Innovative teacher's assessments

Teacher's Assessment 1: Critical Review of research papers (5 marks)

Subject: Bioinformatics (IDT451)

Read the research papers. Perform the critical analysis and write (handwritten) the answers to the questions specified with the title of the paper. Create the pdf and submit it on the Google classroom.

Last Date of submission: 11/08/2021

Title of Paper: REVIEW-ARTICLE Bioinformatics: an overview and its applications.

1. Comment on the statement "Systems biology as a multidisciplinary science".
2. What are the application areas of Bioinformatics?
3. Enlist and Explain (Two lines explanation) all the Biological Databases which are specified in this paper.
4. What is mean by Sequence alignment? What is the importance of this in the Bioinformatics? What are the different types of Sequence alignment?
5. Write specific Conclusion for this paper in your own words.

Title of Paper: Genomic mutations and changes in protein secondary structure and solvent accessibility of SARS-CoV-2 (COVID-19 virus).

1. Differentiate between secondary structure and solvent accessibility prediction.
2. What do you mean by ORF? Explain the ORF used in this paper.
3. Which deep learning approach is used to predict protein structure in this paper?
4. Does the Abstract appropriately describe the contents of the paper and its findings? Write a short explanation.
5. How do you think the reported work can be extended further?

Prof. V. Bongirwar, Prof. P. Sonsare
Course Coordinator

GMR

Review

Bioinformatics: an overview and its applications

W.J.S. Diniz[1] and F. Canduri[2]

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ABSTRACT. Technological advancements in recent years have promoted a marked progress in understanding the genetic basis of phenotypes. In line with these advances, genomics has changed the paradigm of biological questions in full genome-wide scale (genome-wide), revealing an explosion of data and opening up many possibilities. On the other hand, the vast amount of information that has been generated points the challenges that must be overcome for storage (Moore's law) and processing of biological information. In this context, bioinformatics and computational biology have sought to overcome such challenges. This review presents an overview of bioinformatics and its use in the analysis of biological data, exploring approaches, emerging methodologies, and tools that can give biological meaning to the data generated.

Key words: Data analysis; Databases; Genomics; Systems biology

scientific reports

Check for updates

OPEN

Genomic mutations and changes in protein secondary structure and solvent accessibility of SARS-CoV-2 (COVID-19 virus)

Thanh Thi Nguyen[1], Pubudu N. Pathirana[2], Thin Nguyen[3], Quoc Viet Hung Nguyen[4], Asim Bhatti[5], Dinh C. Nguyen[2], Dung Tien Nguyen[1], Ngoc Duy Nguyen[5], Douglas Creighton[5] & Mohamed Abdelrazek[1]

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a highly pathogenic virus that has caused the global COVID-19 pandemic. Tracing the evolution and transmission of the virus is crucial to respond to and control the pandemic through appropriate intervention strategies. This paper reports and analyses genomic mutations in the coding regions of SARS-CoV-2 and their probable protein secondary structure and solvent accessibility changes, which are predicted using deep learning models. Prediction results suggest that mutation D614G in the virus spike protein, which has attracted much attention from researchers, is unlikely to make changes in protein secondary structure and relative solvent accessibility. Based on 6324 viral genome sequences, we create a spreadsheet dataset of point mutations that can facilitate the investigation of SARS-CoV-2 in many perspectives, especially in tracing the evolution and worldwide spread of the virus. Our analysis results also show that coding genes E, M, ORF6, ORF7a, ORF7b and ORF10 are most stable, potentially suitable to be targeted for vaccine and drug development.

Biological investigations of the novel coronavirus SARS-CoV-2 are important to understand the virus and help to propose appropriate responses to the pandemic. Scientists have been able to obtain genomic sequences of SARS-CoV-2 and have started analysis of these data. Reference genome of SARS-CoV-2 deposited to the National Center for Biotechnology Information (NCBI) GenBank sequence database (isolate Wuhan-Hu-1, accession number NC_045512) shows that SARS-CoV-2 is an RNA virus having a length of 29,903 nucleotides. Comparative genomic analysis results obtained in[1–3] suggest that the COVID-19 virus may be originated in bats. Other studies show that pangolins may have served as the hosts for the virus[4,5]. Andersen et al.[6] furthermore believe that SARS-CoV-2 is not a purposefully manipulated virus or constructed in a laboratory but has a natural origin. A study in[7] using machine learning unsupervised clustering methods corroborates previous findings that SARS-CoV-2 belongs to the *Sarbecovirus* subgenus of the *Betacoronavirus* genus within the *Coronaviridae* family[8,9]. The whole genome analysis results also indicate that bats are more likely the reservoir hosts for the virus than pangolins. Another study in[10] demonstrates that SARS-CoV-2 may have resulted from a recombination of a pangolin coronavirus and a bat coronavirus, and pangolins may have acted as an intermediate host for the virus.

Since the first cases were detected, the COVID-19 virus has spread to almost every country in the world and has been linked to the deaths of more than 404,000 people of over 7 million confirmed cases[11]. Tracing the evolution and spread of the virus is important for developing vaccines and drugs as well as proposing appropriate intervention strategies. Monitoring and analysing the viral genome mutations can be helpful for this task. Due to a strong immunologic pressure in humans, the virus may have mutated over time to circumvent responses of the human immune system. This leads to the creation of virus variants with possible different virulence, infectivity, and transmissibility[12]. This paper reports all point mutations occurring so far in SARS-CoV-2 and presents exemplified implications obtained from the analysis of these mutation pattern data. Four types of mutations, which include synonymous, nonsynonymous, insertion and deletion, are detected. We use 6324 SARS-CoV-2

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Shri Ramdeobaba College of Engineering & Management, Nagpur -440013

Department of Computer Science and Engineering

Innovations by the Faculty in Teaching and Learning

Semester: VI | Course Code: CST451-1

Course Name: Machine Learning | Session: 2021-22

Learning Pedagogy used: Student Paper Presentation

Abhishek chohan (Roll no 32) of VII semester has presented a research paper "Inception Generators for Generative Adversarial Networks" in 4th International Conference on Recent Scientific and Technological Trends (23-24 April 2022). He has presented an innovative idea in generative models of Deep Learning. He has used NVIDIA DGX Server in our department for training the generative model. The paper is published in Scopus journal "International Journal of Health Sciences (IJHS)"

Ramchand.

Ramchand Hablani

Shri Ramdeobaba College of Engineering & Management

Department of CSE

Fifth Semester [Shift I] Session 2021-22

Computer Networks

Innovative Assessment

All students of V semester were asked to submit a Poster on the following topics. The poster should show the creativity in design and also the concept should be explained in a short manner and should be made easy to understand. The poster can be drawn on white drawing sheet. Flowcharts, diagrams can be used. Original creative ideas will be given more weightage.

Roll Number	Poster Topic
Roll number ending with 1	Application areas of CN
Roll number ending with 2	OSI Model
Roll number ending with 3	TCP/IP Model
Roll number ending with 4	LAN
Roll number ending with 5	WAN
Roll number ending with 6	Go back n
Roll number ending with 7	Simplex Stop and Wait Protocol
Roll number ending with 8	Physical Media
Roll number ending with 9	Wireless Transmission
Roll number ending with 0	CDMA

All the students submitted creative posters for the above activity.

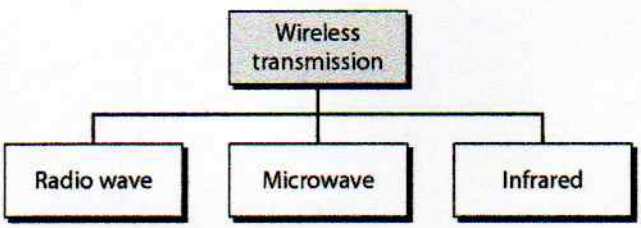
Some sample posters are attached herewith.

Wireless Transmission

Wireless transmission is a form of unguided media.

Wireless communication involves no physical link established between devices.

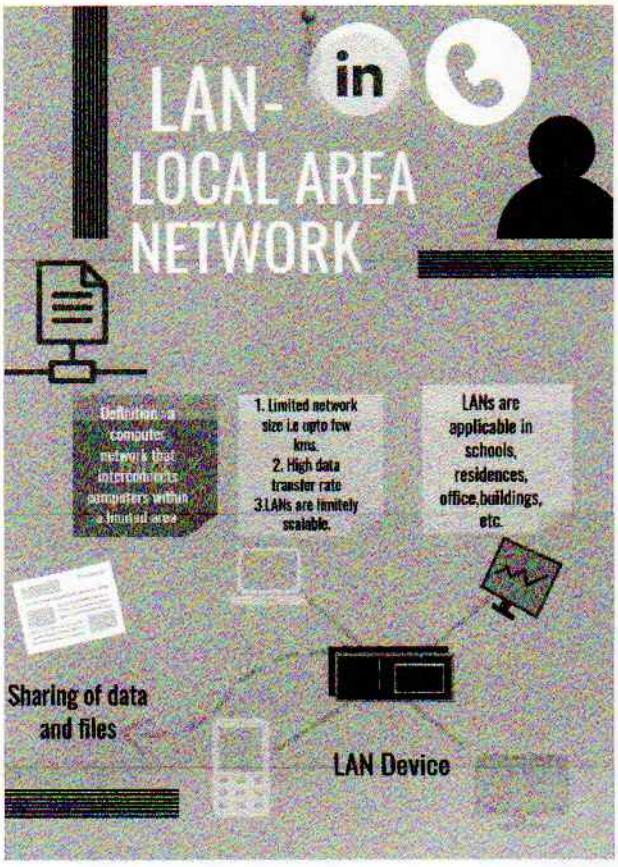
Thus, Wireless communication is the transfer of information between two or more points that do not use an electrical conductor as a medium by which to perform the transfer.



