Q 21. $P \rightarrow Q$ $\neg P \vee Q$

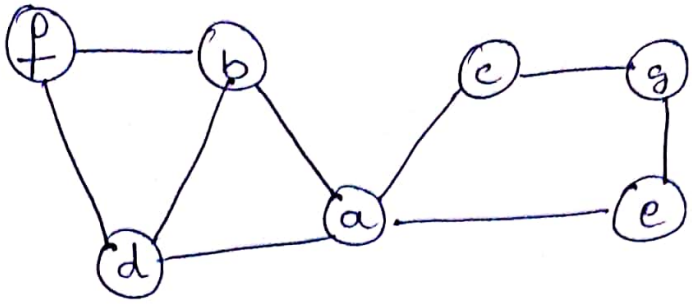
Truth table

P	Q	$\neg P$	$\neg P \vee Q$	$P \rightarrow Q$
T	T	F	T	T
T	F	F	F	F
F	T	T	T	T
F	F	T	T	T

From the output we can see that

$\neg P \vee Q$ & $P \rightarrow Q$ are logically equivalent.

Q23



DFS

open [a] : close [ ]

open [b, c, d, e] : close [a]

open [f, c, d, e] : close [b a]

open [c, d, e] : close [f b a]

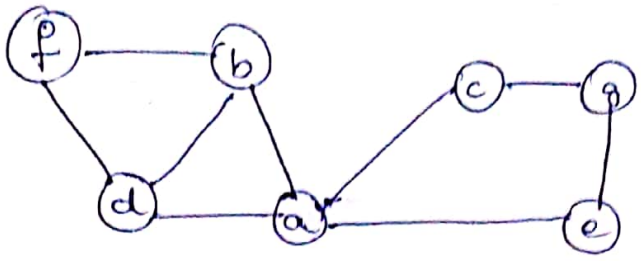
open [g, d, e] : close [c, f, b, a]

open [d, e] : close [g, c, f, b, a]

open [, e] : close [d, g, c, f, b, a]

open [ ] : close [e, d, g, c, f, b, a]

Q24 BFS



Open [a] , close [ ]

Open [b, c, d, e] close [a]

Open [c, d, e, f] close [b a]

Open [d, e, f, g] close [c, b, a]

Open [e, f, g] close [d, c, b, a]

Open [f, g] close [e, d, c, b, a]

Open [g] close [f, e, d, c, b, a]

Open [ ] close [g, f, e, d, c, b, a]

Q25

heuristic value

A	223	E 165	I 100 M 0
B	222	F 136	J 60
C	166	G 122	K 32
D	192	H 11	L 102

$f(n) = G(n) + h(n)$

- A starting with

$= 0 + 223$

$A = 223$

$A \to C \to L = 243$

$A \to C \to F = 228$ ✓

- $A \to C \to F \to K = 236$

$A \to C \to F \to J = 264$

$A \to C \to F \to K \Rightarrow M = 236$

$A \to C \to F \to K \to J = 300$

$A \to C \to L \to M = 243$

$A \to B = 36 + 222 = 258$

✓ $A \to C = 61 + 166 = 227$

✓ $A \to C \to L = 243$

✓ $A \to C \to F = 228$

✓ $A \to C \to F \to K = 236$

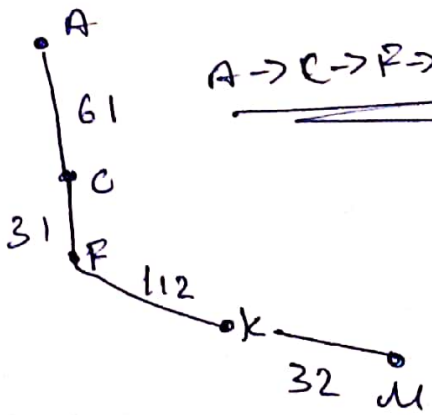
$A \to C \to F \to J = 264$

✓ $A \to C \to F \to K \to M = 236$ ✓

$A \to C \to F \to K \to J = 300$

$A \to C \to L \to M = 243$ ✓

Solution



$A \to C \to F \to K \to M$

Total Cost = 236

Q 3.25 B

The straight-line distance heuristic used above is known to be an admissible heuristic. What does this mean & why is it important?

- Admissible heuristic doesn't not overestimates cost. Straight-line distance is the shortest path between the start & end state.
- Admissible heuristic is optimal & it prefers the lowest cost blw nodes.

