# Lecture Notes:Week 4

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## Magic Square[edit]

### Algorithm for creating Magic Sqaure[edit]

*1: For getting 1 placed at position cell ==> (n/2 , n-1) i.e (1,2)*

```
2: (i,j) ==> (i-1 , j+1)            # i and j are index value of 1
3: if (i -1) Then  i = n-1         #n = matrix
4: if j = n Then j = 0
5: If position is already occupied ==> (i = i+1 , j=j-2)
6: If (i = -1 and j=n) Then (i = 0 , j=n-2)
```

### Python Program[edit]

*n = int(input())*

```
MagicSquare = []
```

```
for i in range(n):
  l=[]
  for j in range(n):
     l.append(0)
  matrix.append(l)
```
*count =1*

```
i = n // 2
j = n-1
```
*while count<= (n*n):*

```
 if i == -1 and j ==n:
   i = 0
   j=n-2
 else:
   if i == -1:
     i = n-1
   if j == n:
     j = 0
 if MagicSquare[i][j] != 0:
   i += 1
   j = j -2
 else:
   MagicSquare [i][j] = count
   count+=1


 i = i -1
 j +=1
```
*for i in range(n):*

```
for j in range(n):
  print(MagicSquare[i][j], end="")
print()
```

## This is the History of Magic Square[edit]

# Spot The Similarity[edit]

## Program for Spot The Similarity[edit]

```
#Dobble-game
import random

import string


#list of symbols
symbols=list(string.ascii_letters)


#initializing two cards
card1=[0]*10

card2=[0 for i in range(10)]


#determine same_symbol position
pos1=random.randrange(0,5)

pos2=random.randrange(0,5)


#selecting samesymbol
samesymbol=random.choice(symbols)


#removing samesymbol from list
symbols.remove(samesymbol)


#inserting samesymbol to the cards
```

```
card1[pos1]=card2[pos2]=samesymbol

#filling the two cards with each different unique symbol
i=0

while i<10:

    #selecting two symbols for two cards and removing each of them from list
    if(i!=pos1):
        alpha1=random.choice(symbols)
        symbols.remove(alpha1)
        card1[i]=alpha1
    if(i!=pos2):
        alpha2=random.choice(symbols)
        symbols.remove(alpha2)
        card2[i]=alpha2
    i+=1
#shuffling the cards(not relevent here,just for practice)
card1=random.sample("".join(card1),len(card1))

card2=random.sample("".join(card2),len(card2))

print(card1,"\n\n",card2)

if(samesymbol==input("Spot the similarity between the above two cards: ")):

    print("Right answer!!!")
else:

    print("Oops!! You are wrong.... {} is similar in the above two cards.".format(samesymbol))
```

## Birthday Paradox[edit]

## Program for Birthday Paradox[edit]

1. *Birthday paradox-Find your twin*

```
import random

import datetime

def isleap(y):

   return not y%400 or not y%4 and y%100
def create_bday():

   year=random.randint(1800,2020)
   month=random.randint(1,12)
   if(month>7):
       if(month%2):date=random.randrange(1,31)
       else:date=random.randint(1,31)
   else:
       if(month%2):date=random.randint(1,31)
       else:
           if(month==2):
               if(isleap(year)):date=random.randrange(1,30)
               else:date=random.randint(1,28)
           else:date=random.randrange(1,31)
   return [date,month,year]


#main() starts here
birthdays=[create_bday() for i in range(int(input("Enter number of birthdays:")))]

doy_list=[] #list that holds date_of_year of each bday

#calculating day_of_the_year for each birthday
```

```
for i in birthdays:

    dd=datetime.date(i[2],i[1],i[0]) #return date format; datetime.date(year,month,day)
    day_of_year=dd.timetuple().tm_yday
    doy_list.append(day_of_year)
doy_list.sort()

print(*doy_list,sep="\n")
```

## Guess the Movie Name[edit]

### Program for Guess the Movie Name[edit]

```
import random movies=["anand","drishyam","nayak","gol maal","black friday","sholey","mard","dangal","bahubali","taare Zameen par"]

def create_question(movie):

    n=len(movie)
    letters=list(movie)
    temp=[]
    for i in range(n):
        if (letters==' '):
            temp.append(' ')
        else:
            temp.append('*')
    qn=.join(str(x) for x in temp)
    return qn

def is_present(letter,movie):

    c=movie.count(letter)
    if (c==0):
```

```
        return False
    else:
        return True
```
*def unlock(qn,movie,letter):*

```
    ref=list(movie)
    qn_list=list(qn)
    temp=[]
    n=len(movie)
    for i in range(n):
        if(ref[i]==' ' or ref[i]==letter):
            temp.append(ref[i])
        else:
            if(qn_list[i]=='*'):
                temp.append('*')
            else:
                temp.append(ref[i])
    qn_new=.join(str(x) for x in temp)
    return qn_new
```
*def play():*

```
    p1name=input("Player 1! Please enter your name: ")
    p2name=input("Player 2! Please enter your name: ")
    pp1=0
    pp2=0
    turn=0
    willing=True
    while willing:
```

```
    if (turn%2==0):
        #plyer 1
        print(p1name,"Your turn")
        picked_movie=random.choice(movies)
        qn=create_question(picked_movie)
        print(qn)
        modified_qn=qn
        not_said=True
        while not_said:
            letter=input("Your letter: ")
            if (is_present(letter,picked_movie)):
                #unlock
                modified_qn=unlock(modified_qn,picked_movie,letter)
                print(modified_qn)
                d=int(input("Press 1 to guess the movie or 2 to another letter"))
                if(d==1):
                    ans=input("Your answer: ")
                    if (ans==picked_movie):
                        pp1=pp1+1
                        print("Correct")
                        not_said=False
                        print(p1name,"Your score: ",pp1)
                    else:
                        print("Wrong answer. Try again.")
            else:
                print(letter," not found.")
        c=int(input("press 1 to continue or 0 to quit."))
```

```
        if (c==0):
            print(p1name,"Your score: ",pp1)
            print(p2name,"Your score: ",pp2)
            print("Thanks for playing.")
            print("Have a nice day.")
            willing=False
    else:
        #player 2
        print(p1name,"Your turn")
        picked_movie=random.choice(movies)
        qn=create_question(picked_movie)
        print(qn)
        modified_qn=qn
        not_said=True
        while not_said:
            letter=input("Your letter: ")
            if (is_present(letter,picked_movie)):
                #unlock
                modified_qn=unlock(modified_qn,picked_movie,letter)
                print(modified_qn)
                d=int(input("Press 1 to guess the movie or 2 to another letter"))
                if (d==1):
                    ans=input("Your answer: ")
                    if (ans==picked_movie):
                        pp1=pp1+1
                        print("Correct")
                        not_said=False
```

```
                        print(p1name,"Your score: ",pp1)
                    else:
                        print("Wrong answer. Try again.")
            else:
                print(letter," not found.")
        c=int(input("press 1 to continue or 0 to quit."))
        if (c==0):
            print(p1name,"Your score: ",pp1)
            print(p2name,"Your score: ",pp2)
            print("Thanks for playing.")
            print("Have a nice day.")
            willing=False
    turn=turn+1
```

*play()*