Radio Waves: The most common wireless technologies use radio waves.

Micro Waves: A microwave link is a communications system that uses a beam of radio waves in the microwave frequency range(Low frequency range) to transmit

Infrared: It is the use of infrared transmission technology in devices and equipments for sending data to other devices and/or controlling them wirelessly by human operators.



Coordinator: Dr. Rashmi Welekar

Teacher Assessment: 1

Role Play

1. **Algorithm selected:** *Round Robin*

2. **Name of students:**

Hrishita Barkhade - 07
Oshika Roy - 09
Shristi Gupta - 23
Shruti Jain - 24
Prathamesh Gujar - 52

3. **Problem Statement:**

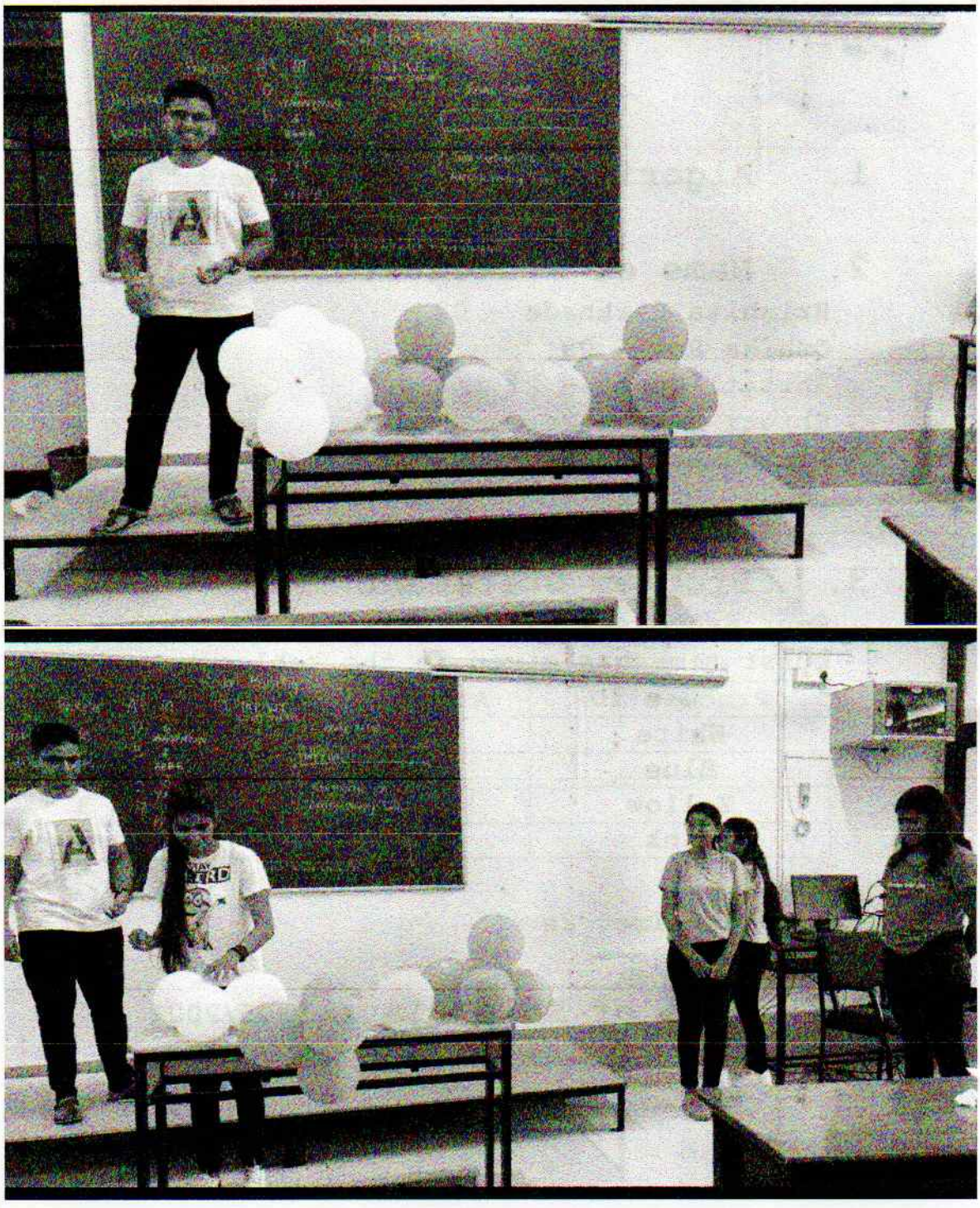
Four processes with process ID, arrival time and burst time has given in the table:

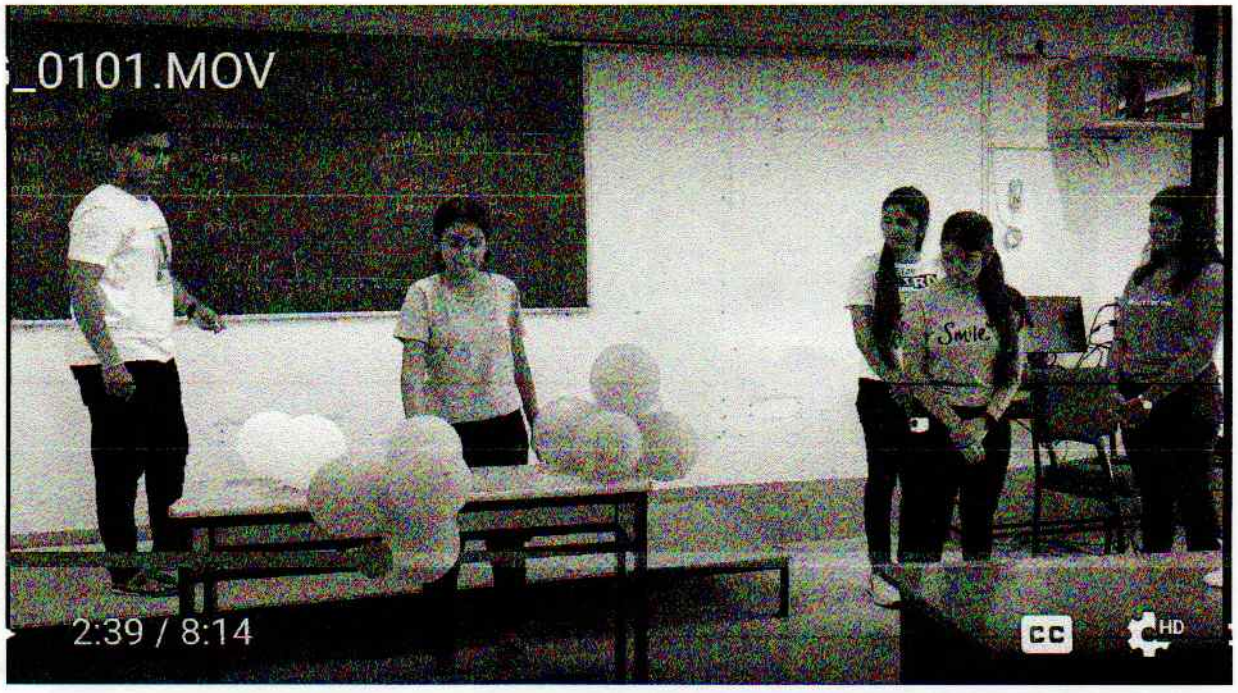
Process ID	Arrival Time	Burst Time
White	0	6
Blue	5	4
Yellow	2	3
Pink	7	5

