### AIM'S

Program to construct a Benjusian network contrating medical data.

Use thus model to demonstrate the diagnosis of heart patients using abandard years niveous, believes.

### Algorithm:

- 1. Edentify the variables which is bet of authibutes in the doctaret
- 2. Determine the alomain to of each variable that is very of values a vointable may take
- 3. Creat a directed grouph network of nodes where tout node represents the attribute and edges represent parent chief relationstrip, edge represents that the chief variable is conductionally dependent on the parent.
- & octument the prior and condettioned probability for each attribute
- 5. Desposes the injuscie on the model & determine the marginal

# Dataset: heart\_duscare\_data. Lsv.

Age	Gender.	Family Hintory	Ovet	Lifestyle	Unolestrol	heart
SuperSenior Utizen.	Mode	Yes	Medwan.	Sidelary	letigh	Yes
buper 8 enior citizen	Female	405	Medour	sedetary	etigh.	Yes
	rade	No	myh	Moderate	Bordertene	yes
servior artizen	Mode	Les	meduren	Sedieary	normal	100
Teen Youth.	Pernale	Yes	141.01/	Athlete	Normal	NO
middle Aged	pade	40)	Medoum	Activic	High	403
Teen	pale	405	High	Moderate	MAN	Yes
dupers coiox citazen.	House	405	nedun	sederary	ingh	yes.
youth.	Pernall.	Yes	High.	photose	normal	No
	remale.	No	High	athlete	normal	443
Servox Whozen.	periode	NO	midwin	moderate	map.	Yes
Teen	Male	yes.	medium	Seditary	normal	100
tun	Female	No.	ingh	Athlete	ungh	NO
Middle Aged	Male	Yes,	Moloum.	Actions	whigh.	ves

Age	Gender	Famolythutory	Diet	uzestyle	Cholestrol	Heart organi
Youth	Pemale	rus	ungh	Ath letc	Box durtione	No
Kuper servor Lotizen	male	yes 🕠	. uvgh	Athlese	Dormal	eus -
servorcohozar	rimale	No	Medourn	Moderan	Bordehine	Yes
Youth.	Perrole	44	Medvun	Athlete	Bordestene	so.
Teen	Male	Hes.	Medaum	Seddary	Normal	<b>1840</b>

## Program:

import bayopy as olp

umport numpy on up

umpost usu.

from colotana ampost init

from colorana import Fores Back,

(hctc)

agetnum = { buppersentor Entryen': 0, 'servor Cett'zen': 1, 'middle Aged': 2, 'Youth': 3, 'Teen': 43

gender Enum = 3 'Male': 0, 'Fernale': 13

family History Frien = & yes 1:0, 'No': 2 3

oliettenium = { 'High': 0, ' medocem': 1, 'Low': 2}

difestyle Grunn = f'Athleti: 0, 'Active': 1, 'Moderate': 2, 'Scolchary': 34.

cholisterolonum > & 'bligh': 0, Bordessenc': 1, Normal': 23

meast mineare Green: & 'res': 0, '00': 1 },

with open ('near-dineare\_data. vsv') or esuffile: denci= Qsv. reader (Esuffile) datante vert (lener) data=[7]

for x in doctoret:

data append ([ages-num[x[o]], gendersnum[x[i]], Jamury History Sneum[x[o]], duct sneum[x[o]], lightly les num [x[vi]], cholast to lenum [x[o]], heart Divisur (sneum [x[o]])

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N= un (data)
Page = p. nodes. airventet (1.0 = np..ones(5))
 age = bp. nodes. largonieal (p_age, plara = (N,)) age . observe (datel:, &])
 P-gender = top. nodes. Dimenter (1.0 + np. ones (2)) gender = top. nodes. Coregonical (p. gender,
   pratur= (10,1) gerder. observe (data [:,1])
p-parnityhustory = dp. nodes. Ornichlet (1.0 + np. ones (2)) damilyhustory = dep. nodes.
  categorical (P-farminghostory, places: (N, )) samply hostory. dos cove (douta[:,2])
         bp. nodes. anichile (1.0 * np. ones (3)) diet = olp. nucles. categorical (protect,
 places = (N, 1) duct observe (data [1, 5])
p_lijesty1 = &p. nades. Distrebles (1.0 + np. ones (4)) lijestyle = bp. nades, Categorical
  (p_cholestrol, planes= (N1)) cholesterol. observe (data[:,5])
 p-heart-dureaux = bep-nodes. Derichlet (np. ones(2), plates = (5,212,3,413))
meardurence = bp. noder . multituryper ( [age, gender, domerypurtory, duet, legestyle,
  cholestrol J, bp. nodes. lategonical, p- heartduncase)
 heartdineare, observe (doug[:,6])
  P-heartolineare. Update ()
 raming theter= us, overentable = Medicin, lightlyne = Seditory, Cholistrol = High)")
 family the tory Erum ['44.], det Erum ['Medium 1], wis style Erum ['seduary'],
  cholisterol Frum [+ stigh 1], bp. nools. catgorial, p. hearidineare]. get_moments ()
  [0] [heartons care Encom [4cs ]]).
  while m== 0%
         part ("10")
         res = bp. nodes. Multimixture ([int (input ('Enter Age? + wit (age@num)))),
          ent (input ('Enter Gender: ' + stor (gender Enum))), int (input ('Enter
```

family Hintory! ' + str (famoly Hunory Encor))), int (input ('Enter

diet Enum: " + Btr (diet Ensum))), unt (input ('Entex ligestyre: 1' +

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the roder (argonical, p_heartowneard). get moments () [o] [heartowneard (ver])

munt ("probabilisty (Heartowneard) = " + sety (tes))

m= int (unput ("Enter for continue", Evert: 1"))
```

### output:

```
Enter Age: y{'SuperSeniorCitizen': 0, 'SeniorCitizen': 1, 'MiddleAged': 2, 'Youth': 3, 'Teen': 4}1
Enter Gender: {'Male': 0, 'Female': 1}1
Enter FamilyHistory: {'Yes': 0, 'No': 1}1
Enter dietEnum: {'High': 0, 'Medium': 1, 'Low': 2}2
Enter LifeStyle: {'Athlete': 0, 'Active': 1, 'Moderate': 2, 'Sedetary': 3}2
Enter Cholesterol: {'High': 0, 'BorderLine': 1, 'Normal': 2}1
Probability(HeartDisease) = 0.5
Enter for Continue:0, Exit :1 0

Enter Age: y{'SuperSeniorCitizen': 0, 'SeniorCitizen': 1, 'MiddleAged': 2, 'Youth': 3, 'Teen': 4}0
Enter Gender: {'Male': 0, 'Female': 1}0
Enter FamilyHistory: {'Yes': 0, 'No': 1}0
Enter dietEnum: {'High': 0, 'Medium': 1, 'Low': 2}0
Enter LifeStyle: {'Athlete': 0, 'Active': 1, 'Moderate': 2, 'Sedetary': 3}3
Enter Cholesterol: {'High': 0, 'BorderLine': 1, 'Normal': 2}0
Probability(HeartDisease) = 0.5
Enter for Continue:0, Exit :1
```