Práctica 5. GENIE como herramienta de ayuda al diagnóstico

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Índice

Ín	dice general	1
1.	Enunciado	2
	Ejercicio 1 2.1. Solución	2
3.	Ejercicio 2 3.1. Solución	3
	Ejercicio Opcional 4 1 Solución	9

1. Enunciado

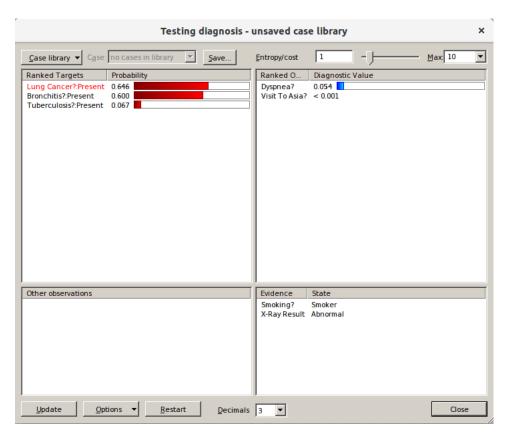
Tarea: Resuelve los ejercicios propuestos.

Entrega: Documento pdf con la solución (capturas de pantalla y textos descriptivos)

2. Ejercicio 1

En el ejemplo del tutorial, diagnostica ahora el caso de un paciente que tiene un resultado de la prueba anormal y que fuma. Captura la pantalla de las enfermedades, y explica cual es ahora la enfermedad más probable para este paciente.

2.1. Solución



Lo más probable es que el paciente tenga cáncer de pulmón, aunque la probabilidad de que solo sea bronquitis no es mucho menor (casi $65\,\%$ de cáncer contra $60\,\%$ de bronquitis.)

3. Ejercicio 2

Carga la red Hepar-II que encontrarás en la carpeta Examples (dentro del directorio en el que esté GeNIe) y responde a las siguientes preguntas:

- a) ¿Qué nodos se han seleccionado como nodos objetivo? ¿Y cómo nodos auxiliares? ¿A qué nodos se les ha asignado el subtipo "Ranked"? Y de estos nodos etiquetados como "Ranked" ¿qué estados se han seleccionado como objetivos? (Nota: utiliza la vista "Spreadsheet")
- b) Utiliza la ventana de diagnóstico para estudiar las siguientes situaciones: supongamos un paciente que tiene alto el colesterol total (a999_350) y los triglicéridos totales (a17_4). ¿Cuál es la enfermedad que tiene mayor probabilidad en el caso de que dicho paciente sea hombre, y con qué probabilidad la padece? ¿Y en el caso en que sea mujer?. ¿Qué prueba conviene realizarle a cada uno de ellos a continuación si se quiere demostrar que tiene dicha enfermedad? ¿Cuánto cambian las probabilidades si se realiza dicha prueba y se obtiene que el resultado es positivo?

3.1. Solución

a) ¿Qué nodos se han seleccionado como nodos objetivo? ¿Y cómo nodos auxiliares? ¿A qué nodos se les ha asignado el subtipo "Ranked"? Y de estos nodos etiquetados como "Ranked" ¿qué estados se han seleccionado como objetivos? (Nota: utiliza la vista "Spreadsheet")

Node Name	State Name	Special Name	Special Name	Node Id	State Id	Prior Probability	Cost	Туре	Ra	Ma	Tar	. Def
ALT				alt			0	Observation	V			
	a850_200				F113						Г	
	a199_100	"[F114							
	a99_35	1		1	F115							
	a34 0	1			F116						Г	Г
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	a700_400				F117		İ		1	İ	Г	
	a399 150	1		1	F118							Г
	a149 40	"		1	F119							Г
	a39_0	1		1	F120							Г
Age				age			0	Observation	₽			Ť
	age65_100		1		F27	0.0772532	1			1	Г	
	age51_65	1		1	F28	0.387697					Ė	Ė
	age31_50				F29	0.397711					Ė	Ė
	age0_30	"			F30	0.137339					Ė	Ė
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	a29 0	-			F149	-					Ė	Ť
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	absent				F96	-					_	Ė
Alkaline phosp	absent			phosphatase	150		0	Observation	✓			_
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	a699_240	-			F68	+					Ė	Ė
	a239_0			-	F69						-	÷
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	a299_0				F123						-	-
A	a233_0				F125		0	Observation	✓		,	
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	absent				F103							