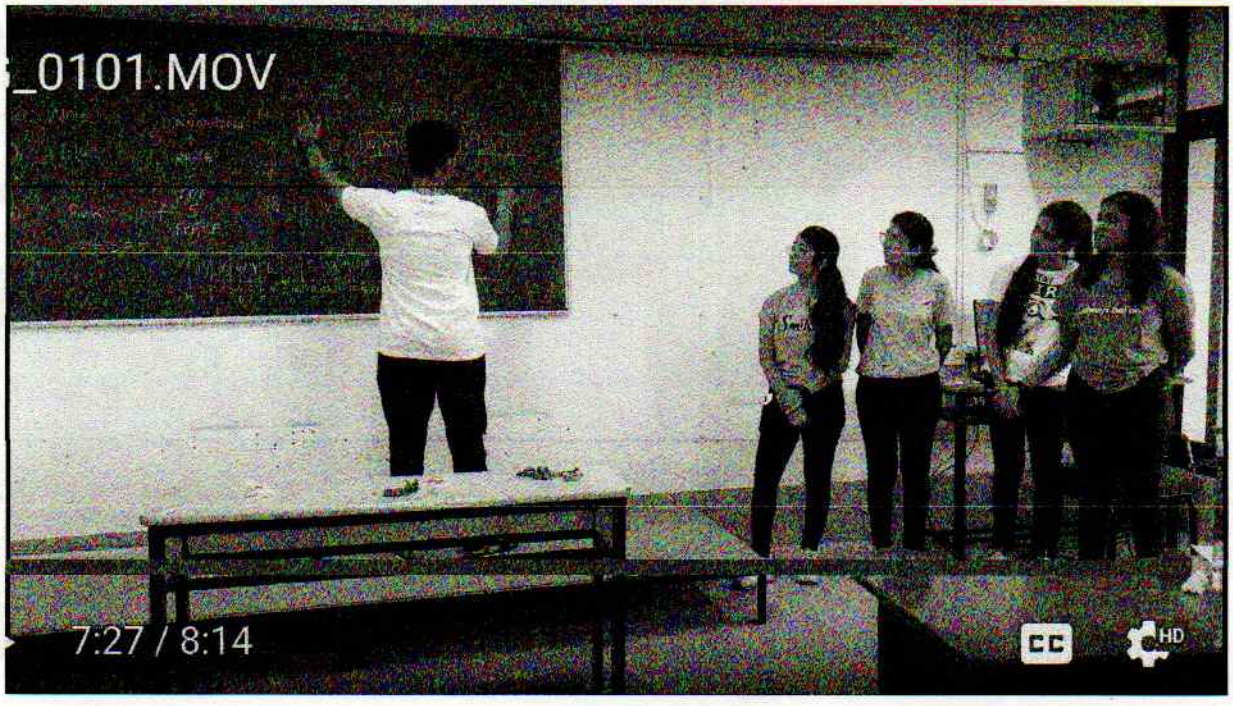
Quantum time: 2s

4. **Date of Role Play:** 9/05/2022

5. Screenshots of recorded video:




_0101.MOV
2:39 / 8:14
CC
HD


_0101.MOV
7:27 / 8:14
CC
HD

6. Summary:

- Round Robin is a CPU scheduling algorithm where each process is assigned a fixed time slot in a cyclic way.
- It is a variant of 'First Come, First Served' scheduling.
- Round Robin is preemptive in nature.
- RR scheduling is also known as time slicing scheduling.
- Starvation does not occur because of its cyclic nature.
- If we want to give some process priority, we cannot.
- Throughput depends on quantum time.

Shri Ramdeobaba College of Engineering and Management, Nagpur
Department of Computer Science and Engineering
Session: 2021-22

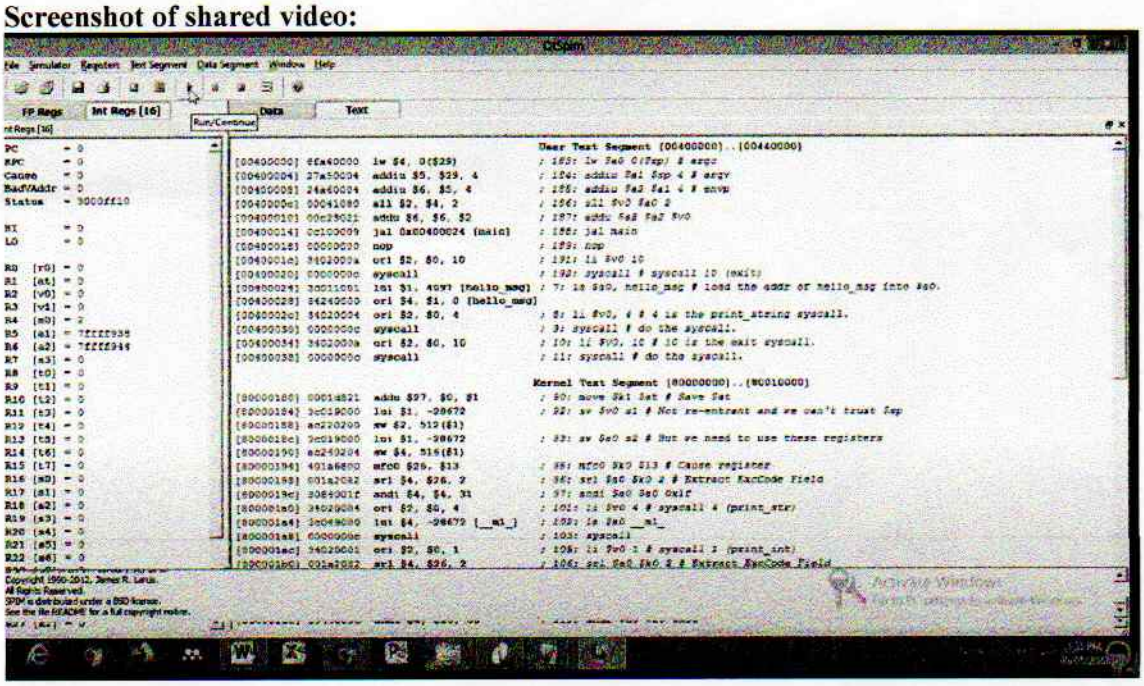
Subject: Computer Architecture and Organization (III Semester)

Component: Blended Learning

Methodology:

- Video of MIPS architecture recorded by course coordinator were share with students in which demonstration of Qtspim tool has been shown.
- Link of video: https://drive.google.com/file/d/10nekocrl8lnCaDKEWWwJzIMYmUTqnBcm/view?usp=sharing
- Students have been asked to go through video thoroughly and follow the instruction to install QtSpim.
- Students have been asked to make a single PDF of all codes and screenshot of its output with register contents and upload on the classroom.

Screenshot of shared video:



Sample questions are as follows:

Q1. Write the Assembly language code for finding the largest number among three numbers.
Q2. Write assembly language code for generating fibonacci series.
Q3. Write assembly language code to find factorial of number.
Q4. Write assembly code for following:

1. Get A from the user.
2. Get B from the user. If B = 0, terminate.

3. Set sentinel value S = A × B.
4. Set multiple m = A.
5. Loop:

    (a) Print m.
    (b) If m == S, then go to the next step.
    (c) Otherwise, set m = m + A, and then repeat the loop.

6. Terminate.

Q5. Write assembly code to convert an ASCII string representation of a integer into the corresponding integer.

[Sample Submission report attached]

Prof. Pravin Sonsare
Course Coordinator

COA TA-2

MIPS Architecture

Name: Kanak Jaiswal

Sec: D

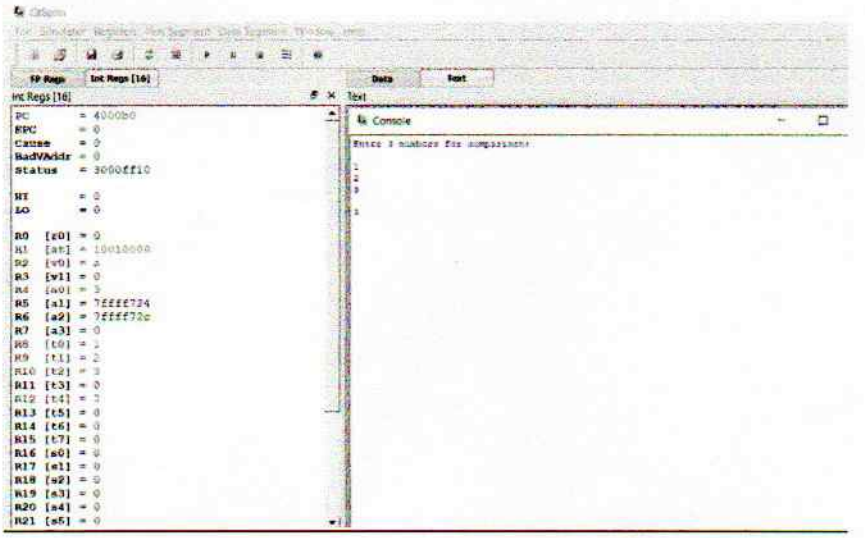
Roll no: 06

Q1. Write the Assembly language code for finding the largest number among three numbers.

File Edit Format View Help

```
.text
main:
        la $a0,words                    #print initial message
        li $v0,4
        syscall

        li $v0, 5                       #read integer from user and store in t0
        syscall
        move $t0, $v0

        li $v0, 5                       #read integer from user and store in t1
        syscall
        move $t1, $v0

        li $v0, 5                       #read integer from user and store in t2
        syscall
        move $t2, $v0

        bgt $t0, $t1, t0_bigger         #if $t0 > $t1, execute t0_bigger
        bgt $t1, $t2, t1_bigger         #if $t1 > $t2, execute t1_bigger
        move $t4, $t2
        b end                           #and then execute end statement
t0_bigger:
        bgt $t2, $t0, t2_bigger         #if $t2 > $t0, execute t2_bigger
        move $t4, $t0
        b end

t2_bigger:
        move $t4, $t2
        b end

t1_bigger:
        move $t4, $t1
        b end

end:
        la $a0,newline
        li $v0,4
        syscall

        move $a0, $t4
        li $v0, 1
        syscall


        li $v0, 10                      # syscall code 10 is for exit.
        syscall

.data
words:  .ascii "Enter 3 numbers for comparison:"
        .ascii "\n"

newline: .ascii "\n"
```

