**ASSIGNMENT NO.**

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CLASS: BE COMP-1 ROLL NO.: 402055

**PROGRAM:**

#include<iostream>

using namespace std;

typedef struct table

{

int id;

int age;

int income;

bool student;

int credit;

bool buycomp;

}t1;

int main()

{

int rno;

char ch;

cout<<"\n Enter number of records in the table : ";

cin>>rno;

t1 \*X=new t1[rno];

for(int i=0;i<rno;i++)

{

cout<<"\n Enter record for id "<<i+1<<" of table : \n";

X[i].id=i+1;

do

{

cout<<"\n Age : 1.Infant 2.Young 3.Old\n Enter : ";

cin>>X[i].age;

if(X[i].age>3 || X[i].age<1)

{

cout<<"\n Please enter correct age..\n";

}

}while(X[i].age>3 || X[i].age<1);

do

{

cout<<"\n Income: 1.High 2.Medium 3.Low\n Enter : ";

cin>>X[i].income;

if(X[i].income>3 || X[i].income<1)

{

cout<<"\n Please enter corect income..\n";

}

}while(X[i].income>3 || X[i].income<1);

cout<<"\n Whether the person is student? 1.Yes 0.No\n Enter : ";

cin>>X[i].student;

do

{

cout<<"\n Credit Ratings:1.Low 2.Fair 3.High\n Enter : ";

cin>>X[i].credit;

if(X[i].credit>3 || X[i].credit<1)

{

cout<<"\n Please enter correct credit ratings..";

}

}while(X[i].credit>3 || X[i].credit<1);

cout<<"\n Whether the person buys the computer? 1.Yes 0.No\n Enter : ";

cin>>X[i].buycomp;

}

cout<<"| ID\t| Age\t| Income|Student| Credit Rating | Buy\t|\n";

cout<<"----------------------------------------------------------";

for(int i=0;i<rno;i++)

{

cout<<"\n| "<<X[i].id<<"\t| ";

switch(X[i].age)

{

case 1:cout<<"Infant| ";break;

case 2:cout<<"Young\t| ";break;

case 3:cout<<"Old\t| ";break;

}

switch(X[i].income)

{

case 1:cout<<"Low\t| ";break;

case 2:cout<<"Medium| ";break;

case 3:cout<<"High\t| ";break;

}

if(X[i].student)

{

cout<<"Yes\t| ";

}

else

{

cout<<"No\t| ";

}

switch(X[i].credit)

{

case 1:cout<<"Low\t\t| ";break;

case 2:cout<<"Fair\t\t| ";break;

case 3:cout<<"High\t\t| ";break;

}

if(X[i].buycomp)

{

cout<<"Yes\t| ";

}

else

{

cout<<"No\t| ";

}

}

int yes=0,no=0;

for(int i=0;i<rno;i++)

{

if(X[i].buycomp)

{

yes++;

}

else

{

no++;

}

}

float pbyes=(float)yes/rno,pbno=(float)no/rno;

cout<<"\n\n P(buy Computer = Yes) = "<<pbyes<<endl;

cout<<" P(buy Computer = No) = "<<pbno<<endl;

int c,f,t,tf,pn=0,pno=0;

float py[20],pn1[20],s;

do

{

t=0;

cout<<"\n Enter selection critera for conditional probability : \n";

cout<<"\n 1.Buy Computer \n 0.Not Buy Computer : ";

cin>>tf;

cout<<"\n 1.Age 2.Income 3.Student 4.Credit Rating : ";

cin>>c;

switch (c)

{

case 1:

do

{

cout<<"\n Enter Field of Age: 1.Infant 2.Young 3.Old : ";

cin>>f;

}while(f>3 || f<1);

for(int i=0;i<rno;i++)

{

if(X[i].age==f && X[i].buycomp==tf)

{

t++;

}

}

(tf==1)?s=py[pn++]=(float)t/yes:s=pn1[pno++]=(float)t/no;

switch(f)

{

case 1:cout<<" P(Age = Infant | buys Computer = ";

(tf==1)?cout<<"Yes":cout<<"No";

cout<<") = "<<s<<endl;

break;

case 2:cout<<" P(Age = Young | buys Computer = ";

(tf==1)?cout<<"Yes":cout<<"No";

cout<<") = "<<s<<endl;

break;

case 3:cout<<" P(Age = Old | buys Computer = ";

(tf==1)?cout<<"Yes":cout<<"No";

cout<<") = "<<s<<endl;

break;

}

break;

case 2:

do

{

cout<<"\n Enter Field of Income: 1.High 2.Medium 3.Low : ";

cin>>f;

