**Problem I**

A matrix of order 3X3 or m X n in general is shown below.

4 5 8

3 9 11

7 3 6

The same matrix is written out in a liner, vertical fashion, row by row is shown below.

4

5

8

3

9

11

7

3

6

Take the case of 11. It is in the 2nd row and third column – or in general at (i, j) = (2, 3)

When written in the liner fashion, 11 is the 6th element in the sequence, or in general Nth

element

Can you derive a formula for I and j and write a program for finding the i, j for the Nth element of the liner sequence, given the order of the matrix is m X n?

OR

in other words, formulate i and j as a function of m, n and N

i = f(m, n, N)

j = f(m, n, N)

code :

mat = [11,21,30,40,50,60,70,80]

m=2

n=4

num = 50

N = mat.index(num)+1

i = (((N-1))//n)+1

j = ((N-1)%n)+1

print (N,i,j)

**Problem II**

This text represents the digital content extracted from an image by an OCR tool. Ignore the misspellings and control characters.

Extract the all the dates, $amounts and lines containing other numbers from this following content which comes from an image to text conversion software:

LINE OF CREDIT NOTE

June 8,2016

$90,000,00 Boston, Massachusetts

For value received, the undersigned FIRST DENTAL AT STATION LANDING, LLC, a

Massachusetts limited liability company, with an address of 8 Earhart Landing, Medford, 3

Massachusetts 02155 (the ’Borrower"), promises to pay to the order of xxx Bank, N.A., a

national banking association with an address of 34 State Street, Boston, Massachusetts 02709

(together with its successors and assigns, the "Bank"), the principal amount of Ninety Thousand

Dollars and Zero Cents 7 ($90,000.00), or, if less, such amount as may be the aggregate unpaid

principal amount of at) loans or advances made by the Bank to the Borrower pursuant hereto, on

or before June 8, 2026 (the "Maturity Date”), as set forth below, together wiih interest from

the date hereof on the unpaid principal balance from time lo lime outstanding until paid in

full. Unit! the Conversion Date (as hereinafter defined), the aggregate principal balance

outstanding shalf bear interest thereon at a per annum rate equal to One £ Percent (1.00%)

above the Prime Rate (as hereinafter defined). Effective on the Conversion Daie, tiig\_ interest

rate payable on the aggregate principal balance outstanding shall be adjusted to a fixed rate

{the'J> "7 "Fixed Rate") equal to Four and One-Half Percent (4.50%) per annum.

This Note evidences a line of credit for the purpose of financing the cost of

leasehold improvements to the Borrower's current place of business. For Funded Leasehold

Improvements, advances shall be limited to a maximum of 100% of the invoices evidencing the

total cost of the leasehold improvements, acceptable to the Bank in its sole discretion, based

upon invoices or other evidence acceptable to the Bank.

Advances may be made from time to time until September 8, 2016 (the "Conversion

Date"). ^ Within the limits of time and amount set forth above and subject to the terms and

conditions set forth herein and In the other loan and security documents executed in connection

herewith, Borrower may borrow one or more advances hereunder provided, however, that amounts

repaid may not be reborrowed.

Prior to the Conversion Date, interest on the outstanding principal balance shall be

due and payable in arrears monthly commencing the month following the date of the first advance

on the 8th day . of each month. After the Conversion Date, this Note shall be repaid in equal

installments comprised of principal and interest (calculated by the Bank in the Bank's sole

discretion at the then applicable rate) based upon a 9 year 9 month amortization period

commencing on the Conversion Date, except that the last installment shall be due and payable on

the Maturity Date and shall be in an amount equal to the aggregate outstanding balance on the

Maturity Date.

Prime Rate means the rate per annum from time to time established by the Bank as the

Prime Rate and made available by the Bank at its main office or, in the discretion of the Bank,

the base, reference or other rate then designated by the Bank for general commercial ioan

reference puiposes, it being understood that such rate is a reference rate, not necessarily the

lowest, established from time to time, which serves as the basis upon which effective interest

rates are calculated for loans making reference Ihereto.

Prior to the Conversion Dale, the effective Interest rate applicable to the Borrower's

loans evidenced hereby shall change on the date of each change in the Prime Rate.