OUTPUT-

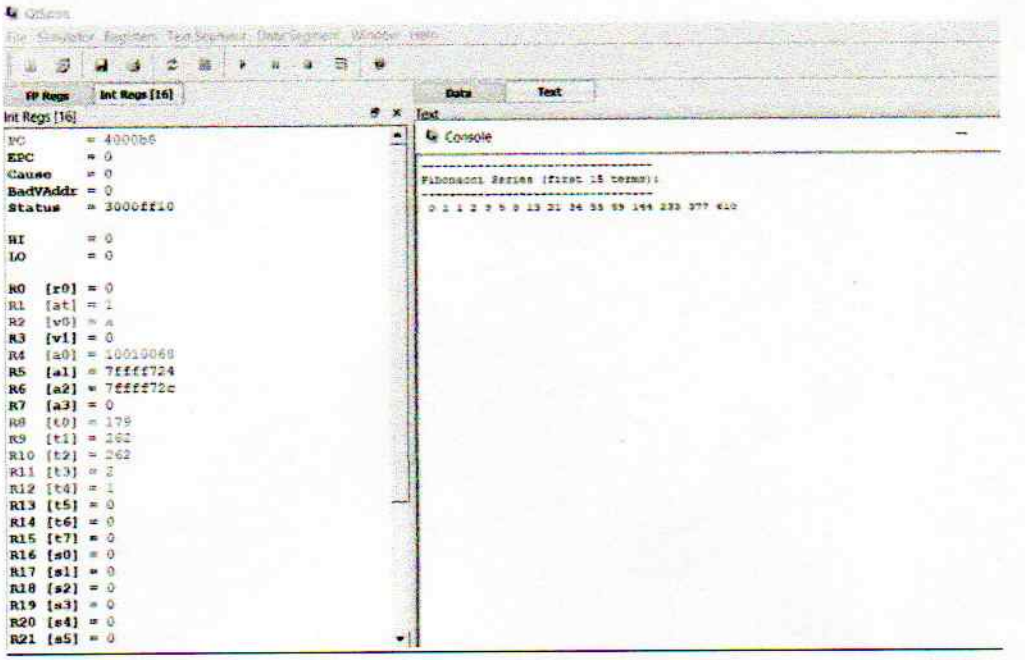


Q2. Write assembly language code for generating Fibonacci series

File Edit Format View Help

```
.text
main:
        la $a0,words      #printing initial message
        li $v0,4
        syscall

        li $t0,0
        la $a0,0
        li $v0,1
        syscall

        la $a0,space
        li $v0,4
        syscall

        li $t1,1
        la $a0,1
        li $v0,1
        syscall

        la $a0,space
        li $v0,4
        syscall

        li $t3,2          #loading value 2 in register t3
        li $t4,15         #this is the number of terms in the fibonacci series to be printed

loop:
        blt $t4,2,end     #executes end statement if content of t4 is less than 2
        add $t2,$t0,$t1   #stores the sum of content of t0 and t1 in t2
        move $a0,$t2      #move the result of t2 in a0
        li $v0,1
        syscall

        la $a0,space
        li $v0,4
        syscall

        move $t0,$t1      #move contents of t1 to t0
        move $t1,$t2      #move contents of t2 to t1
        sub $t4,$t4,1     #decrement value of t4
        j loop

end:
        li $v0,10
        syscall


.data
words:  .ascii "--------------------------------"
        .ascii "\n"
        .ascii "Fibonacci"
        .ascii " "
        .ascii "Series (first 15 terms): "
        .ascii "\n"
        .ascii "--------------------------------"
        .ascii "\n"

space: .ascii " "
```

OUTPUT-

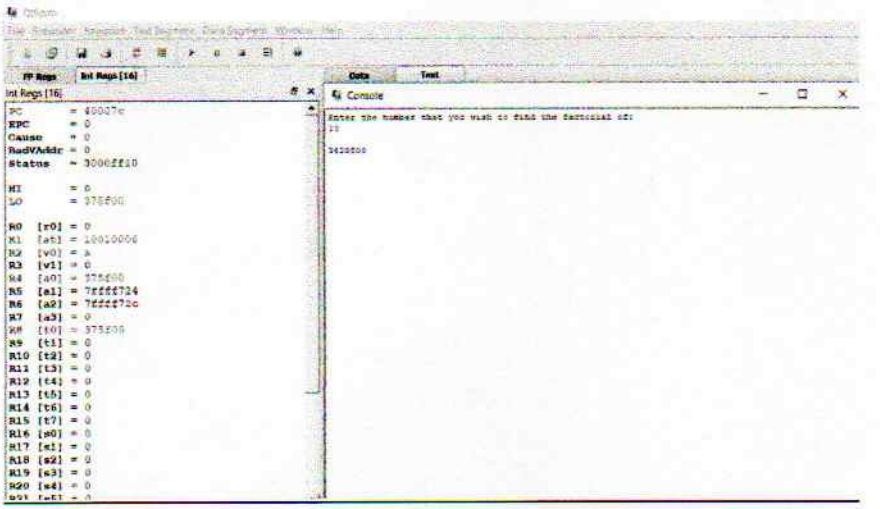


Q3. Write assembly language code to find factorial of number.

File Edit Format View Help

```
.text
main:
        la $a0, words                   #print initial message
        li $v0, 4
        syscall

        li $t0, 1                       #store the value 1 in t0

        li $v0, 5                       #read integer from user and store in t1
        syscall
        move $t1, $v0

loop:
        blt $t1, 1, end                 #execute end statement if content of t1 is less than 1
        mult $t0, $t1                   #product of content of t0 and t1 is stored in special registers Lo and Hi
                                        #(Hi, Lo) = $t0 * $t1

        mflo $t0                        #move quantity in special register Lo to $t0 such that $t0 = Lo
        sub $t1, $t1, 1                 #decrement value of t1 by 1
        j loop

end:
        la $a0, newline
        li $v0, 4
        syscall

        move $a0, $t0                   #move contents of t0 to a0
        li $v0, 1                       #print result
        syscall

        li $v0, 10
        syscall

.data
words: .ascii "Enter the number that you wish to find the factorial of: "

newline: .ascii "\n"
```

OUTPUT-



Q4.Write assembly code for following:

1. Get A from the user.

2. Get B from the user. If B = 0, terminate.

3. Set sentinel value S = A × B.

4. Set multiple m = A.

5. Loop:

    (a) Print m.

    (b) If m == S, then go to the next step.

    (c) Otherwise, set m = m + A, and then repeat the loop.

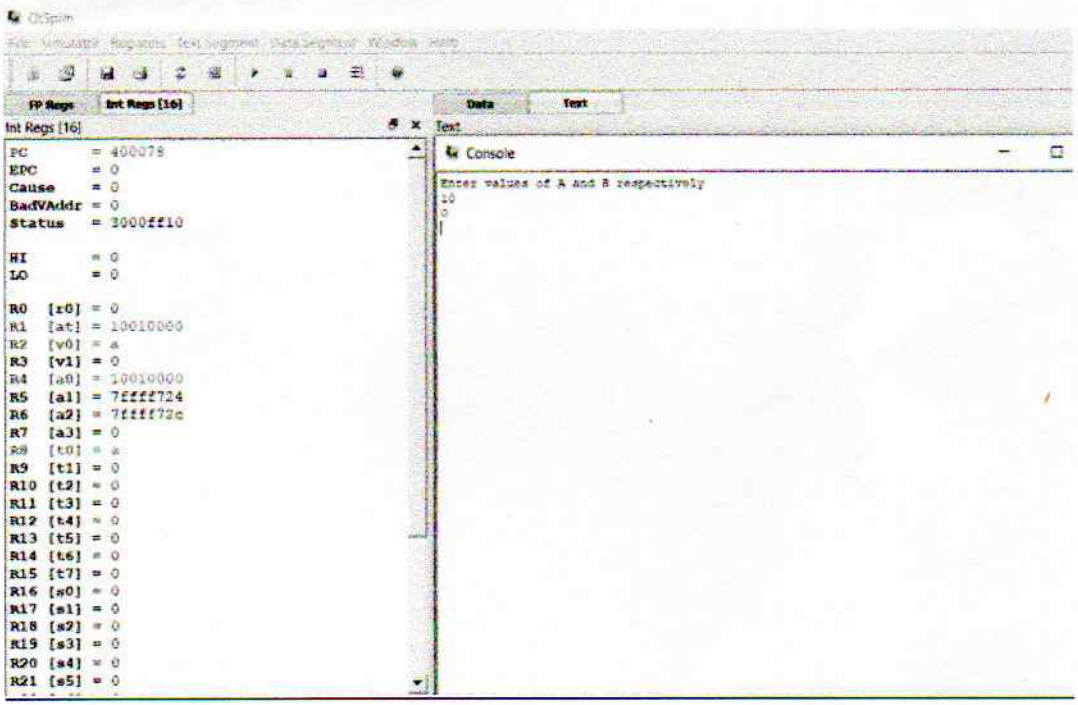
6. Terminate.

