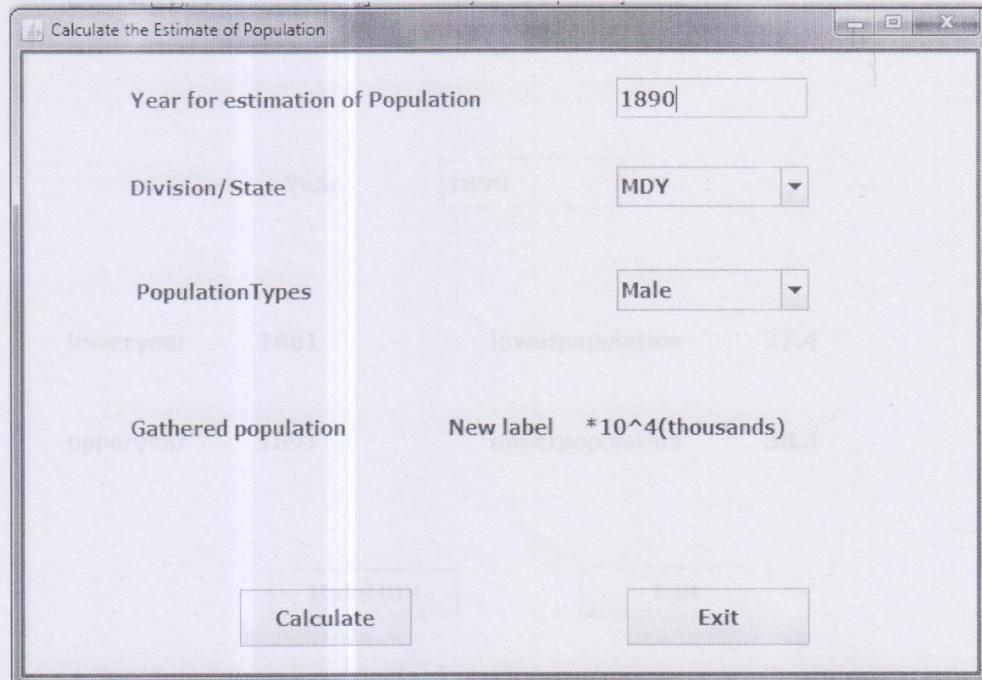


Fig 3.4.9 Calculate the Estimation of Population

The user inserts input year in textbox. And the user chooses "Region/State" and "Population Type" from Combo box. Then user clicks "Calculate" button.

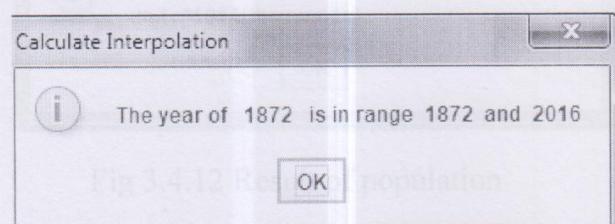


Fig 3.4.10 The year range message box

If input year has the interval of 1872 and 2016, shows the message box. Then user clicks "OK" button.