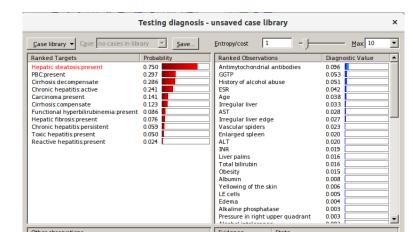
Node Name	State Name	Special Name	Special Name	Node Id	State Id	Prior Probability	Cost	Type	Ra	Ma	. Tar.	[
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	a39_0		}		F101						Ė	
	a33_0	To be a side and			1 101		-	T		-	-	÷
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	present	1	T T		F16	T				Ť Ť		Ť
	absent	-	}		F17						Ė	
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	compensate		Cirrhosis:comp		F42						M	4
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Diabetes				diabetes			0	Observation	✓			
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	present				F61							<u>.</u>
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	absent				F52						Ė	÷
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Node Name	State Name	Special Name	Special Name	Node Id	State Id	Prior Probability	Cost	Type	Ra	Ma	. Tar.	D
ratulence				flatulence			0	Observation	V			
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iatulence				flatulence			0	Observation	₹			ļ
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	absent	Inherited		flatulence Hyperbilirubin	F94		0	Observation Target	D		F	
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unctional hyp	absent present absent	Inherited	Functional hyp	Hyperbilirubin	F94 F44			Target	V	П	ا ت	
unctional hyp	absent present absent a640_70	Inherited	Functional hyp	Hyperbilirubin	F94 F44 F45 F124			Target	V	П		
unctional hyp	absent present absent a640_70 a69_30	Inherited	Functional hyp	Hyperbilirubin	F94 F44 F45 F124 F125			Target	V	П		
unctional hyp	absent present absent a640_70 a69_30 a29_10	Inherited	Functional hyp	Hyperbilirubin	F94 F44 F45 F124 F125 F126			Target	V	П		
unctional hyp	absent present absent a640_70 a69_30	Inherited	Functional hyp	Hyperbilirubin ggtp	F94 F44 F45 F124 F125		0	Target Observation	V			
unctional hyp	absent present absent a640_70 a69_30 a29_10	Inherited	Functional hyp	Hyperbilirubin	F94 F44 F45 F124 F125 F126 F127			Target	V	П		
unctional hyp	absent present absent a640_70 a69_30 a29_10	Inherited	Functional hyp	Hyperbilirubin ggtp	F94 F44 F45 F124 F125 F126	0.153076	0	Target Observation	V			
unctional hyp	absent present absent a640_70 a69_30 a29_10 a9_0 present	Inherited	Functional hyp	Hyperbilirubin ggtp	F94 F44 F45 F124 F125 F126 F127		0	Target Observation	V			
unctional hyp GTP	absent present absent a640_70 a69_30 a29_10 a9_0	Inherited	Functional hyp	ggtp gallstones	F94 F44 F45 F124 F125 F126 F127	0.153076 0.846924	0	Target Observation Observation	V			
unctional hyp GTP	absent present absent a640_70 a69_30 a29_10 a9_0 present absent	Inherited	Functional hyp	Hyperbilirubin ggtp	F94 F44 F45 F124 F125 F126 F127 F14 F15		0	Target Observation	V			
unctional hyp GTP	absent present absent a640_70 a69_30 a29_10 a9_0 present absent present	Inherited	Functional hyp	ggtp gallstones	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91		0	Target Observation Observation	V			
GTP Gallstones	absent present absent a640_70 a69_30 a29_10 a9_0 present absent	Inherited	Functional hyp	Hyperbilirubin ggtp gallstones bleeding	F94 F44 F45 F124 F125 F126 F127 F14 F15		0	Observation Observation Observation				
GTP Gallstones	absent present absent a640_70 a69_30 a29_10 a9_0 present absent present absent	Inherited	Functional hyp	ggtp gallstones	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92		0	Target Observation Observation	V			
GTP Gallstones	absent present absent a640_70 a69_30 a29_10 a9_0 present absent present	Inherited	Functional hyp	Hyperbilirubin ggtp gallstones bleeding	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91		0	Observation Observation Observation				
GTP Gallstones	absent present absent a640_70 a69_30 a29_10 a9_0 present absent present absent present	Inherited	Functional hyp	Hyperbilirubin ggtp gallstones bleeding	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92 F106		0	Observation Observation Observation				
iunctional hyp iGTP iallstones laemorrhagie	absent present absent a640_70 a69_30 a29_10 a9_0 present absent present absent	Inherited	Functional hyp	Hyperbilirubin ggtp gallstones bleeding hepatalgia	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92 F106 F107		0	Target Observation Observation Observation Observation				
iunctional hyp iGTP iallstones laemorrhagie	absent present absent a640_70 a69_30 a29_10 a9_0 present absent present absent present absent	Inherited	Functional hyp	Hyperbilirubin ggtp gallstones bleeding	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92 F106 F107		0	Observation Observation Observation				
iunctional hyp iGTP iallstones laemorrhagie	absent present absent a640,70 a69,30 a29,10 a9,0 present absent present absent present absent present absent	Inherited	Functional hyp	Hyperbilirubin ggtp gallstones bleeding hepatalgia	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92 F106 F107 F97		0	Target Observation Observation Observation Observation				
unctional hyp GGTP Gallstones laemorrhagie lepatalgia	absent present absent a640_70 a69_30 a29_10 a9_0 present absent present absent present absent		Functional hyp	Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92 F106 F107		0	Target Observation Observation Observation Observation Observation				
unctional hyp GGTP Gallstones laemorrhagie lepatalgia	absent present absent a640,70 a69,30 a29,10 a9,0 present absent present absent present absent present absent	Inherited	Functional hyp	Hyperbilirubin ggtp gallstones bleeding hepatalgia	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92 F106 F107 F97		0	Target Observation Observation Observation Observation				
unctional hyp GTP Gallstones laemorrhagie lepatalgia	absent present absent a640,70 a69,30 a29,10 a9,0 present absent present absent present absent present absent			Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy	F94 F44 F45 F124 F126 F127 F14 F15 F91 F92 F106 F107 F97 F98		0	Target Observation Observation Observation Observation Observation				
unctional hyp GTP Gallstones laemorrhagie lepatalgia	absent present absent a640_70 a69_30 a22_10 a9_0 present absent present absent present absent present absent present absent		Functional hyp	Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92 F106 F107 F97 F98 F33		0	Target Observation Observation Observation Observation Observation				
unctional hyp GTP Gallstones Ideamorrhagie Idepatalgia Idepatic encep Idepatic fibrosis	absent present absent a640,70 a69,30 a29,10 a9,0 present absent present absent present absent present absent	Inherited		Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy fibrosis	F94 F44 F45 F124 F126 F127 F14 F15 F91 F92 F106 F107 F97 F98		0	Target Observation Observation Observation Observation Observation Target				