File Edit Format View Help

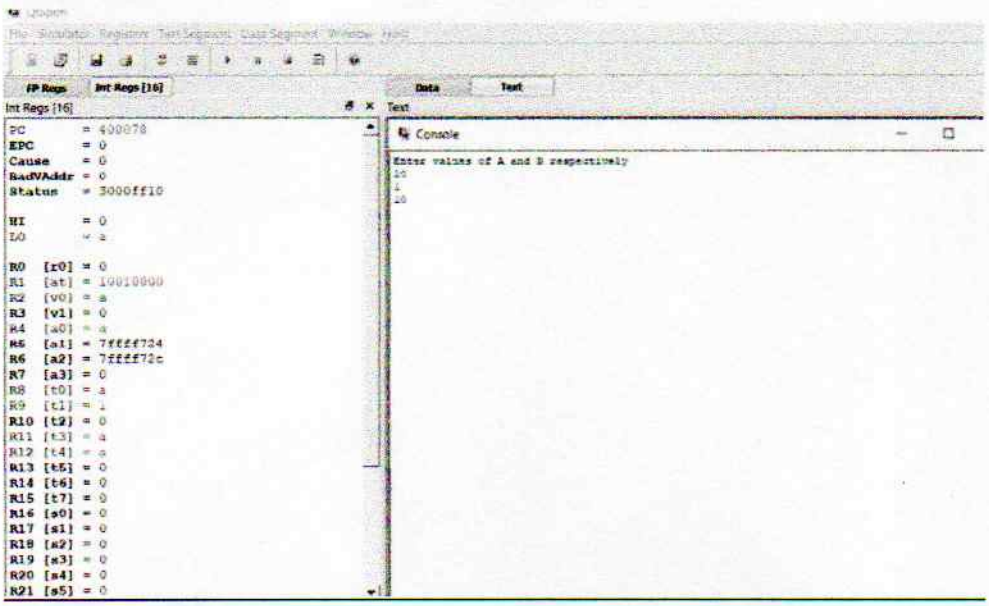
```
.text
main:
        la $a0,words            #print initial message
        li $v0,4
        syscall

        li $v0, 5               #read integer A from user
        syscall
        move $t0, $v0

        li $v0, 5               #read integer B from user
        syscall
        move $t1, $v0

        li $t5, 0               #assign value 0 to register t5

        beq $t1, $t5, end       #execute end statement if B == 0
        mul $t4, $t0, $t1       #multiplying S = A*B
        move $t3, $t0           #setting m = A
        j loop

loop:
        move $a0, $t3
        syscall
        beq $t3,  $t4, end      #execute end statement if S == m
        add $t5, $t3, $t0       #M = M+A
        move $t3, $t5

end:

        li $v0, 10              #syscall code 10 is for exit.
        syscall

.data
words:  .ascii "Enter values of A and B respectively\n"
```

OUPUT-

Case 1: When B = 0, program terminates

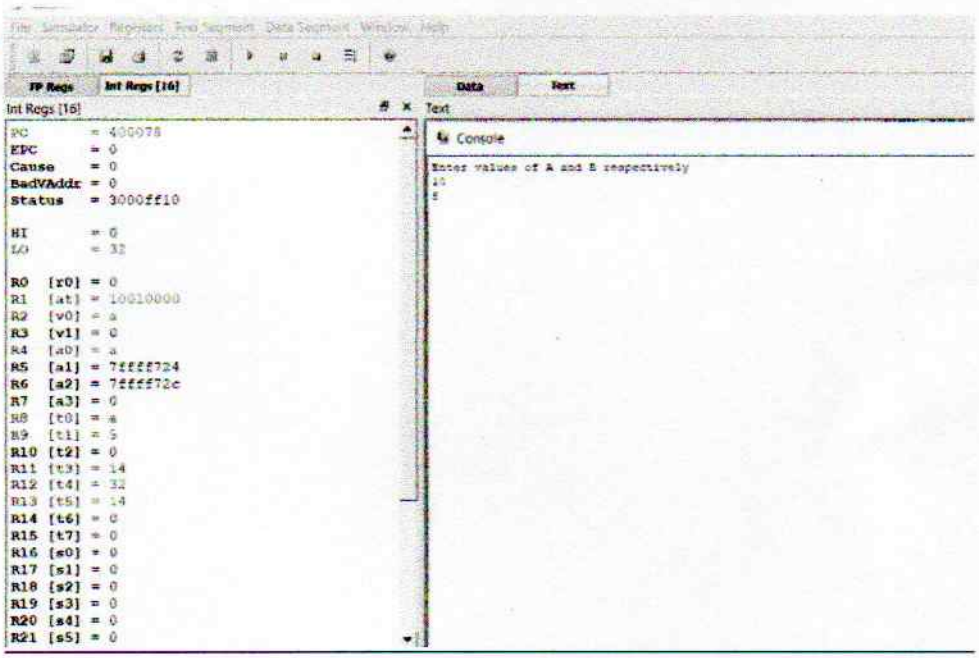


Case 2: When S == M, we print M and proceed to next step which was to terminate



We can see that S($t4) == M($t3) == "a" == 10 == A($t0)

Case 3: When S is not equal to M, we execute M = M + A and repeat loop.



Since value of A is 10, new value of M = M + A = 10 +10 = 20

We can see that M($t3) == $t5 == "14" (in hex) == 20 as $t5 stores the sum of M + A

Since value of B is 5

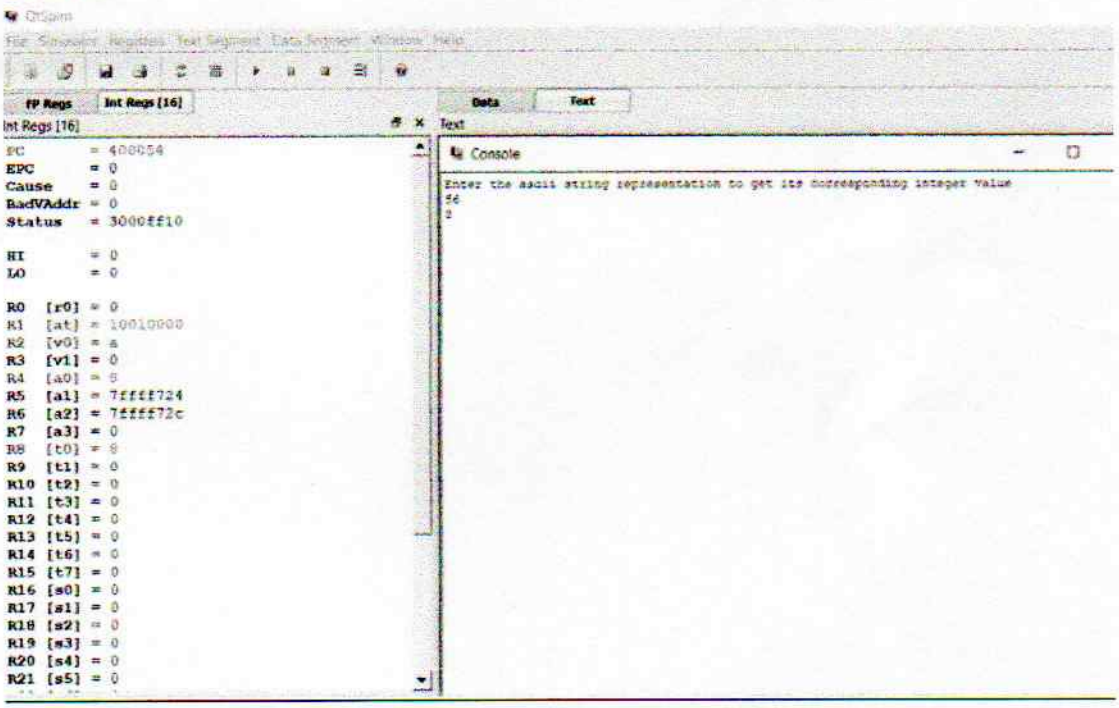
After repeating loop, S($t4) == "32" (in hex) == 50 as $t4 stores the product of A * B

Q5. Write assembly code to convert an ASCII string representation of a integer into the corresponding integer.

File Edit Format View Help

```
.text
main:
        la $a0,words                #print initial message
        li $v0,4
        syscall

        li $v0, 5                   #take input from user
        syscall

        move $t0, $v0
        sub $t0, 48                 #decrement the input value by 48
        move $a0, $t0               #print output
        li $v0, 1
        syscall

        li $v0, 10
        syscall

.data
words:  .ascii "Enter the ascii string representation to get its corresponding integer value\n"
```

OUTPUT-



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Shri Ramdeobaba College of Engineering & Management, Nagpur -440013

Department of Computer Science and Engineering

Innovations by the Faculty in Teaching and Learning

Semester: VI **Course Code:** CSP358

Course Name: Compiler Design Lab **Session:** 2021-22

Learning Pedagogy used: Flipped Classroom, Role of ICT

Short description of innovative learning pedagogy used:

- All types of parsers were discussed in detail in theory class. The students were given the problem definition to design a parser for the given context free grammar & also to validate the given sentence.
- Based on the concepts of parser discussed in theory & lab, the students have designed the small dictionary of natural language words & validated the natural language sentences as per the grammar rules. The students learn the working of the parser for validating the formal language & applied this concept for the implementation of parser for natural language.
- The students also validated the string for the LL (1) parser and have visualized the implementation of parser & parse tree generation in virtual lab.
- The students were given the Research paper & asked to read the research paper, understand the paper & implement the various modules of the paper.

PROBLEM DEFINITION
[Sample Program attached]

PRACTICAL No. 4

Topic: Parsing

(A) Write a program to validate a natural language sentence. Design a natural language grammar, compute and input the LL (1) table. Validate if the given sentence is valid or not based on the grammar.

Input: NLP grammar and LL (1) parsing table (from file)
Implementation: String parsing rules
Output: Each step-in string parsing and whether the input string is valid or invalid.