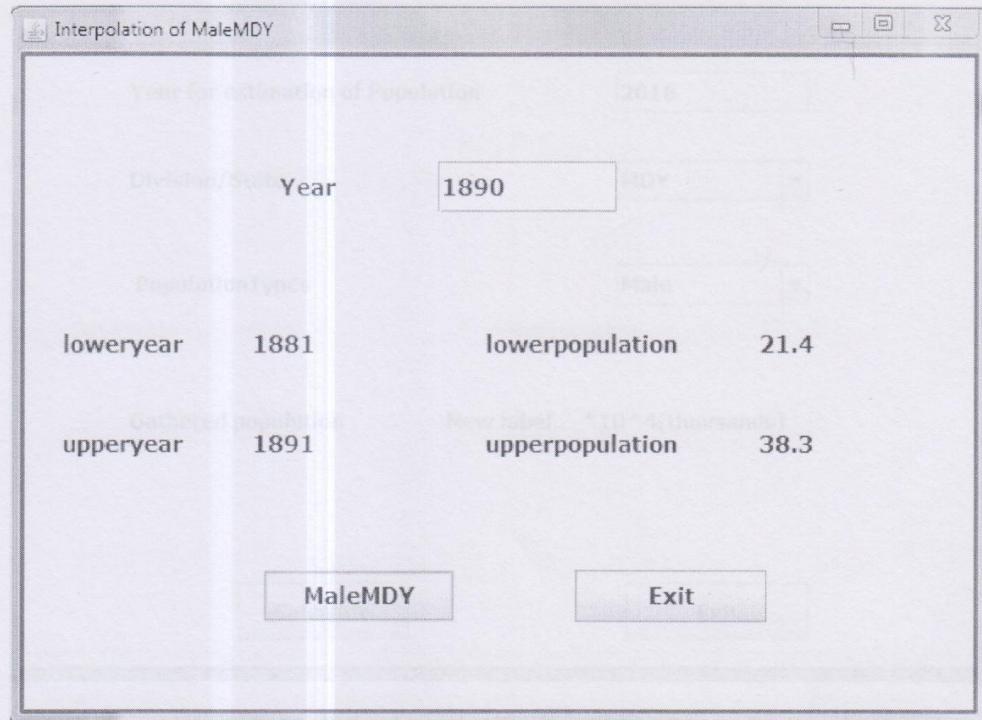


Fig 3.4.11 Interpolation

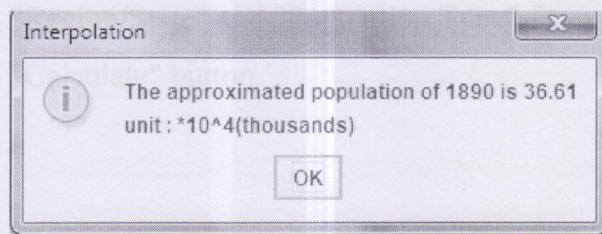


Fig 3.4.12 Result of population

When the user clicks "MaleMDY" button, shows the result of the approximated population.

Calculate the Estimate of Population

Year for estimation of Population	<input type="text" value="2016"/>
Division/State	<input type="text" value="MDY"/>
PopulationTypes	<input type="text" value="Male"/>
Gathered population	New label *10^4(thousands)
<input type="button" value="Calculate"/> <input type="button" value="Exit"/>	

Fig 3.4.13 Calculate the Estimation of Population

The user inserts the input year in textbox. And the user chooses "Region/State" and "Population Type" from ComboBox. Then user clicks "Calculate" button.

Fig 3.4.15 Result of population

Then shows the "Extrapolation" form for the calculation. When the user clicks "MaleMDY" button, shows the result of the approximated population.

Extrapolation of MaleMDY

ESTIMATION SYSTEM FOR POPULATION OF MYANMAR			
Year	2016		
upperyear	2014	upperpopulation	292.9
loweryear	1983	lowerpopulation	201.2

Supervisor : Dein Phyu Maung Kyawng Lecturer

Estimation **Exit**

Fig 3.4.14 Extrapolation

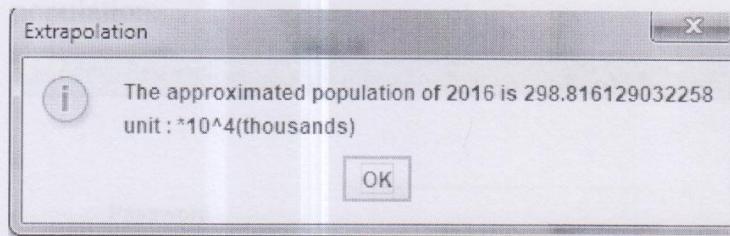


Fig 3.4.15 Result of population

Then shows the "Extrapolation" form for the calculation. When the user clicks "MaleMDY" button, shows the result of the approximated population.

Fig 3.4.16 Admin password

When user clicks "Admin" button, show the admin password form. This form includes "password" input text and "OK" button.