unctional hyp GTP Gallstones Ideamorrhagie Idepatalgia Idepatic encep Idepatic fibrosis	absent present absent a640,70 a69_30 a29_10 a9_0 present absent present absent present absent present absent present absent		Hepatic fibrosi	Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92 F106 F107 F97 F98 F33 F34		0	Target Observation Observation Observation Observation Observation				
unctional hyp GTP Gallstones Ideamorrhagie Idepatalgia Idepatic encep Idepatic fibrosis	absent present absent a640_70 a69_30 a29_10 a9_0 present absent present absent present absent present absent present absent present absent present absent	Inherited		Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy fibrosis	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92 F106 F107 F97 F98 F33 F34 F39		0	Target Observation Observation Observation Observation Observation Target				
unctional hyp SGTP Sallstones Iaemorrhagie Iepatalgia Iepatic encep	absent present absent a640,70 a69_30 a29_10 a9_0 present absent present absent present absent present absent present absent	Inherited	Hepatic fibrosi	Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy fibrosis	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92 F106 F107 F97 F98 F33 F34		0	Target Observation Observation Observation Observation Observation Target				
unctional hyp GGTP Salistones Ideamorrhagie Idepatalgia Idepatic encep Idepatic fibrosis	absent present absent a640_70 a69_30 a29_10 a9_0 present absent present absent present absent present absent present absent present absent present absent	Inherited	Hepatic fibrosi	Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy fibrosis	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92 F106 F107 F97 F98 F33 F34 F39		0	Target Observation Observation Observation Observation Target Target				
unctional hyp GGTP Salistones Ideamorrhagie Idepatalgia Idepatic encep Idepatic fibrosis	absent present absent a640, 70 a69, 30 a22, 10 a9_0 present absent present absent present absent present absent present absent present absent present absent	Inherited	Hepatic fibrosi	Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy fibrosis	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92 F106 F107 F98 F33 F34 F39 F40		0	Target Observation Observation Observation Observation Observation Target				
unctional hyp GTP iallstones iaemorrhagie iepatalgia iepatic encep iepatic fibrosis	absent present absent a640,70 a69,30 a29,10 a9,0 present absent present absent present absent present absent present absent present absent present absent present absent	Inherited	Hepatic fibrosi	Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy fibrosis	F94 F44 F45 F124 F126 F127 F14 F15 F91 F92 F106 F107 F97 F98 F33 F33 F34 F39 F40 F104		0	Target Observation Observation Observation Observation Target Target				
unctional hyp iallstones laemorrhagie lepatalgia lepatic encep lepatic fibrosis lepatic steato	absent present absent a640, 70 a69, 30 a22, 10 a9_0 present absent present absent present absent present absent present absent present absent present absent	Inherited	Hepatic fibrosi	Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy fibrosis Steatosis	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92 F106 F107 F98 F33 F34 F39 F40		0	Target Observation Observation Observation Observation Target Target Observation				
unctional hyp iallstones laemorrhagie lepatalgia lepatic encep lepatic fibrosis lepatic steato	absent present absent a640,70 a69,30 a29,10 a9,0 present absent present absent present absent present absent present absent present absent present absent present absent	Inherited	Hepatic fibrosi	Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy fibrosis	F94 F44 F45 F124 F126 F127 F14 F15 F91 F92 F106 F107 F97 F98 F33 F33 F34 F39 F40 F104		0	Target Observation Observation Observation Observation Target Target				
unctional hyp iallstones laemorrhagie lepatalgia lepatic encep lepatic fibrosis lepatic steato	absent present absent a60, 70 a60, 70 a60, 70 a50, 30 a29, 10 a9, 0 a9, 0 present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent	Inherited	Hepatic fibrosi	Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy fibrosis Steatosis	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92 F106 F107 F97 F98 F33 F34 F39 F40 F104 F105	0.846924	0	Target Observation Observation Observation Observation Target Target Observation				
Sallstones Idaemorrhagie Idepatic encep. Idepatic fibrosis Idepatic steato.	absent present a640,70 a69,30 a29,10 a9,0 present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent	Inherited	Hepatic fibrosi	Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy fibrosis Steatosis	F94 F44 F45 F124 F126 F127 F14 F15 F91 F92 F106 F107 F97 F98 F33 F34 F39 F40 F104 F105 F6	0.0815451	0	Target Observation Observation Observation Observation Target Target Observation				
Functional hyp Sallstones Haemorrhagie Hepatalgia Hepatic encep Hepatic fibrosis Hepatic steato Hepatomegaly Hepatoxic m	absent present absent a60, 70 a60, 70 a60, 70 a50, 30 a29, 10 a9, 0 a9, 0 present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent	Inherited	Hepatic fibrosi	Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy fibrosis Steatosis hepatomegaly	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92 F106 F107 F97 F98 F33 F34 F39 F40 F104 F105	0.846924	0	Target Observation Observation Observation Observation Target Target Observation Observation				
Sallstones Haemorrhagie Hepatalgia Hepatic encep Hepatic fibrosis Hepatic steato Hepatomegaly	absent present absent a640,70 a69,30 a29,10 a9,0 present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent	Inherited	Hepatic fibrosi	Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy fibrosis Steatosis	F94 F44 F45 F124 F126 F127 F126 F127 F14 F15 F91 F92 F106 F107 F97 F98 F33 F33 F34 F39 F40 F104 F105 F6 F7	0.846924 0.0815451 0.918455	0	Target Observation Observation Observation Observation Target Target Observation				
Functional hyp GGTP Gallstones Haemorrhagie Hepatalgia Hepatic fibrosis Hepatic steato Hepatotoxic m Hepatotoxic m	absent present a640,70 a69,30 a29,10 a9,0 present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent	Inherited	Hepatic fibrosi	Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy fibrosis Steatosis hepatomegaly	F94 F44 F45 F124 F125 F126 F127 F14 F15 F91 F92 F106 F107 F97 F98 F33 F34 F39 F40 F104 F105 F6 F7	0.846924 0.0815451 0.918455 0.135908	0	Target Observation Observation Observation Observation Target Target Observation Observation				
Sallstones Haemorrhagie Hepatalgia Hepatic encep Hepatic fibrosis Hepatic steato Hepatomegaly	absent present absent a640,70 a69,30 a29,10 a9,0 present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent	Inherited	Hepatic fibrosi	Hyperbilirubin ggtp gallstones bleeding hepatalgia encephalopathy fibrosis Steatosis hepatomegaly	F94 F44 F45 F124 F126 F127 F126 F127 F14 F15 F91 F92 F106 F107 F97 F98 F33 F33 F34 F39 F40 F104 F105 F6 F7	0.846924 0.0815451 0.918455	0	Target Observation Observation Observation Observation Target Target Observation Observation				