(B) Use Virtual Lab on LL1 parser to validate the string and verify your string validation using simulation.
Link for Virtual Lab: http://vlabs.iitb.ac.in/vlabs-dev/vlab_bootcamp/bootcamp/system_deligators/labs/exp2/index.php
Output: Validation from Virtual lab simulator

PRACTICAL No. 7

Topic: Using SDTS for Language Conversion

(A) Read the Research paper provided to understand the use of SDTS in language translation from English to Hindi.

(B) Write a program to implement tokenizer, syntax analyzer, and to perform syntax directed translation for conversion from English to Hindi as per the research paper. Implement all the functions and extend the procedure to generate correct Hindi sentence.

Input: sentence in English language

Output: Conversion of input in English language to Hindi language

(S. C. Tispude) (V. Bongirwar)

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Shri Ramdeobaba College of Engineering and Management, Nagpur
Department of Computer Science and Engineering
Session: 2021-22

Subject: Python Programming Lab (III Semester)

Component: Projects based learning in the Lab

Lab conduction Methodology:

- Hands-on sessions were first conducted for each lab and then students were given problem statements to solve.
- Lab experiments followed by Project Building by students.

PROJECT GROUPS AND TITLE OF PROJECT
[Sample Macro-project report attached]

Group Number	Roll Number	Name	Project Name
Group 1	4	Akshita Deshmukh	Billing System
	15	Khushi Savaliya	
	26	Aditya Bopche	
	37	Devesh Wadhwani	
Group 2	5	Alsaniya Hussain	Fitness tracker
	6	Anushka Khandelwal	
	36	Chaitreya Bhelkar	
	38	Dhruvraj Solanki	
Group 3	10	Harshita Goydani	Virtual Desktop Assistant (which will reconize the command through our voice and then it will execute it)
	20	Muskan Kumar	
	21	Shrushati thawre	
	28	Alkesh Tripathi	
Group 4	14	Ketaki Tank	Weather Tracker
	16	Poorvi Asatkar	
	18	Samiksha Panpaliya	
	19	Shweta Mishra	
	22	Amna Patel	
Group 5	27	Afnanurrahim Mohd. Rafiuddin Ansari	Non graphical snake and ladder game
	30	Ankan Deb	
	32	Atharva Abhay Rewatkar	
	33	Atharva Rahul Bhoyar	

Group 6	3	Adishree Thakur	Daily task-scheduler
	8	Esha Kumbhare	
	13	Jiya Rathi	
	17	Rujuta Yugaonkar	
Group 7	29	Amaan Khan	Plagarism checker
	34	Bipul Biswas	
	35	Chaitanya Murarka	
Group 8	1	Aarya Balpande	A Voice Automated Atlas Quiz using python.
	2	Aashi Khanna	
	7	Bhavika Bhojwani	
	9	Harsha Hargunani	

Prof. Khushboo Khurana
Course Coordinator

PRP.

PROJECT

MOBILE APPLICATION PROGRAMMING GUIDEBOOK

V Semester, Shift I, B.E. CSE

Roll No. Name of Student

21 Rida Zuber

60 Dhiraj Kungwani

Guide

Prof. P.R.Pardhi

Shri Ramdeobaba College of Engineering & Management, Nagpur
Department of Computer Science and Engineering

Session 2019-20

OBJECTIVE:

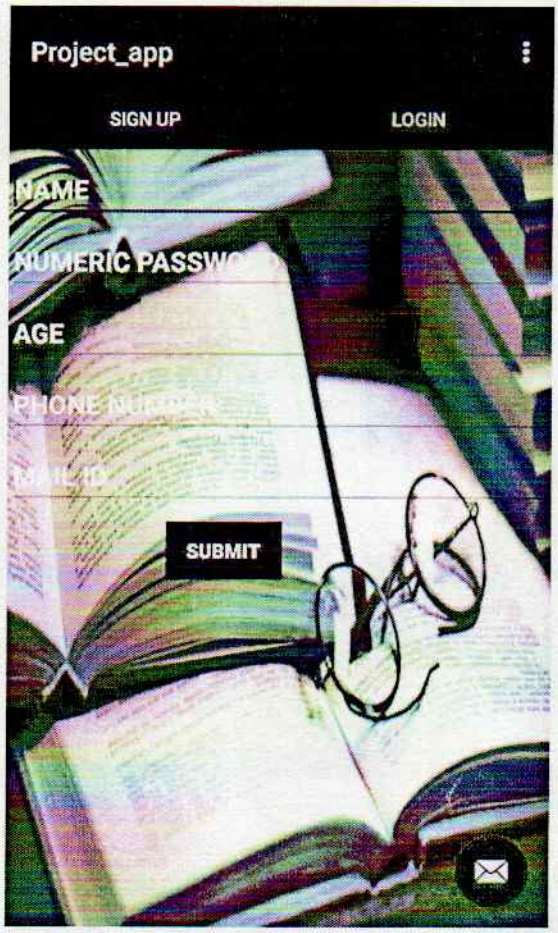
A Mobile Application consisting of various features for a student that would work as an aid for all the students who are willing to study and not getting the proper facilities. The app consists of six modules, namely :

1. Book Order
2. Revise (Conversion of speech to text)
3. Mathematical Test (QR scanned)
4. Any doubts?
5. Contact us
6. Study Material

DETAILED VIEW:

1. The Login Page:

Takes the credentials of new user and sends an SMS for required OTP. For pre-existing users, username and password are sufficient.



2.The Home Page:

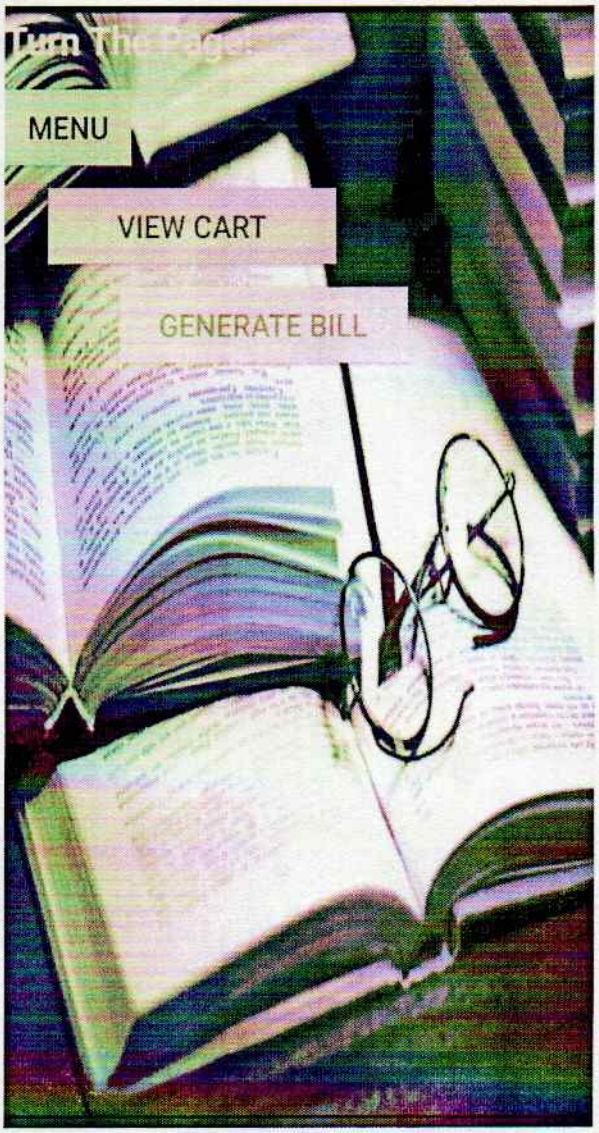
It consists of the links, i.e. Image Buttons which follows to different pages.

3. Six Modules:

A. Turn the Page:

A book ordering portal that would connect different retailers to students according to the region in which they reside.

EditText is provided to enter the address and contact no. and the selected books are added to the cart.

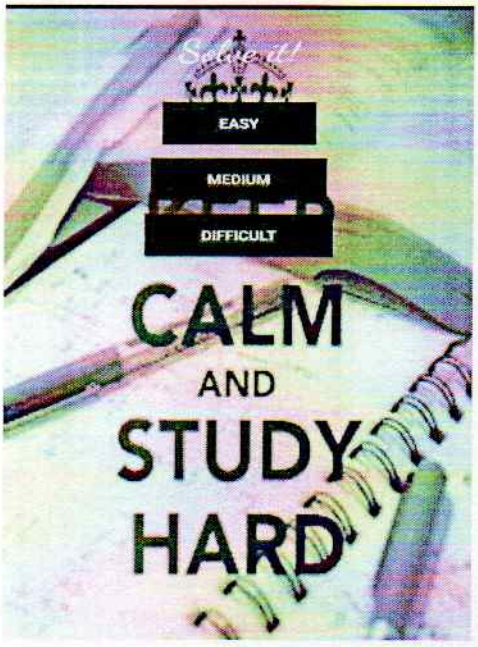


B. Test Yourself:

QR scanner to start a new test.

C. Study Material:

Links to different books.