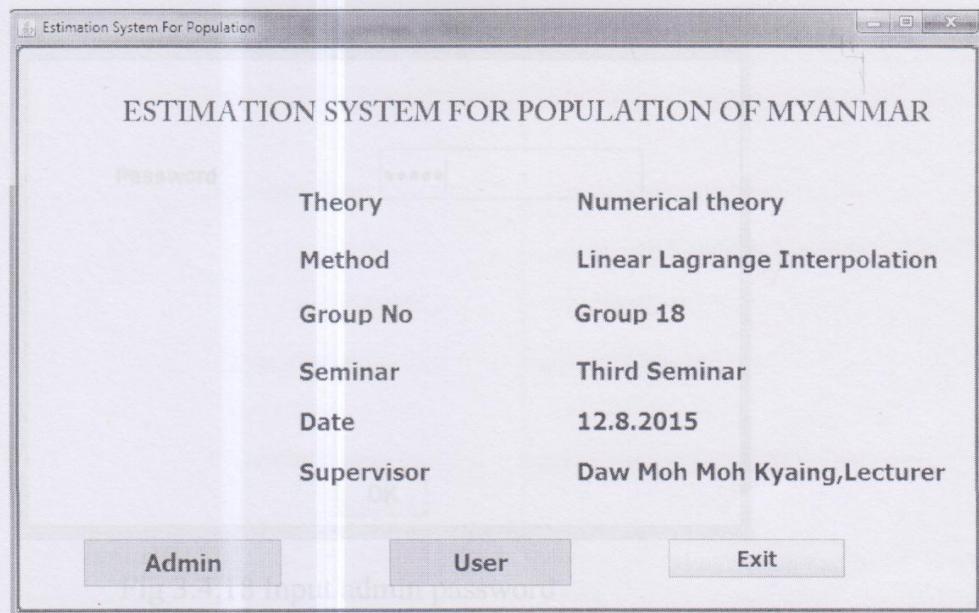


Fig 3.4.16 Main page of the system

When the user clicks "OK" button, show the main page of the system for population.

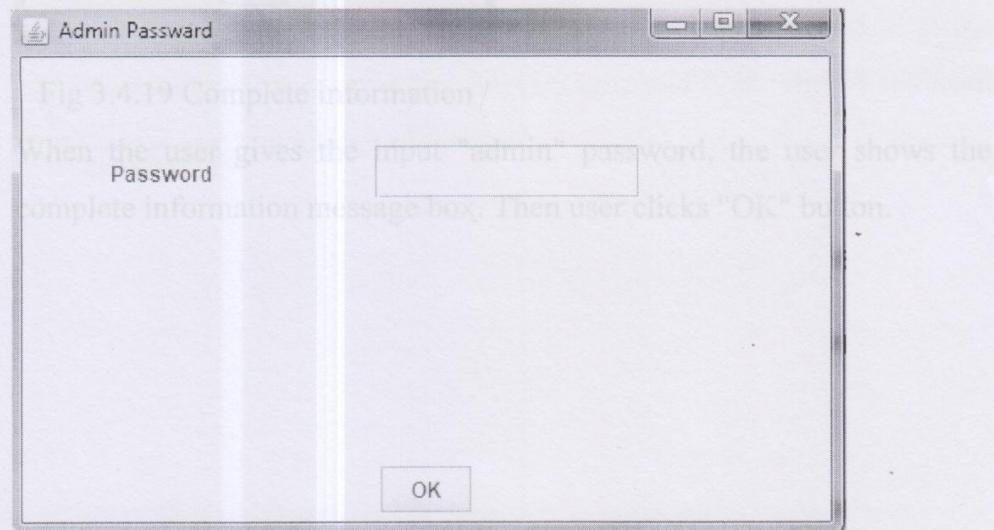


Fig 3.4.17 Admin password

When user clicks "Admin" button, show the admin password form. This form includes "password" input text and "OK" button.