Node Name	State Name	Special Name	Special Name		State Id	Prior Probability			Ra	Ma.	. I ar.	I
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	absent				F11	0.46495						T
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	present		1		F20		İ	T.	Ī	Ť	Г	Ť
	absent				F21						Ė	Ť
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iscory or viral		<u> </u>	<u> </u>	VII_aIIIII	F4	0.173104		Observation	1		-	ļ
	present						-					
	absent				F5	0.826896						_
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mpaired cons	ļ			consciousness			U	Observation	IV.			-
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	absent				F142							
ncreased live				density			0	Observation	V			
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	absent				F109		-				Г	T
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iljections iii t			<u> </u>	injections	F10			Observation	1		-	-
	present				F18		_					_
	absent				F19							
rregular liver				irregular_liver			0	Observation	┍			
	present				F152		T			T	Г	
	absent				F153						Ė	
rregular liver	- Julia			edge			0	Observation	V			
negular liver	ļ	ļ	<u> </u>	eage			U	Observation	IV.	11	-	
	present				F150		_					
	absent				F151							
tching				itching			0	Observation	V			
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	absent				F58						Ė	
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	present				F76							j
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Node Name		Special Name	Special Name	Node Id		Prior Probability	Cost	Time	P-	Ma		
Node Name	State Name	Special Name	Special Name	Node Id	State Id	Prior Probability				Ma	. Tar.	
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	present									1		
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	absent				F74 F75						H	Ì
iver palms				palms			0	Observation	V		F	
iver palms				palms			0	Observation	V	Г	 -	
iver palms	absent present			palms	F75 F158		0	Observation	V	Г	Г	
	absent				F75						F	
	present absent			palms pain	F75 F158 F159		0	Observation Observation	V		F	
	present absent present				F75 F158 F159						F	
Musculo-skele	present absent			pain	F75 F158 F159		0	Observation	✓	Г	F	
Musculo-skele	present absent present				F75 F158 F159						F	
Musculo-skele	present absent present absent			pain	F75 F158 F159		0	Observation	✓	Г	E	
Musculo-skele	absent present absent present absent present			pain	F75 F158 F159 F78 F79		0	Observation	✓	Г	E	
Musculo-skele Nausea	present absent present absent			pain nausea	F158 F159 F78 F79		0	Observation Observation	D	Г	E	
Ausculo-skele	absent present absent present absent present absent			pain	F75 F158 F159 F78 F79 F137 F137		0	Observation	✓	Г	E	
Ausculo-skele	absent present absent present absent present absent present apsent apsent	-		pain nausea	F75 F158 F159 F78 F78 F137 F138 F37		0	Observation Observation	D	Г		
lusculo-skele lausea Obesity	absent present absent present absent present absent			pain nausea obesity	F75 F158 F159 F78 F79 F137 F137		0	Observation Observation Observation		П	E	
Musculo-skele Nausea Obesity	absent present absent present absent present absent present apsent apsent	Inherited		pain nausea	F75 F158 F159 F78 F78 F137 F138 F37		0	Observation Observation	D	Г		
lusculo-skele lausea Obesity	absent present absent present absent present absent present apsent apsent	Inherited	PBC:present	pain nausea obesity	F75 F158 F159 F78 F78 F137 F138 F37		0	Observation Observation Observation		П		
lusculo-skele lausea Obesity	absent present absent present absent present absent present absent present absent present absent	Inherited	PBC present	pain nausea obesity	F75 F158 F159 F78 F79 F137 F138 F37 F38 F37 F38		0	Observation Observation Observation		П		
Musculo-skele lausea Dbesity	absent present absent present absent present absent present absent present absent	Inherited	PBC:present	pain nausea obesity PBC	F75 F158 F159 F78 F79 F137 F138 F37 F38		0	Observation Observation Observation Target	D D			
Musculo-skele lausea Dbesity	absent present absent present absent present absent present absent present absent present absent present absent	Inherited	PBC:present	pain nausea obesity	F75 F158 F159 F78 F79 F137 F138 F37 F38 F31 F32		0	Observation Observation Observation		П		
Musculo-skele lausea Dbesity	absent present absent present absent present absent present absent present absent present absent present absent	Inherited	PBC:present	pain nausea obesity PBC	F75 F158 F159 F78 F79 F137 F137 F138 F37 F38 F31 F32 F63		0	Observation Observation Observation Target	D D			
dusculo-skele Nausea Desity BC	absent present absent present absent present absent present absent present absent present absent present absent	Inherited	PBC:present	pain nausea obesity PBC pain_ruq	F75 F158 F159 F78 F79 F137 F138 F37 F38 F31 F32		0	Observation Observation Observation Target Observation				
dusculo-skele Nausea Desity BC	absent present absent present absent present absent present absent present absent present absent present absent	Inherited	PBC:present	pain nausea obesity PBC	F75 F158 F159 F78 F79 F137 F137 F138 F37 F38 F37 F38 F31 F32 F63 F64		0	Observation Observation Observation Target	P P			
dusculo-skele Nausea Desity BC	absent present absent present absent present absent present absent present absent present absent present absent	Inherited	PBC:present	pain nausea obesity PBC pain_ruq	F75 F158 F159 F78 F79 F137 F137 F138 F37 F38 F31 F32 F63		0	Observation Observation Observation Target Observation				
dusculo-skele Nausea Desity BC	absent present absent present absent present absent present absent present absent present absent present absent present absent present absent	Inherited	PBC:present	pain nausea obesity PBC pain_ruq	F75 F158 F159 F78 F79 F137 F137 F138 F37 F38 F31 F32 F63 F64 F84		0	Observation Observation Observation Target Observation				
dusculo-skele Nausea Desity BC	absent present absent present absent present absent present absent present absent present absent present absent present absent present absent	Inherited	PBC:present	pain nausea obesity PBC pain_ruq	F75 F158 F159 F78 F79 F137 F138 F37 F38 F31 F32 F63 F64 F84 F84 F85		0	Observation Observation Observation Target Observation				