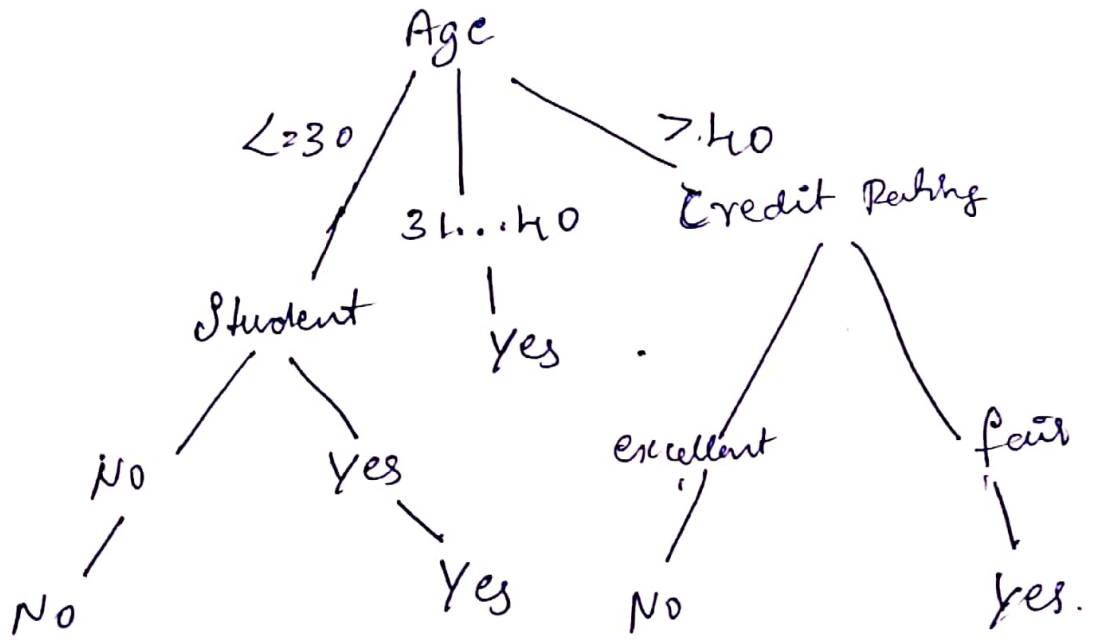
Q26

Gain (age) = 0.246

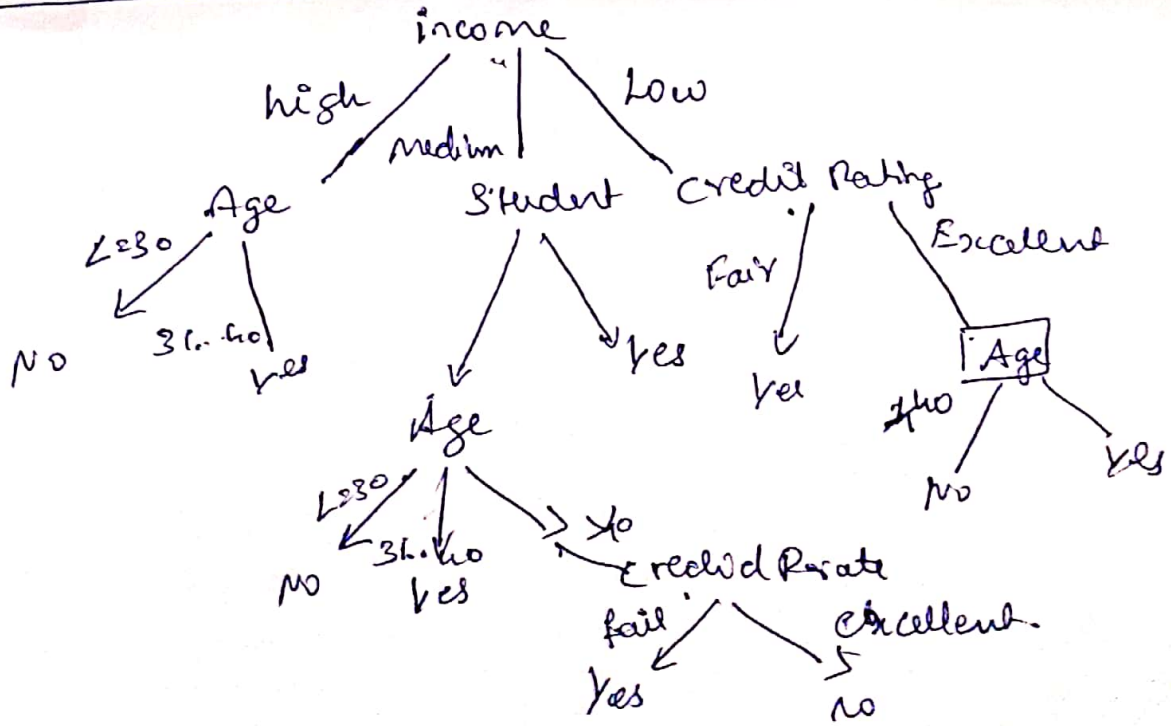
Gain (Student) = 0.151

Gain (Credit rating) = 0.048

Gain (income) = 0.029.



Buys computer.



Q 22

$P = \exp(-\Delta E / T)$

E → current Evaluation → 485

T → current Temperature → 309

$= \exp(-\Delta E / T)$

Neighbourhood → 479

current Temperature → 309

$= \exp(485 - 479 / 309)$

$= \exp(6/309)$

$P = \exp(0.01941)$