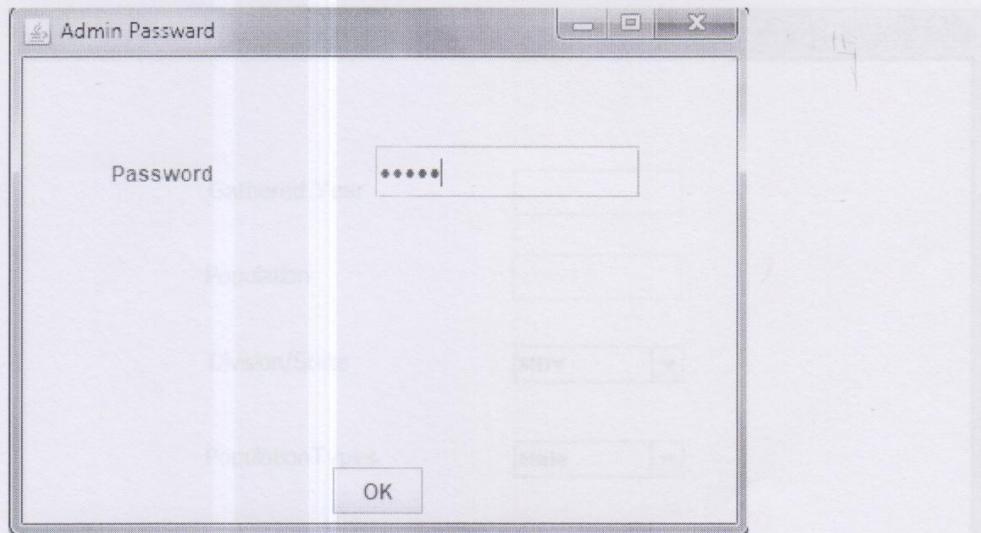


Fig 3.4.18 Input admin password

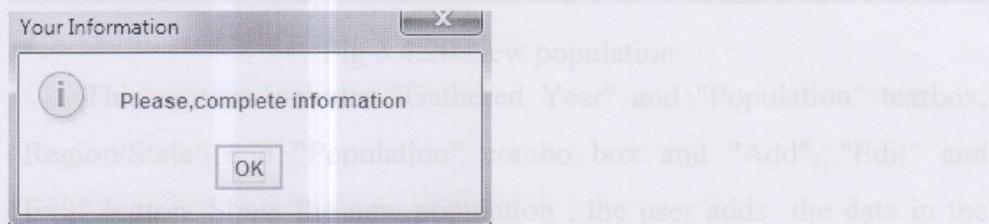


Fig 3.4.19 Complete information

When the user gives the input "admin" password, the user shows the complete information message box. Then user clicks "OK" button.

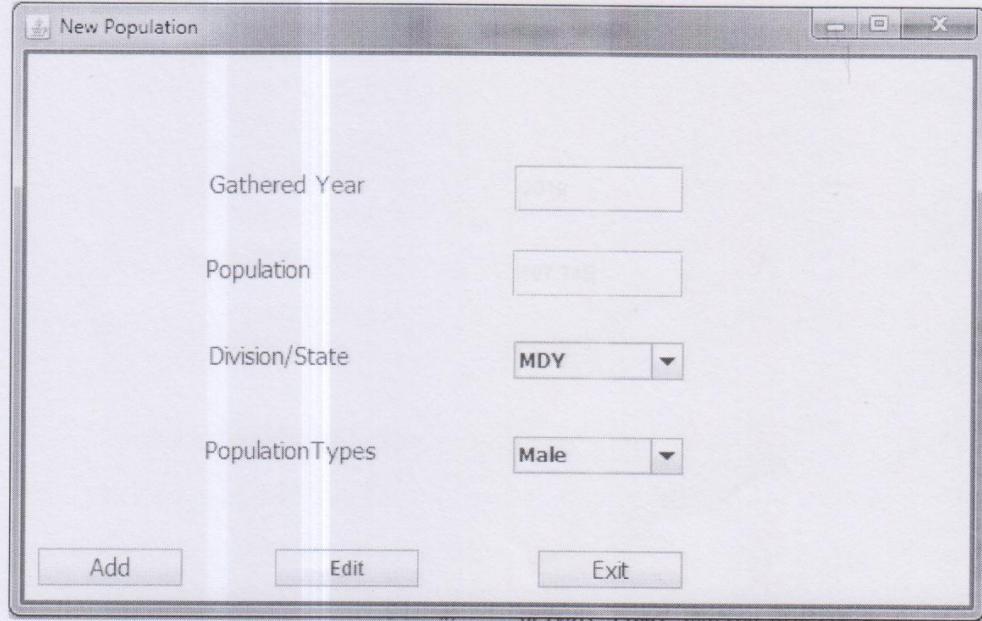


Fig 3.4.20 New population

This system includes "Gathered Year" and "Population" textbox, "Region/State" and "Population" combo box and "Add", "Edit" and "Exit" button. Show the new population , the user adds the data in the text box and the user chooses the Region/State and Population Type from Combo box and then clicks add button.

Fig 3.4.22 New population (for MaleMDY) =

When user clicks "Add" button, shows the new population.