dusculo-skele Nausea Desity BC	absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent a591_300 a299_150 a149_100	Inherited	PBC present	pain nausea obesity PBC pain_ruq	F75 F158 F159 F78 F79 F137 F137 F138 F37 F38 F31 F32 F63 F64 F84 F85 F86		0	Observation Observation Observation Target Observation				
dusculo-skele lausea BC BC lain in right u	absent present absent present absent present absent present absent present absent present absent present absent present absent present absent	Inherited	PBC:present	pain nausea obesity PBC pain_ruq platelet	F75 F158 F159 F78 F79 F137 F138 F37 F38 F31 F32 F63 F64 F84 F84 F85		0	Observation Observation Observation Target Observation Observation				
dusculo-skele lausea Dibesity BC Pain in right u	absent present absent present absent present absent present absent present absent present absent present absent present absent absent present absent present absent present absent absent present abse	Inherited	PBC present	pain nausea obesity PBC pain_ruq	F75 F158 F159 F78 F79 F137 F137 F138 F37 F38 F37 F38 F31 F32 F63 F64 F84 F84 F85 F86 F87		0	Observation Observation Observation Target Observation				
dusculo-skele lausea BC BC lain in right u	absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent a591_300 a299_150 a149_100	Inherited	PBC:present	pain nausea obesity PBC pain_ruq platelet	F75 F158 F159 F78 F79 F137 F137 F138 F37 F38 F31 F32 F63 F64 F84 F85 F86		0	Observation Observation Observation Target Observation Observation				
dusculo-skele lausea Dibesity BC Pain in right u	absent present absent present absent present absent present absent present absent present absent present absent present absent absent present absent present absent present absent absent present abse	Inherited	PBC present	pain nausea obesity PBC pain_ruq platelet	F75 F158 F159 F78 F79 F137 F137 F138 F37 F38 F37 F38 F31 F32 F63 F64 F84 F84 F85 F86 F87		0	Observation Observation Observation Target Observation Observation				
flusculo-skele lausea Dibesity BC Pain in right u Platelet count	absent present absent present absent present absent present absent present absent present absent absent absent absent absent absent apsent absent aps	Inherited	PBC:present	pain nausea obesity PBC pain_ruq platelet	F75 F158 F159 F78 F79 F137 F137 F138 F37 F38 F31 F32 F63 F64 F84 F85 F86 F87		0	Observation Observation Observation Target Observation Observation Observation				
flusculo-skele lausea Dibesity BC Pain in right u Platelet count	absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent	Inherited	PBC:present	pain nausea obesity PBC pain_ruq platelet	F75 F158 F159 F78 F79 F137 F138 F37 F38 F31 F32 F63 F64 F84 F85 F86 F87 F154 F155		0	Observation Observation Observation Target Observation Observation				
Mausea Desity Pain in right u Platelet count	absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent application appli	Inherited	PBC:present	pain nausea obesity PBC pain_ruq platelet	F75 F158 F159 F78 F79 F137 F137 F138 F31 F32 F63 F64 F84 F85 F86 F87 F155 F133		0	Observation Observation Observation Target Observation Observation Observation				
Nausea Desity Pain in right u Presence of a	absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent	Inherited	PBC:present	pain nausea obesity PBC pain_ruq platelet hbc_anti	F75 F158 F159 F78 F79 F137 F138 F37 F38 F31 F32 F63 F64 F84 F85 F86 F87 F154 F155		0	Observation Observation Target Observation Observation Observation Observation Observation				
lausea Desity PBC Vain in right u Viresence of a	absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent application appli	Inherited	PBC:present	pain nausea obesity PBC pain_ruq platelet	F75 F158 F159 F78 F79 F137 F138 F37 F38 F31 F32 F63 F64 F84 F85 F86 F87 F154 F155 F133 F134		0	Observation Observation Observation Target Observation Observation Observation				
lausea Desity PBC Vain in right u Viresence of a	absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent application appli	Inherited	PBC:present	pain nausea obesity PBC pain_ruq platelet hbc_anti	F75 F158 F159 F78 F79 F137 F137 F138 F31 F32 F63 F64 F84 F85 F86 F87 F155 F133		0	Observation Observation Target Observation Observation Observation Observation Observation				
lausea Desity PBC Vain in right u Viresence of a	absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent	Inherited	PBC:present	pain nausea obesity PBC pain_ruq platelet hbc_anti	F75 F158 F159 F78 F79 F137 F138 F37 F38 F31 F32 F63 F64 F84 F85 F86 F87 F154 F155 F133 F134 F156		0	Observation Observation Target Observation Observation Observation Observation Observation				
Presence of a	absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent	Inherited	PBC:present	pain nausea obesity PBC pain_ruq platelet hbc_anti hbsag_anti	F75 F158 F159 F78 F79 F137 F138 F37 F38 F31 F32 F63 F64 F84 F85 F86 F87 F154 F155 F133 F134		0	Observation Observation Observation Target Observation Observation Observation Observation Observation				
Musculo-skele Nausea Desity Pain in right u Presence of a Presence of a Presence of h	absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent application appli	Inherited	PBC:present	pain nausea obesity PBC pain_ruq platelet hbc_anti	F75 F158 F159 F78 F79 F137 F138 F37 F38 F31 F32 F64 F84 F85 F86 F87 F154 F155 F133 F134 F156 F157		0	Observation Observation Target Observation Observation Observation Observation Observation				
lusculo-skele lausea besity BC ain in right u liatelet count resence of a resence of a	absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent present absent	Inherited	PBC:present	pain nausea obesity PBC pain_ruq platelet hbc_anti hbsag_anti	F75 F158 F159 F78 F79 F137 F138 F37 F38 F31 F32 F63 F64 F84 F85 F86 F87 F154 F155 F133 F134 F156		0	Observation Observation Observation Target Observation Observation Observation Observation Observation				