}while(f>3 || f<1);

for(int i=0;i<rno;i++)

{

if(X[i].income==f && X[i].buycomp==tf)

{

t++;

}

}

(tf==1)?s=py[pn++]=(float)t/yes:s=pn1[pno++]=(float)t/no;

switch(f)

{

case 1:cout<<" P(Income = High | buys Computer = ";

(tf==1)?cout<<"Yes":cout<<"No";

cout<<") = "<<s<<endl;

break;

case 2:cout<<" P(Income = Medium | buys Computer = ";

(tf==1)?cout<<"Yes":cout<<"No";

cout<<") = "<<s<<endl;

break;

case 3:cout<<" P(Income = Low | buys Computer = ";

(tf==1)?cout<<"Yes":cout<<"No";

cout<<") = "<<s<<endl;

break;

}

break;

case 3:

do{

cout<<"\n Enter field of Student: 1.Yes 0.No : ";

cin>>f;

}while(f>=1 && f<=0);

for(int i=0;i<rno;i++)

{

if(X[i].student==f && X[i].buycomp==tf)

{

t++;

}

}

(tf==1)?s=py[pn++]=(float)t/yes:s=pn1[pno++]=(float)t/no;

switch(f){

case 1:cout<<" P(Student = Yes | buys Computer = ";

(tf==1)?cout<<"Yes":cout<<"No";

cout<<") = "<<s<<endl;

break;

case 0:cout<<" P(Student = No | buys Computer = ";

(tf==1)?cout<<"Yes":cout<<"No";

cout<<") = "<<s<<endl;

break;

}

break;

case 4:

do

{

cout<<"\n Enter Field of Credit Ratings: 1.Low 2.Fair 3.High : ";

cin>>f;

}while(f>3 || f<1);

for(int i=0;i<rno;i++)

{

if(X[i].credit==f && X[i].buycomp==tf)

{

t++;

}

}

(tf==1)?s=py[pn++]=(float)t/yes:s=pn1[pno++]=(float)t/no;

switch(f)

{

case 1:cout<<" P(Credit Ratings = Low | buys Computer = ";

(tf==1)?cout<<"Yes":cout<<"No";

cout<<") = "<<s<<endl;

break;

case 2:cout<<" P(Credit Ratings = Fair | buys Computer = ";

(tf==1)?cout<<"Yes":cout<<"No";

cout<<") = "<<s<<endl;

break;

case 3:cout<<" P(Credit Ratings = High | buys Computer = ";

(tf==1)?cout<<"Yes":cout<<"No";

cout<<") = "<<s<<endl;

break;

}

break;

default:

break;

}

t=0;

cout<<"\n Press Y for more conditional probabilities : ";

cin>>ch;

}while(ch=='y'||ch=='Y');

float fproy=1,fpron=1;

for(int i=0;i<pn;i++){

fproy=fproy\*py[i];

}

cout<<"\n P(X | buys Computer = Yes) = "<<fproy<<endl;

fproy=fproy\*pbyes;

for(int i=0;i<pno;i++){

fpron=fpron\*pn1[i];

}

cout<<" P(X | buys Computer = No) = "<<fpron<<endl;

fpron=fpron\*pbno;

cout<<"\n P(buys Computer = Yes) = "<<fproy<<endl;

cout<<" P(buys Computer = No) = "<<fpron<<endl;

return 0;

}

**OUTPUT :**

rohit@ubuntu:~$ g++ bayes.cpp

rohit@ubuntu:~$ ./a.out

Enter number of records in the table : 10

Enter record for id 1 of table :

Age : 1.Infant 2.Young 3.Old

Enter : 2

Income: 1.High 2.Medium 3.Low

Enter : 3

Whether the person is student? 1.Yes 0.No

Enter : 1

Credit Ratings:1.Low 2.Fair 3.High

Enter : 2

Whether the person buys the computer? 1.Yes 0.No

Enter : 1

Enter record for id 2 of table :

Age : 1.Infant 2.Young 3.Old

Enter : 2

Income: 1.High 2.Medium 3.Low

Enter : 2

Whether the person is student? 1.Yes 0.No

Enter : 1

Credit Ratings:1.Low 2.Fair 3.High

Enter : 2

Whether the person buys the computer? 1.Yes 0.No

Enter : 1

Enter record for id 3 of table :

Age : 1.Infant 2.Young 3.Old

Enter : 3

Income: 1.High 2.Medium 3.Low

Enter : 3

Whether the person is student? 1.Yes 0.No

Enter : 0

Credit Ratings:1.Low 2.Fair 3.High

Enter : 3

Whether the person buys the computer? 1.Yes 0.No

Enter : 0

Enter record for id 4 of table :