New Population

Gathered Year

Population

Division/State

PopulationTypes

Add Edit Exit

Fig 3.4.21 Input new population

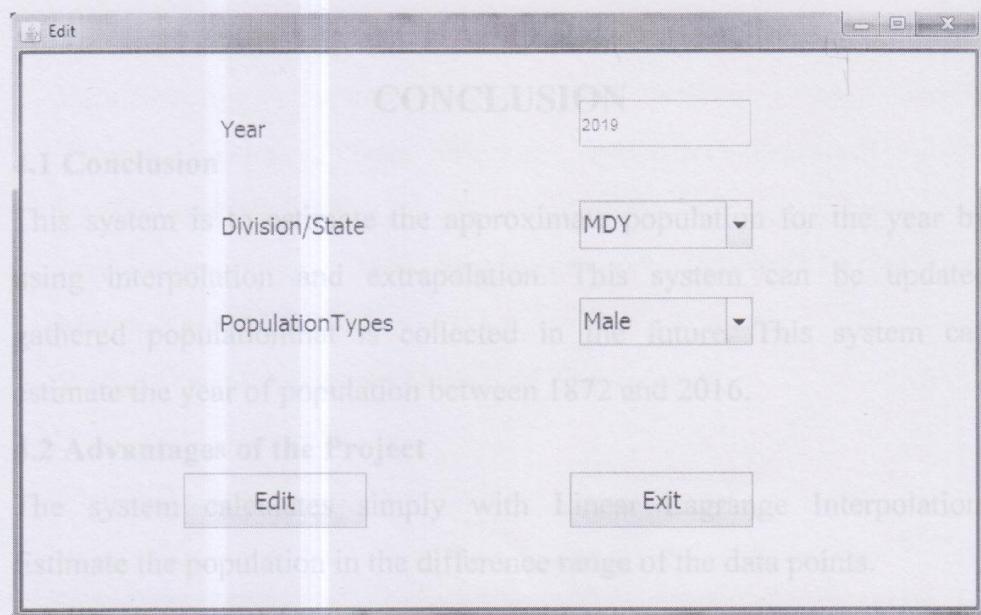
When the user adds the new population, the user inserts input "Gathered Year" and "Population". Example "2019" and "897.345".

MMNo	MaleYear	Malepopulation
1	1872	16.2
2	1881	21.4
3	1891	38.3
4	1901	60.2
5	1911	69.8
6	1921	75.1
7	1931	84.9
8	1941	96.6
9	1973	164.6
10	1983	201.2
11	2014	292.9
12	2019	897.345

New population

Fig 3.4.22 New population(for MaleMDY)

When user clicks "Add" button, shows the new population.



The limitation of the system is to estimate the population to 2014 by interpolation. The user makes the correct the data, the new population can be edited the user inserts the input year in textbox and chooses "Region/State" and "Population Type". Then user clicks the "Edit" button.

MMNo	MaleYear	Malepopulation
1	1872	16.2
2	1881	21.4
3	1891	38.3
4	1901	60.2
5	1911	69.8
6	1921	75.1
7	1931	84.9
8	1941	96.6
9	1973	164.6
10	1983	201.2
11	2014	292.9
*	(New)	

← edit population

Fig 3.4.24 Edit population(for MaleMDY)User shows the edit form.

CHAPTER 4

CONCLUSION

4.1 Conclusion

This system is to estimate the approximate population for the year by using interpolation and extrapolation. This system can be updated gathered population that is collected in the future. This system can estimate the year of population between 1872 and 2016.

4.2 Advantages of the Project

The system calculates simply with Linear Lagrange Interpolation. Estimate the population in the difference range of the data points.

4.3 Limitations and Further Extensions

The limitation of the system is used from 1872 to 2014 by interpolation and the outside of the year is used from 2015 to 2016 by extrapolation. This system could further be estimated by adding all Region/State. Moreover, this system can be estimated by not only the Region/State and but also the distinct and township in each of the Region/State. This system can be estimated the number of population between 1872 and 2016. This can be extended for the next year of 2016.