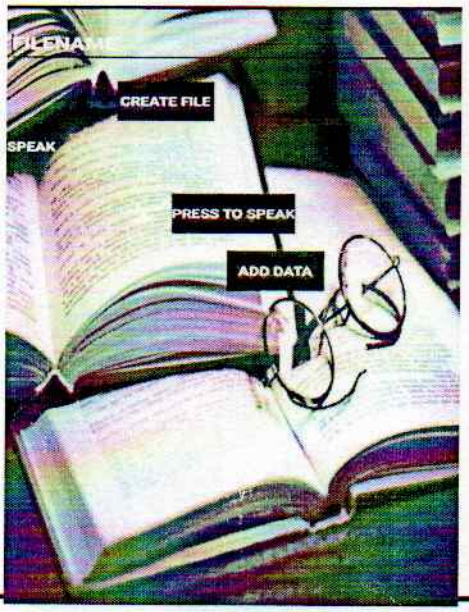


D. Let's Revise:

Speech to text Converter.

E. Contact us:

Mail Facilities using Intent.



VR

Shri Ramdeobaba College of Engineering and Management, Nagpur -440013

Department of Computer Science and Engineering

Session 2021-22

Course: Design Patterns – CST355-4

Semester: V **Section: B**

Case Study Conduction Details:

- All design patterns and its usage with hands on practice was covered during theory classes.
- A case study to design a text editor was given to groups formed by the students.
- The students analyzed the problem in detail suggesting a combination of design patterns for the problem followed by a group discussion with the course instructor.
- A few students were also encouraged to code their solution in Java and present it.

Assessment Assigned: Oct 11, 2021

Submission Date: Oct 23, 2021

Prof. Vasundhara Rathod

Course Coordinator

Shri Ramdeobaba College of Engineering and Mangement, Nagpur

Department of Computer Science and Engineering

DESIGN PATTERNS - V Semester [Shift-II]

Case Study Groups [Session 2021-22]

SN	Group Number	Roll Number	Name of Student
1	1	11	Abhiyant Gwalani
2		25	Deep Patidar
3		50	Nabeel Khan
4		52	Nitesh Dani
5		53	Padmanabh Rathi
6		71	Rahul Agrawal
7		84	Varun Kalbhore
8	2	22	Chetan Pardhi
9		76	Shivam Gupta
10		86	Saiyyed Khhizr Aalam
11		104	Ishika Bajaj
12		105	Lakshita Werulkar
13		106	Mukul Barbate
14	3	2	Harshita Barapatre
15		3	Himani Dighorikar
16		32	Navya Verma
17		34	Nidhi Misra
18		35	Rachita Bharambe
19		61	Radha Malichkar
20		62	Sagarika Jaywant
21	4	24	Chinmay Shanbhag
22		15	Ashtavinayak Pande
23		45	Hitesh Bhagchandani
24		48	Kartik Agrawal
25		102	Bhavesh Chawla
26		103	Sudhanshu Bajpai
27	5	23	Chinmay Gumgaonkar
28		13	Aman Bhargav
29		73	Rajat Lanjewar
30		81	Tanmay Bisen
31		74	Sameer Mishra
32		75	Sayandeep Ghosh

AJA

SHRI RAMDEOBABA COLLEGE OF ENGINEERING AND MANAGEMENT, NAGPUR

Department of Computer Science and Engineering

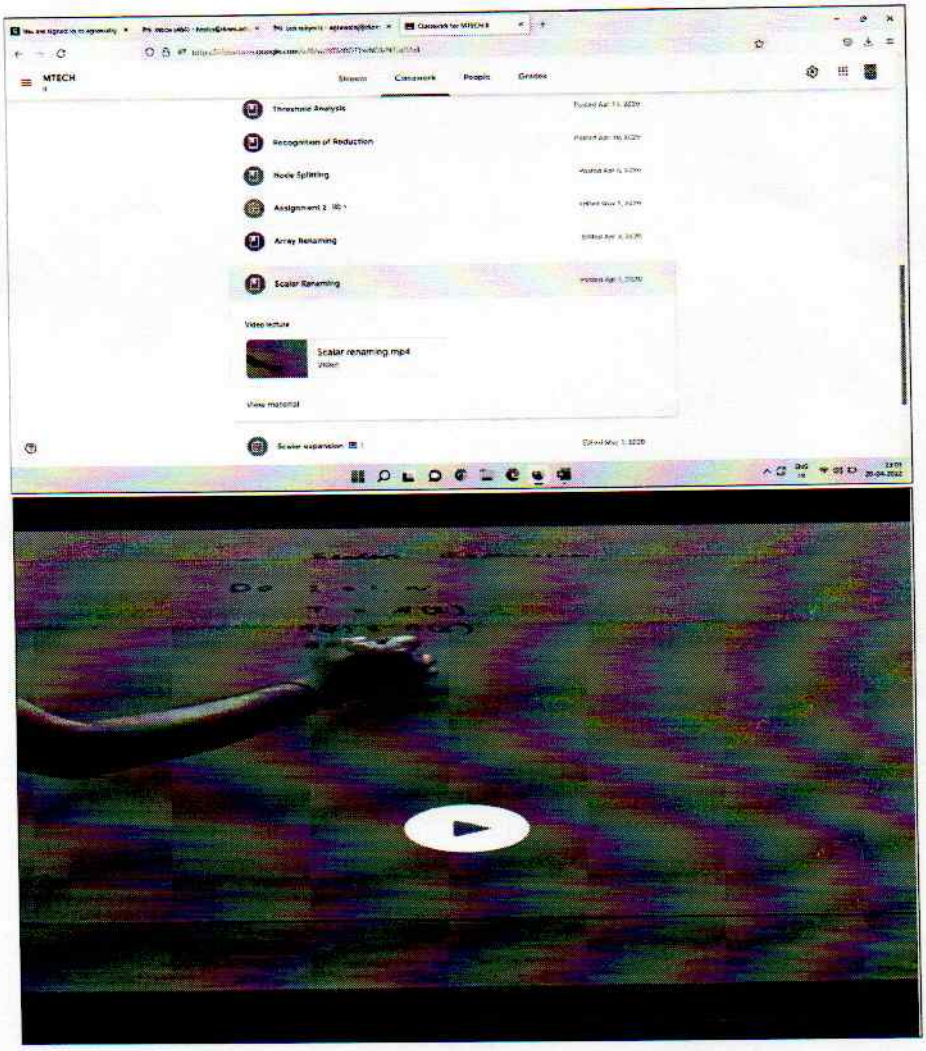
Innovation in Teaching Learning (2019-20)

Course Code: CST556 **Course Title:** Compiling for High Performance Architecture

Semester: II semester M.Tech. **Course Coordinator:** Dr. Avinash J. Agrawal

Learning Pedagogy : Remote Blended Learning

After the sudden announcement of Lockdown due to the COVID 19 pandemic, all teaching learning activities at campus stopped in March 2020. Till that time 60-70% of syllabus was covered. After waiting for few days, the course coordinator recorded the video lectures at home for remaining portion of the syllabus and shared it with the students though google classroom one lecture per day. The sharing of lecture followed by online discussion/doubt resolution sessions through google meet. Total 12 recorded video lecture were shared with the students during April 2020 (early period of lockdown)



Dr. Avinash J. Agrawal
Course Coordinator

AJA

SHRI RAMDEOBABA COLLEGE OF ENGINEERING AND MANAGEMENT, NAGPUR

Department of Computer Science and Engineering

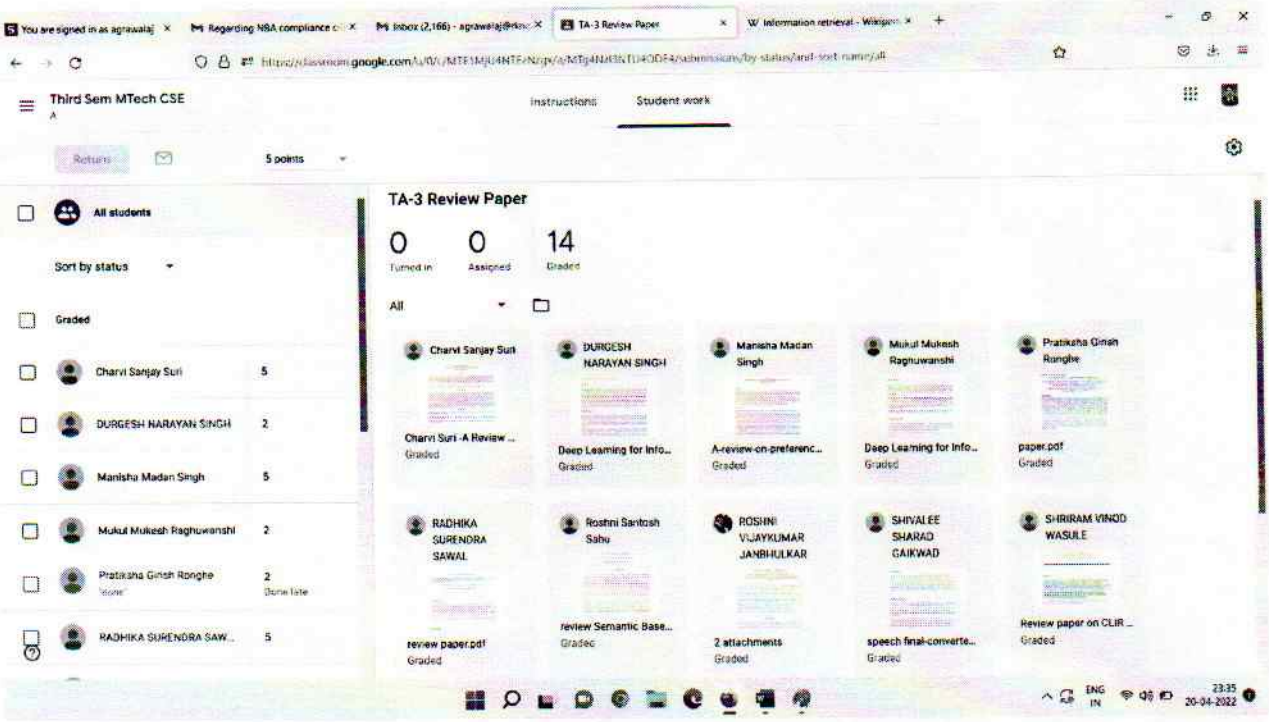
Innovation in Teaching Learning (2020-21)