Node Name	State Name	Special Name	. Special Name	Node Id	State Id	Prior Probability			Ra	Ma	Tar	[
Presence of h				hbsag			0	Observation	V			ľ
	present				F131							Ī
	absent				F132							Ī
Pressure in rig				pressure ruq			0	Observation	V			Т
	present				F65				Ī	Ĭ	Г	Ī
	absent				F66						Г	Ť
Reactive hepa		Inherited		RHepatitis				Target	₹			T
	present		Reactive hepa		F49		İ				V	Ť
	absent				F50							Ť
Sex				sex			0	Observation	₽			Ť
	female				F25	0.597997	İ		1	1	Г	Ť
	male	""		1	F26	0.402003					Г	Ť
Surgery in the				surgery			0	Observation	▽		-	Ť
	present		· İ	7-7-7	F12	0.423462	Ť.			1	Г	Ť
	absent			1	F13	0.576538					Ė	Ť
Total bilirubin				bilirubin		2.370330	0	Observation	V	Г	_	Ī
Total Dill ubill	a88_20			Dim GDIII	F53			ODJC114HOII		-	г	÷
	a19 7				F54						Ė	÷
	a6_2				F55						Ė	÷
	al 0				F56						-	÷
Total choleste	a1_0			cholesterol	130		0	Observation	✓	П		÷
Total Choleste	a999 350		·	CHOICSCEIO	F128			Observation	11			÷
					F129	-					'n	ł
	a349_240										'n	÷
	a239_0		1	1	F130		0	01 1:	✓			÷
Total proteins	1			proteins			U	Observation	N.		_	+
	a10_6		ļ		F80							
	a5_2				F81					_	Г	ļ
Total triglyceri				triglycerides			0	Observation	V			ł
	a17_4				F46							ļ.
	a3_2				F47							ļ.
	a1_0				F48		<u> </u>				Г	1
Toxic hepatitis		Inherited		THepatitis				Target				Į.
	present		Toxic hepatitis		F8						V	Į.
	absent				F9							1
Upper abdomi				upper_pain			0	Observation	V			ļ
	present				F59						Г	ļ
	absent				F60						Г	ſ
Vascular spiders				spiders			0	Observation	V			Ī
•	present				F143					İ	Г	Ť
	absent	"			F144						Ė	Ť
Yellowing of t				skin			0	Observation	V			Ť
	present	•			F70							÷
	absent	-		-	F71	-					-	+