References

1. Data Structure – Sseymourlipschutz, PhD, Professor of Mathematics, Temple University, “Data Structure”, ISBN-0-17-009140-8, Publish by Pentice Hall, 2009.
2. Java-Programming, "Java for Languages", ISBN-00-19-099130-9, Month-Year (May,2011).
3. Website (www.wikipedia.Numerical Theory.org)

3.4 Implementation of the Project

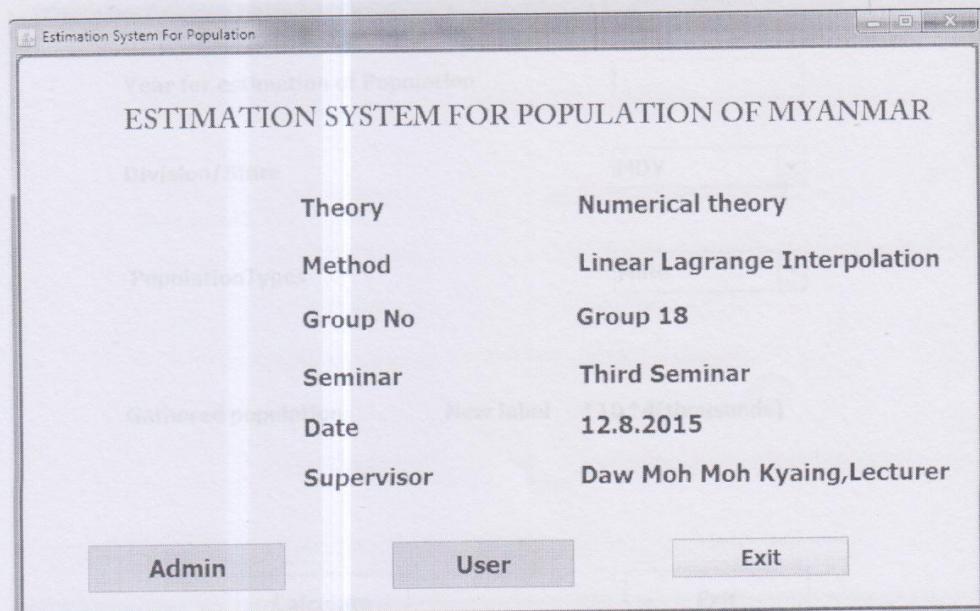


Fig 3.4.1 Main page of the System

Main page includes three buttons "User", "Admin" and "Exit". If the user wants to estimate, they can click the "User" button. And "Admin" button is only for the authorized people.

"Region", "State", "Population", "Year", "Calculator", "Population", "Calculate" button and "Exit" button.

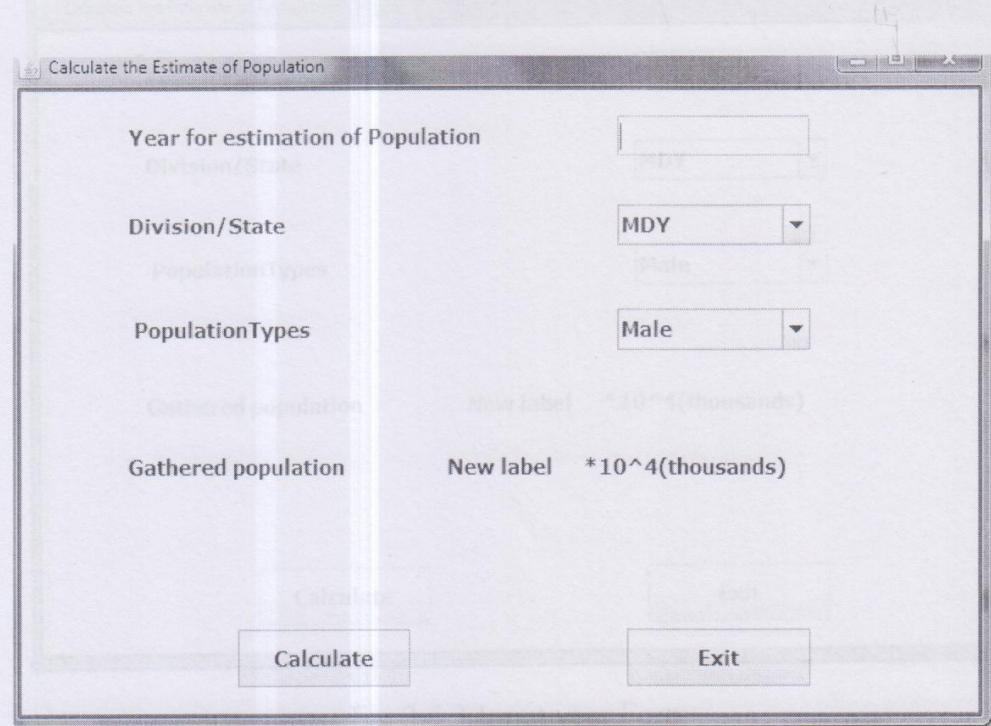


Fig 3.4.2 Calculate the Estimation of Population

When user click "User" button, it will show "calculate the estimation of population" form. This form includes "input year", "Region/State", "Population Type", "Gathered Population", "Calculate" button and "Exit" button.