Age : 1.Infant 2.Young 3.Old

Enter : 1

Income: 1.High 2.Medium 3.Low

Enter : 1

Whether the person is student? 1.Yes 0.No

Enter : 1

Credit Ratings:1.Low 2.Fair 3.High

Enter : 1

Whether the person buys the computer? 1.Yes 0.No

Enter : 1

Enter record for id 5 of table :

Age : 1.Infant 2.Young 3.Old

Enter : 3

Income: 1.High 2.Medium 3.Low

Enter : 2

Whether the person is student? 1.Yes 0.No

Enter : 0

Credit Ratings:1.Low 2.Fair 3.High

Enter : 3

Whether the person buys the computer? 1.Yes 0.No

Enter : 0

Enter record for id 6 of table :

Age : 1.Infant 2.Young 3.Old

Enter : 2

Income: 1.High 2.Medium 3.Low

Enter : 3

Whether the person is student? 1.Yes 0.No

Enter : 0

Credit Ratings:1.Low 2.Fair 3.High

Enter : 1

Whether the person buys the computer? 1.Yes 0.No

Enter : 1

Enter record for id 7 of table :

Age : 1.Infant 2.Young 3.Old

Enter : 3

Income: 1.High 2.Medium 3.Low

Enter : 1

Whether the person is student? 1.Yes 0.No

Enter : 1

Credit Ratings:1.Low 2.Fair 3.High

Enter : 2

Whether the person buys the computer? 1.Yes 0.No

Enter : 1

Enter record for id 8 of table :

Age : 1.Infant 2.Young 3.Old

Enter : 1

Income: 1.High 2.Medium 3.Low

Enter : 3

Whether the person is student? 1.Yes 0.No

Enter : 0

Credit Ratings:1.Low 2.Fair 3.High

Enter : 3

Whether the person buys the computer? 1.Yes 0.No

Enter : 1

Enter record for id 9 of table :

Age : 1.Infant 2.Young 3.Old

Enter : 2

Income: 1.High 2.Medium 3.Low

Enter : 1

Whether the person is student? 1.Yes 0.No

Enter : 1

Credit Ratings:1.Low 2.Fair 3.High

Enter : 2

Whether the person buys the computer? 1.Yes 0.No

Enter : 1

Enter record for id 10 of table :

Age : 1.Infant 2.Young 3.Old

Enter : 1

Income: 1.High 2.Medium 3.Low

Enter : 2

Whether the person is student? 1.Yes 0.No

Enter : 1

Credit Ratings:1.Low 2.Fair 3.High

Enter : 1

Whether the person buys the computer? 1.Yes 0.No

Enter : 0

| ID | Age | Income |Student| Credit Rating | Buy |

----------------------------------------------------------

| 1 | Young | High | Yes | Fair | Yes |

| 2 | Young | Medium | Yes | Fair | Yes |

| 3 | Old | High | No | High | No |

| 4 | Infant | Low | Yes | Low | Yes |

| 5 | Old | Medium | No | High | No |

| 6 | Young | High | No | Low | Yes |

| 7 | Old | Low | Yes | Fair | Yes |

| 8 | Infant | High | No | High | Yes |

| 9 | Young | Low | Yes | Fair | Yes |

| 10 | Infant | Medium | Yes | Low | No |

P(buy Computer = Yes) = 0.7

P(buy Computer = No) = 0.3

Enter selection critera for conditional probability :

1.Buy Computer

0.Not Buy Computer : 1

1.Age 2.Income 3.Student 4.Credit Rating : 1

Enter Field of Age: 1.Infant 2.Young 3.Old : 2

P(Age = Young | buys Computer = Yes) = 0.571429

Press Y for more conditional probabilities : Y

Enter selection critera for conditional probability :

1.Buy Computer

0.Not Buy Computer : 1

1.Age 2.Income 3.Student 4.Credit Rating : 3

Enter field of Student: 1.Yes 0.No : 1

P(Student = Yes | buys Computer = Yes) = 0.714286

Press Y for more conditional probabilities : Y

Enter selection critera for conditional probability :

1.Buy Computer

0.Not Buy Computer : 0

1.Age 2.Income 3.Student 4.Credit Rating : 4

Enter Field of Credit Ratings: 1.Low 2.Fair 3.High : 1

P(Credit Ratings = Low | buys Computer = No) = 0.333333

Press Y for more conditional probabilities : N

P(X | buys Computer = Yes) = 0.408163

P(X | buys Computer = No) = 0.333333

P(buys Computer = Yes) = 0.285714

P(buys Computer = No) = 0.1

rohit@ubuntu:~$