Como objetivo están seleccionados las enfermedades como tal: carcinoma, hepatitis crónica, cirrosis, esteatosis hepatica, fibrosis hepatica, hepatitis tóxica, hepatitis reactiva, PBC y hiperbilirrubinemia funcional. El resto son nodos auxiliares. Todos están seleccionados como ranked, pero solo las opciones que no eran "ausente" de los nodos objetivos están seleccionadas como objetivo.

b) Utiliza la ventana de diagnóstico para estudiar las siguientes situaciones: supongamos un paciente que tiene alto el colesterol total (a999_350) y los triglicéridos totales (a17_4). ¿Cuál es la enfermedad que tiene mayor probabilidad en el caso de que dicho paciente sea hombre, y con qué probabilidad la padece? ¿Y en el caso en que sea mujer?. ¿Qué prueba conviene realizarle a cada uno de ellos a continuación si se quiere demostrar que tiene dicha enfermedad? ¿Cuánto cambian las probabilidades si se realiza dicha prueba y se obtiene que el resultado es positivo?



Para el caso del hombre, la salida es la siguiente:

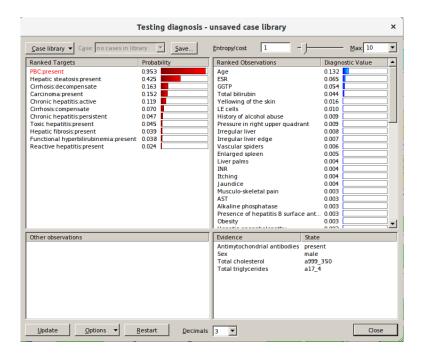
<u>Update</u> <u>Options</u> ▼ <u>Restart</u>

Para confirmar o descartar la esteatosis hepatica, lo siguiente que deberíamos haccer es realizarle una prueba de anticuerpos antimitocondriales. Tras la prueba, los resultados son:

<u>D</u>ecimals 3 ▼

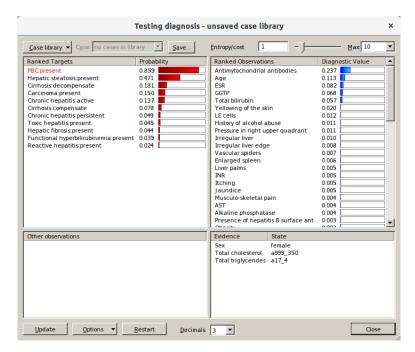
Sex male
Total cholesterol a999_350
Total triglycerides a17_4

Close

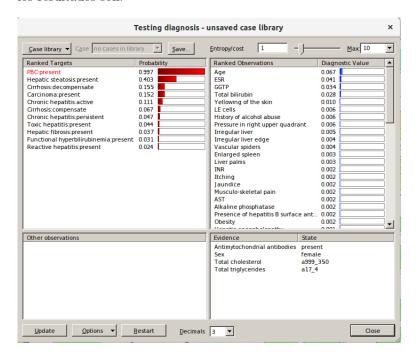


Por lo que el diagnóstico cambia a PBC.