This Note is secured by ail collateral granted to the Bank by the Borrower or any

endorser or guarantor hereof or by any other party and shall be secured by any additional

collateral hereafter granted to the Bank by the Borrower or any endorser or guarantor hereof or

by any other party.

Principal and interest shall be payable at the Bank's main office or at such other

place as the Bank may designate in writing in immediately available funds in lawful money of

the United States of America without set-off, deduction or counterclaim, interest shall be

calculated on the basis of actual (0 number of days elapsed and a 360-day year.

This Note may be prepaid in whole or in part upon thirty (30) days prior written notice

to the Bank.

In the event of any prepayment of this Note after the Conversion Date, whether by voluntary

prepayment, acceleration or otherwise, the Borrower shall, at the option of the Bank, pay a

“fixed rate prepayment charge" equal to the product of: (a) the principal amount prepaid and

(b) the percentage set forth In the table below for any prepayment made during the indicated

period. "Conversion Year" shall mean each one year period commencing on the Conversion Date or

on any anniversary of the Conversion Date.

Percentage

Conversion Year 1 Conversion Year 2 Conversion Year 3 Conversion Year 4 Conversion Year 5

After the last period indicated in the above table this Note may be prepaid in whole or

in part without any prepayment charge. Notwithstanding anything to the contrary contained

herein, no “fixed ratei prepayment charge” will be assessed if the prepaid amount to be applied

to the Note is derived wholly from the Borrower's own funds. However, should the Borrower

choose to refinance the Note with another financial institution the above referenced "fixed

rate prepayment charge" will be assessed for the period in which the Note was prepaid.

At the option of the Bank, this Note shall become immediately due and payable without

notice or demand upon the occurrence at any time of any of the following events of default

(each, an "Event of Default"): (1) default of any liability, obligation, covenant or

undertaking of the Borrower, any endorser or any guarantor hereof to the Bank, hereunder or

otherwise, including, without limitation, failure to pay in full and when due any Installment

of principal or interest or default of the Borrower, any endorser or any guarantor hereof under

any other loan document delivered by the Borrower, any endorser or any guarantor, or in

connection with the ioan evidenced by this Note or any other agreement by the Borrower, any

endorser or any guarantor with the Bank; (2) failure of the Borrower, any endorser or any

guarantor hereof to maintain aggregate collateral security value satisfactory to the Bank; (3)

default of any material liability, obligation or undertaking of the Borrower, any endorser or

any guarantor hereof to any other party; (4) if any statement, representation or warranty

heretofore, now or hereafter made by the Borrower, any endorser or any guarantor hereof in

connection with the loan evidenced by this Note or In any supporting financial statement of the

Borrower, any endorser or any guarantor hereof shall be determined by the Bank to have been

false or misleading in any material respect when made; (5) if the Borrower, any endorser or any

guarantor hereof is a corporation, trust, partnership or limited iiabSily company, the

liquidation, termination or dissolution of any such organization, or the merger or

consolidation of such organizaiion into another entity, or its ceasing to carry on actively its

present business or the appointment of a receiver for its properly; (6) the death of the

Borrower, any endorser or any guarantor hereof and, if the Borrower, any endorser or any

guarantor hereof is a partnership or limited liability company, the death of any partner or

member; (7) the institution by or against the Borrower, any endorser or any guarantor hereof of

any proceedings under the Bankruptcy Code 11 USC §101 ef sec/, or any other law In which the

Borrower, any endorser or any guarantor hereof is alleged to be insolvent or unable to pay Its

debts as they mature, or the making by the Borrower, any endorser or any guarantor hereof of an

assignment for the benefit of creditors or the granting by the Borrower, any endorser or any

guarantor hereof of a trust mortgage for the benefit of creditors; (8) (he service upon the

Bank of a writ in which the Bank Is named as trustee of the Borrower, any endorser or any

guarantor hereof; (9) a judgment or judgments for the payment of money shall be rendered

against the Borrower,

any endorser or any guarantor hereof, and any such judgment shat! remain unsatisfied and in

effect for any period of thirty (30) consecutive days without a stay of execution; (10) any

levy, lien (including mechanics lien) except as permitted under any of the other ioan documents

between the Bank and the Borrower, seizure, attachment, execution or similar process shall be

issued or levied on any of the property of the Borrower, any endorser or any guarantor hereof;