Course Code: CST602-3 **Course Title:** Information Retrieval

Semester: III semester M.Tech. **Course Coordinator:** Dr. Avinash J. Agrawal

Learning Pedagogy : Innovative Teacher's Assessment

Information Retrieval is a relatively new area of research. Lot of research is done in recent years to make it more useful. In the course of Information retrieval, basic issues, methodologies are covered. To expose students towards the real information retrieval, recent development in IR and various application of IR techniques, an assignment to prepare a literature review on various sub domain of Information retrieval was given. Students were given a list of topics related to information retrieval. Each student is required to select a topic of his/her interest. They are then asked to read at least 5-6 research papers on the topic and prepare a literature review. All 14 students have submitted literature review. Few students have also submitted the same review to international conference and their work was accepted and well appreciated.



Dr. Avinash J. Agrawal
Course Coordinator

AMK

Shri Ramdeobaba College of Engineering and Management

Department of Computer Science and Engineering

Innovations by Faculty in Teaching and Learning

Assessment year : 2020-21

Semester : VII

Course code : CST411 Course name : Data Warehousing and Mining

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Learning Pedagogy used : Demonstration of code

Description : The students were given live demonstration of code execution for B-tree index, hashing, clusters, partitioning, index organized table, and function based index during regular lectures. The above code was executed on Oracle 11g. The students were also made aware of an online Oracle SQL tool, namely LiveSQL. This helped the students in understanding how different objects were created and implemented in Oracle. Improvement in execution time with the help of indexes was demonstrated using the SH schema. Creating partitions and storing them in different tablespaces was shown. The creation and use of overflow area in an Index Organized Table was also demonstrated with the help of various examples. Through these demonstrations the students learnt the proper use of these objects.

Submitted by :

AMKarandikar

A. M. Karandikar

Attachment : Link of lecture recording.

[https://drive.google.com/drive/search?q=before:2020-08-31%20after:2020-08-01%20type:video]

Machine Learning

Report

Session 2019-2020.

Topic : NAÏVE BAYES CLASSIFIER

Submitted to: Ms. Sweta Jain

Submitted by: Anuradha Dubey (06)

Sheetal Hablani(25)

1.Introduction

The Naive Bayes algorithm is an intuitive method that uses the probabilities of each attribute belonging to each class to make a prediction. It is the supervised learning approach to model a predictive modelling problem probabilistically.

Naive Bayes simplifies the calculation of probabilities by assuming that the probability of each attribute belonging to a given class value is independent of all other attributes. This is a strong assumption but results in a fast and effective method.

The probability of a class value given a value of an attribute is called the conditional probability. By multiplying the conditional probabilities together for each attribute for a given class value, we have a probability of a data instance belonging to that class. To make a prediction we can calculate probabilities of the instance belonging to each class and select the class value with the highest probability.

2.Data Set

The test problem we used is the Pima Indians Diabetes problem.
This problem is comprised of 768 observations of medical details for Pima Indians patents. The records describe instantaneous measurements taken from the patient such as their age, the number of times pregnant and blood workup. All patients are women aged 21 or older. All attributes are numeric, and their units vary from attribute to attribute.

The attributes are:

1.Pregnancies
Number of times pregnant

2.Glucose
Plasma glucose concentration a 2 hours in an oral glucose tolerance test

3.BloodPressure
Diastolic blood pressure (mm Hg)

4.SkinThickness

Triceps skin fold thickness (mm)

5.Insulin
2-Hour serum insulin (mu U/ml)

6.BMI
Body mass index (weight in kg/(height in m)^2)

7.DiabetesPedigreeFunction
Diabetes pedigree function

8.Age
Age (years)

9.Outcome
Class variable (0 or 1) 268 of 768 are 1, the others are 0

Dataset instances:

6,148,72,35,0,33.6,0.627,50,1

1,85,66,29,0,26.6,0.351,31,0

8,183,64,0,0,23.3,0.672,32,1

1,89,66,23,94,28.1,0.167,21,0

0,137,40,35,168,43.1,2.288,33,0

3.Steps:

1. **Handle Data**: Load the data from CSV file and split it into training and test datasets.
2. **Summarize Data**: summarize the properties in the training dataset so that we can calculate probabilities and make predictions.
3. **Make a Prediction**: Use the summaries of the dataset to generate a single prediction.
4. **Make Predictions**: Generate predictions given a test dataset and a summarized training dataset.

5. **Evaluate Accuracy**: Evaluate the accuracy of predictions made for a test dataset as the percentage correct out of all predictions made.
6. **Tie it Together**: Use all of the code elements to present a complete and standalone implementation of the Naive Bayes algorithm.

Prediction is calculated by using **Gaussian Probability Density Function.**

We can divide this part into the following tasks:

1. Calculate Gaussian Probability Density Function
2. Calculate Class Probabilities
3. Make a Prediction
4. Estimate Accuracy

Calculate Gaussian Probability Density Function

We can use a Gaussian function to estimate the probability of a given attribute value, given the known mean and standard deviation for the attribute estimated from the training data.

Distribution	Functional Form	Mean	Standard Deviation
Gaussian	$f_g(x) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{\frac{-(x-a)^2}{2\sigma^2}}$	a	σ

3.Code :

```
# Example of Naive Bayes implemented from Scratch in Python
import csv
import random
import math

def loadCsv(filename):
	lines = csv.reader(open(filename, "rb"))
	dataset = list(lines)
	for i in range(len(dataset)):
		dataset[i] = [float(x) for x in dataset[i]]
	return dataset

def splitDataset(dataset, splitRatio):
	trainSize = int(len(dataset) * splitRatio)
	trainSet = []
	copy = list(dataset)
	while len(trainSet) < trainSize:
		index = random.randrange(len(copy))
		trainSet.append(copy.pop(index))
	return [trainSet, copy]

def separateByClass(dataset):
	separated = {}
	for i in range(len(dataset)):
		vector = dataset[i]
		if (vector[-1] not in separated):
			separated[vector[-1]] = []
		separated[vector[-1]].append(vector)
	return separated

def mean(numbers):
	return sum(numbers)/float(len(numbers))

def stdev(numbers):
	avg = mean(numbers)
	variance = sum([pow(x-avg,2) for x in numbers])/float(len(numbers)-1)
	return math.sqrt(variance)

def summarize(dataset):
	summaries = [(mean(attribute), stdev(attribute)) for attribute in zip(*dataset)]
	del summaries[-1]
	return summaries

def summarizeByClass(dataset):
	separated = separateByClass(dataset)
	summaries = {}
	for classValue, instances in separated.iteritems():
		summaries[classValue] = summarize(instances)
	return summaries
```

```
def calculateProbability(x, mean, stdev):
	exponent = math.exp(-(math.pow(x-mean,2)/(2*math.pow(stdev,2))))
	return (1 / (math.sqrt(2*math.pi) * stdev)) * exponent

def calculateClassProbabilities(summaries, inputVector):
	probabilities = {}
	for classValue, classSummaries in summaries.iteritems():
		probabilities[classValue] = 1
		for i in range(len(classSummaries)):
			mean, stdev = classSummaries[i]
			x = inputVector[i]
			probabilities[classValue] *= calculateProbability(x, mean, stdev)
	return probabilities

def predict(summaries, inputVector):
	probabilities = calculateClassProbabilities(summaries, inputVector)
	bestLabel, bestProb = None, -1
	for classValue, probability in probabilities.iteritems():
		if bestLabel is None or probability > bestProb:
			bestProb = probability
			bestLabel = classValue
	return bestLabel

def getPredictions(summaries, testSet):
	predictions = []
	for i in range(len(testSet)):
		result = predict(summaries, testSet[i])
		predictions.append(result)
	return predictions

def getAccuracy(testSet, predictions):
	correct = 0
	for i in range(len(testSet)):
		if testSet[i][-1] == predictions[i]:
			correct += 1
	return (correct/float(len(testSet))) * 100.0

def main():
	filename = 'pima-indians-diabetes.data.csv'
	splitRatio = 0.67
	dataset = loadCsv(filename)
	trainingSet, testSet = splitDataset(dataset, splitRatio)
	print('Split {0} rows into train={1} and test={2} rows').format(len(dataset), len(trainingSet),
len(testSet))
	# prepare model
	summaries = summarizeByClass(trainingSet)
	# test model
	predictions = getPredictions(summaries, testSet)
	accuracy = getAccuracy(testSet, predictions)
	print('Accuracy: {0}%').format(accuracy)
```

```
main()
```

4.Output:

```
Split 768 rows into train=514 and test=254 rows

Accuracy: 76.3779527559%
```