En el caso de la mujer, la salida es la siguiente:



Para confirmar o descartar el PBC, lo siguiente que deberíamos haccer es realizarle una prueba de anticuerpos antimitocondriales. Tras la prueba, los resultados son:



Con lo que parece que se confirma el PBC.

4. Ejercicio Opcional

GeNIe permite guardar casos que han sido diagnosticados con una red, y estos casos se pueden utilizar luego (por ejemplo, para hacer aprendizaje y mejorar los parámetros de la red). Para ello se utiliza la opción Case Manager, que vas a explorar con ayuda de este tutorial. Para la entrega, abre de nuevo la red Hepar_II, y resuelve lo siguiente:

a) Vamos a ir diagnosticando algunos pacientes, y mientras que introducimos sus datos, vamos a ir guardando sus casos:

Juan Pérez	María Serrano		Iván García	
Planta 5	Planta 4		Planta 3	
Dr Rodríguez	Dr. López		Dr. López	
Sex male Enlarged spleen present Vascular spiders present Irregular liver edge present Total cholesterol a999_350 Irregular liver present	ESR Platelet count Age Sex Irregular liver Antimytochondrial antibodies	a14_0 a99_0 age51_65 female absent present	INR History of alcohol abuse Total triglycerides Sex Irregular liver edge Irregular liver	a109_70 present a17_4 male present present

Para cada uno de ellos, indica qué enfermedad es más probable que padezcan, y con qué probabilidad.

b) Crea un nuevo caso (Juana Pérez), cargando el caso Iván García y modificando el sexo a mujer. ¿Cómo cambia el diagnóstico? Si guardas la red con otro nombre (por ejemplo, Hepar II-cases), podrás comprobar que cuando la abres, si pinchas en la opción Case Manager, los casos se han guardado junto con la red.

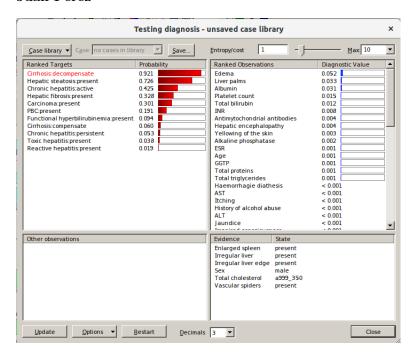
4.1. Solución

a) Vamos a ir diagnosticando algunos pacientes, y mientras que introducimos sus datos, vamos a ir guardando sus casos:

Juan Pérez		María Serrano		Iván García		
Planta 5		Planta 4	Planta 3			
Dr Rodríguez		Dr. López		Dr. López		
Sex Enlarged spleen Vascular spiders Irregular liver edge Total cholesterol Irregular liver	male present present present a999_350 present	ESR Platelet count Age Sex Irregular liver Antimytochondrial antibodies	a14_0 a99_0 age51_65 female absent present	INR History of alcohol abuse Total triglycerides Sex Irregular liver edge Irregular liver	a109_70 present a17_4 male present present	

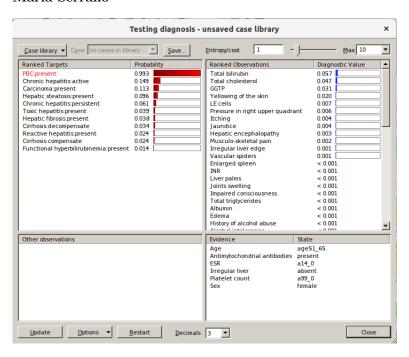
Para cada uno de ellos, indica qué enfermedad es más probable que padezcan, y con qué probabilidad.

Juan Pérez



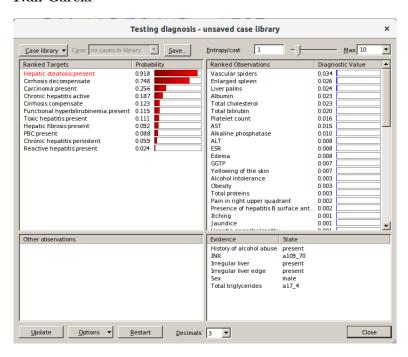
Lo más probable es que Juan padezca cirrosis, con un 92.1 %.

María Serrano



Lo más probable es que María padezca PBC, con un 99.3 %.

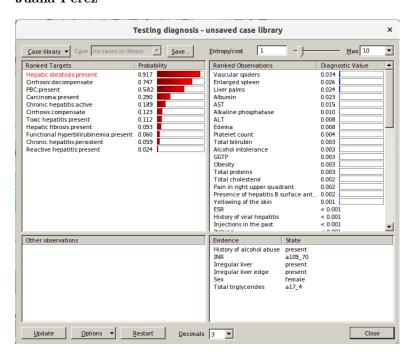
Ivan García



Lo más probable es que Iván padezca esteatosis hepatica, con un $91.8\,\%$.

b) Crea un nuevo caso (Juana Pérez), cargando el caso Iván García y modificando el sexo a mujer. ¿Cómo cambia el diagnóstico?

Juana Pérez



El diagnóstico ahora es este
atosis hepatica, con un 91.7 %.

Referencias

[1] Información oficial de GeNIe, https://www.bayesfusion.com.