(11) the termination or revocation of any guaranty hereof; or (12) the occurrence of such a

change in the condition or affairs (financial or otherwise) of the Borrower, any endorser or

any guarantor hereof, or the occurrence of any other event or circumstance, such that the Bank,

In its sole discretion, deems that it is insecure or that the prospects for timely or fuii

payment or performance of any obligation of the Borrower, any endorser or any guarantor hereof

to the Bank has been or may be Impaired,

Any payments received by the Bank on account of this Note shall, at the Bank's option,

be applied first, to accrued and unpaid interest; second, to the unpaid principal balance

hereof; third to any costs, expenses or charges then owed to the Bank by the Borrower; and the

balance to escrows, if any. Notwithstanding the foregoing, any payments received after (he

occurrence and during the continuance of

an Event of Default shall be applied in such manner as the Bank may determine, The Borrower

hereby authorizes the Bank to charge any deposit account which the Borrower may maintain with

the Bank for any payment required hereunder without prior notice to the Borrower.

If pursuant to the terms of this Note, the Borrower is at any time obligated to pay

interest on the principal balance at a rate In excess of the maximum interest rate permitted by

applicable law for the loan evidenced by this Note, the applicable interest rate shall be

immediately reduced to such maximum rate and all previous payments in excess of the maximum

rate shall be deemed to have been payments In reduction of principal and not on account of the

interest due hereunder.

The Borrower represents to the Bank that the proceeds of this Note will not be used

for personal, family or household purposes or for the purpose of purchasing or carrying margin

stock or margin securities within the meaning of Regulations U and X of the Board of Governors

of the Federal Reserve System, 12 C.F.R. Parts 221 and 224.

The Borrower and each endorser and guarantor hereof grant to the Bank a continuing

lien on and security interest in arty and all deposils or oilier sums at any time credited by

or due from the Bank or any Bank Affiliate (as hereinafter defined) to the Borrower and/or each

endorser or guarantor hereof and any cash, securities, instruments or other property of the

Borrower and each endorser and guarantor hereof In the possession of the Bank or any Bank

Affiliate, whether for safekeeping or otherwise, or in transit to or from She Bank or any Bank

Affiliate (regardless of the reason the Bank or Bank Affiliate had received the same or whether

the Bank or Bank Affiliate has conditionally released the same) as security for the full and

punctual payment and performance of all of the liabilities and obligations of ihe Borrower

and/or any endorser or guarantor hereof to the Bank or any Bank Affiliate and such deposits and

other sums may be applied or set off against such liabilities and obligations of (he Borrower

or any endorser or guarantor hereof to the Bank or any Bank Affiliate at any time, whether or

not such are then due, whether or not demand has been made and whether or not other collateral

is then available to the Bank or any Bank Affiliate.

No delay or omission on the part of the Bank In exercising any right hereunder shall

operate as a waiver of such right or of any other right of the Bank, nor shall any delay,

omission or waiver on any one occasion be deemed a bar to or waiver of the same or any other

right on any future occasion. The Borrower and every endorser or guarantor of this Note,

regardless of the time, order or place of signing, waive presentment, demand, protest, notice

of intent to accelerate, notice of acceleration and all other notices of every kind in

connection with ihe delivery, acceptance, performance or enforcement of this Note and assent to

any extension or postponement of the time of payment or any other indulgence, to any

substitution, exchange or release of collateral, and to the addition or release of any other

party or person primarily or secondarily liable and waives all recourse to suretyship and

guarantor defenses generally, including any defense based on Impairment of collateral. To the

maximum extent permitted by law, the Borrower and each endorser and guarantor of this Note

waive and terminate any homestead rights and/or exemptions respecting any premises under the

provisions of any applicable homestead

code:

import re

inputFile = open("/Users/ankit/Desktop/ml.txt","r")

completeText = re.sub(r"[^a-zA-Z0-9]+", ' ', inputFile.read())

numberList = ""

l = len(numberList)

for text in completeText.split(' '):

try:

if(text!=""):

numberList = numberList + re.sub(r"[^0-9]+","",text)

if(len(numberList)>l):

numberList += " "

l = len(numberList)

except ValueError:

pass

#print(text)

print(numberList)