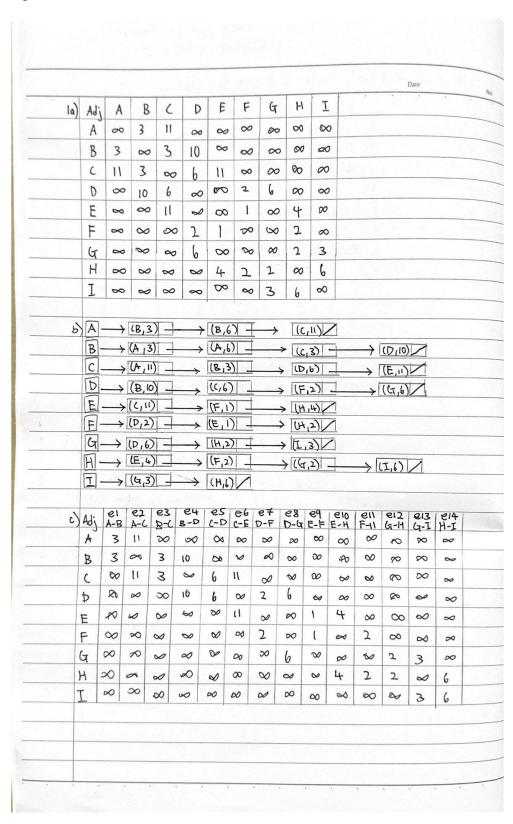
CSCI203: Algorithms and Data Structures

Assignment 3 Solutions

Question 1i, 1ii and 1iii:



Question 2a:

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Question 2b:

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1	TO F : A, B, E, F	(k.73	1, 4, -	5j=.	= V						
	TO G : A, C, G			81	5=3						
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Question 3i and 3ii:

3) The heuristics are not admissable. At state A to C, h(s)-h(s') = 28 which is than the distance of 27. At state B to E h(s)-h(s') = 11 which is more than the distance of 9. At state D to E, h(s) - h(s') = 4 which is more than the distance of 9. At state D to E, h(s) - h(s') = 4 which is more than the distance of 3. (hounge H = 3 at c, H = 8 at E, H				Date	No.							
## Han the distance of 27. At state B to E \(\text{N(s)} = \text{11 which is more than the distance of 9. At state D to E, \(\text{N(s)} = \text{N(s)} = \text{4 which is more than the distance of 3.} \) Therefore by A state D to E, \(\text{N(s)} = \text{N(s)} = \text{4 which is more than the distance of 9. At state D to E, \(\text{N(s)} = \text{N(s)} = \text{4 which is more than the distance of 9. At state D to E, \(\text{N(s)} = \text{11 which is more than the distance of 9. At state D to E, \(\text{N(s)} = \text{12 which is more than the distance of 9. At state D to E, \(\text{N(s)} = \text{12 which is more than the distance of 9. At state D to E, \(\text{N(s)} = \text{12 which is more than the distance of 9. At state D to E, \(\text{N(s)} = \text{12 which is more than the distance of 9. At state D to E, \(\text{N(s)} = \text{13 which is more than the distance of 9. At state D to E, \(\text{N(s)} = \text{14 which is more than the distance of 9. At state D to E, \(\text{N(s)} = \text{14 which is more than the distance of 9. At state D to E, \(\text{N(s)} = \text{14 which is more than the distance of 9. At state D to E, \(\text{N(s)} = \text{14 which is more than the distance of 9. At state D to E, \(\text{N(s)} = \text{14 which is a more than the distance of 9. At state D to E, \(\text{N(s)} = \text{14 which is a more than the distance of 9. At state D to E, \(\text{N(s)} = \text{14 which is a more than the distance of 9. At state D to E, \(\text{N(s)} = \text{14 which is a more than the distance of 9. At state D to E, \(\text{N(s)} = \text{14 which is a more than the distance of 9. At state D to E, \(\text{N(s)} = \text{14 which is a more than the distance of 9. At state D to E, \(\text{N(s)} = \text{14 which is a more than the distance of 9. At state D to E, \(\text{N(s)} = \text{14 which is a more than the distance of 9. At state D to E, \(\text{N(s)} = \text{14 which is a more than the distance of 9. At state D to E, \(\text{N(s)} = 14 which is a more than the distance of 9.	3) T	he heuristics me at place	ceal to At out A to C b	(5)-6(5)=2	8 which is a							
distance of 9. At state D to E, h(s) - h(s') = 4 which is more than the distance of 3. change H = 3 at c, H = 18 at E, H = 8 at E f(a) = g(Ac) + h(a)	+	han the distrance of 27	At costs P to E bicl-b	(5') = (1 which	's more than							
distance of 3. (hange H=3 cxt c, H=18 at E, H=8 at F ((c) = g(Acq) + h((a)) = 33 + 0 = 33 = 27 + 3 = 30 ((a) = g(A(cq) + H(c)) = 37 + 4 + 0 = 31 = 37 + 4 + 0 = 31 = 3 + 2 + 3 = 30 ((b) = g(ABE) + H(E)) = 3 + 24 + 3 = 30 = 3 + 9 + 18 = 30 = 3 + 9 + 20 = 3 But c is aheady in close set (cose set: \$A, B,	1	distance of 9 At state of the 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2										
ii) Change H=3 at c, H=18 at E, H=8 at F f(a) = g(Aa) + h(a) f(c) = g(Ac) + H(c) = 33 + 0 = 33	d	istance of 2	TO E, NIS) = NICS)		e Tai Be had							
H = 18 at E, $H = 8$ at E, $H =$												
H=18 at E, H=8 at E f(a) = g(AG) + h(a) f(c) = g(Ac) + H(c) = 33 + 0 = 33	1	hamp H=Z a+ a		Final Last								
#=8 at # f(c) = g(AG) + h(G) = 33 +0 = 33 = 27 + 3 = 30 f(G) = g(AG) + H(G) f(B) = g(AB) + H(B) = 27 + 470 = 31 = 3 + 27 + 36 Close Set: \(\frac{2}{2} \) A, c, (\(\frac{2}{3} \) But c is already in close Set f(F) = g(ABE) + H(F) = 3 + 9 + 10 + 8 = 30 f(C) = g(ABE) + H(E) f(F) = g(ABE) + H(F) = 3 + 9 + 10 + 8 = 30 f(G) = g(ABE) + H(G) f(F) = g(ABEF) + H(F) = 3 + 9 + 10 + 8 = 30 f(G) = g(ABEF) + H(G) = 3 + 9 + 10 + 5 + 3 = 30 f(G) = g(ABEFG) + H(G) = 3 + 9 + 10 + 5 + 3 = 30 f(G) = g(ABEFG) + H(G) Set: (annot process f(G) = g(ABEFG) + H(G) = 3 + 9 + 10 + 5 + 3 = 30 f(G) = g(ABEFG) + H(G) Set: (annot process Connot process Connot process Connot process f(G) = g(ABEFG) + H(G) Set: (annot process f(G) = g(ABEFG) + H(G) Set: (annot process Connot process Co	1)		The second of th									
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Close Set: \(\xi A, c, \land \xi \) \[\begin{align*} \text{f(c)} : g(ABC) + h(c) & f(E) = g(ABE) + H(E) & f(D) = g(ABD) + H(D) \\ \text{= 3+24+3=30} & = 3+9+18=30 & = 3+9+20=3 \\ \text{But c is aheady in close set} & close set: \(\xi A, B, E \xi \) \[\text{: cannot proceed} & \psi & f(E) = g(ABDE) + H(E) \\ \text{= 3+9+10+8=30} & \text{but c is already in comparison of the context process.} \\ \text{= 3+9+10+5+3=30} & \text{P(G)} = g(ABEFG) + H(G) \\ \text{But C is already in close set} & = 3+9+10+10+0=3\) \[\text{: cannot proceed} & \text{Obse set: } \(\xi A, B, E, F, G \) \[Therefore by A \text{Search, the shortest poth from Start starte (A) to the context poth from Start starte (B) to the context poth from Starte (B) to the			0									
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f(c): g(ABC)+h(c) = 3+24+3=30 = 3+9+18=30 = 3+9+20=3 But c is already in close set close set: \$A,B,E3 :. cannot proceed f(F)=g(ABEF)+H(F) = 3+9+10+8=30 f(c):g(ABEF()+h(c)) = 3+9+10+5+3=30 f(d)=g(ABEF()+H(d) Set: (annot proceed) = 3+9+10+5+3=30 f(d)=g(ABEF()+H(d) Set: (annot proceed) - 3+9+10+10+0=32 :. cannot proceed Therefore by A* Search, the shortest porth from stout state (A) to the												
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= 3+9+10+8=30 but e is already in a f(c):g(ABEFC)+h(c) = 3+9+10+5+3=30												
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Therefore by A * Search, the shortest porth from start state (A) to the goal state (G) is A to C to G with a cost of 31		cannot proceed	thereon Sulphild?		25 30000							
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