Fig 3.4.4 The year range

Fig 3.4.5 Gathered Information

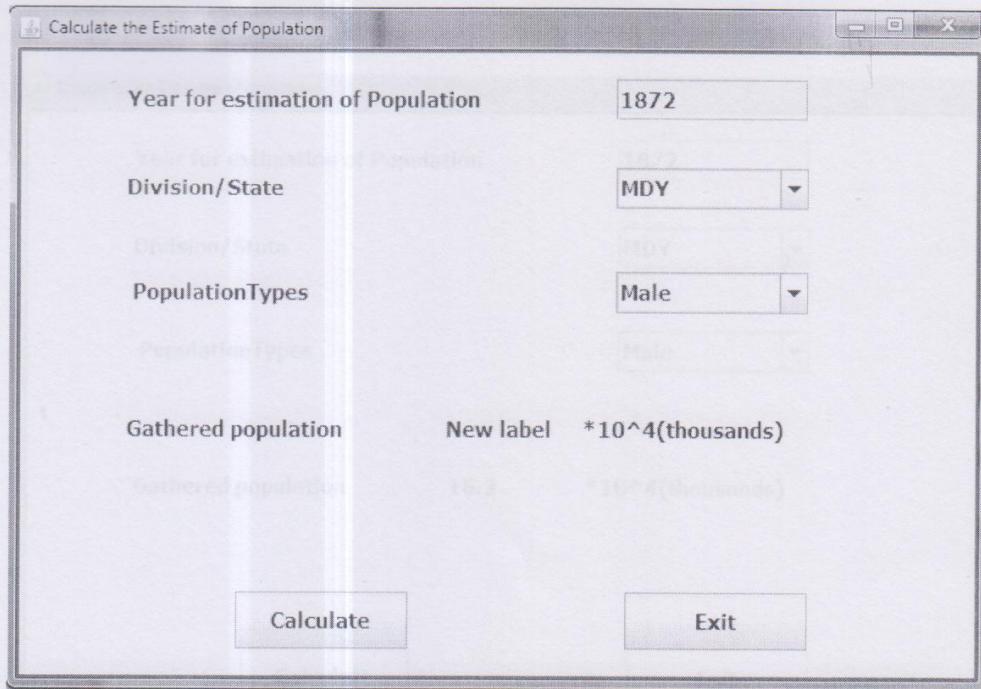


Fig 3.4.3 Input year Form

The user inserts the input year in textbox. Then user clicks "Calculate" button.

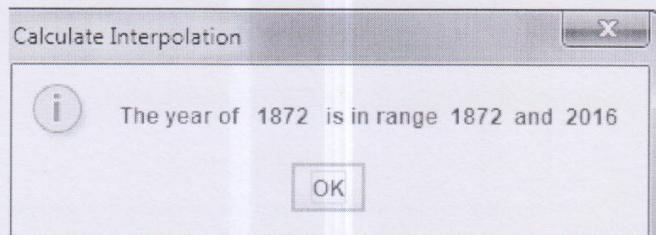


Fig 3.4.4 The year range

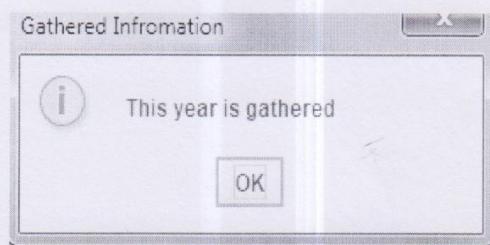


Fig 3.4.5 Gathered Information

Calculate the Estimate of Population

Year for estimation of Population	1872
Division/State	MDY
PopulationTypes	Male
Gathered population	16.2 *10^4(thousands)
<input type="button" value="Calculate"/>	<input type="button" value="Exit"/>

The user has Fig 3.4.6 Gathered Population after clicks "Calculate" button When user clicks "OK" button, show the gathered population.



Fig 3.4.8 Warning Message
Input year does not have the interval of 1872 and 2016. So, shows the warning message.