

DEPARTMENT OF MASTER OF COMPUTER APPLICATION

Mathematical Foundation for Computer Applications Activity - 3

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Professor

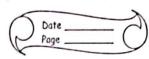
School of CS & IT

19 Let P be the Statement "Maria Learns discrete Mathematics" and Q the Statement "Maria will find a good job" express the statement P→9 as a statement in english. From the defination of Conditional Statements, we see that when p is the Statement "Maria Learns discrete Mathematics" and I is the statement "Maria will find a good job! "P-) & represents the Statement. "If maria Learn's discrete Mathematics, then she will find There are many other ways to express this conditional Statement in english. Among the most natural of these are "Maria will find a good job when she learns the discrete Hamathematics good sent sil soldate durt "For Maria to get a good job, it is sufficient for her to leave discrete Mathematics." han and equipped that is all in dollars done oldieras Maria will find a good job unless she does not learn discrete mathematics is milioner home 20) Construct the truth table of the Compound proposition (PV~q) -> (PAq) Soly Because this truth table involves two propositional variable Pand 9, there are four rows in this truth table, one for each of the pairs of truth values. TT, TF, FF, FF. The first two columns are used for the truth values of P and & respectively. In the third column we find the truth values

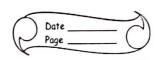
of ~9 needed to find the truth values of PV~9, found

in the fourth column. The fifth column gives the truth value

of PAQ Finally, the truth value of (PV~9) -> (Pre)



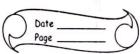
	rage					
· 1 v	Is found in the last column. The resulting truth Table Is shown table 1.					
toward to	is shown table 1.					
	della					
tore	Table 1 The truth table of (PV~9) -> (PA9)					
The state of the s	II and the second of the secon					
t to a se	P 9 ~9 PV~9 PAQ (PV~9) -> (PAQ) T T F T T T T. F T T F					
	TTFTTT					
1.9 4	To make it Touch Touch From Company					
	FTFFFT					
	F. F. T. T. T. F.					
0.4	work of water was all promise distance of two materials					
3	3) Show that ~ (Pva) and ~P 1~9 ore logically equivalent.					
عامِی	The truth tables for these Compound propositions are					
	displayed in table 2 Because the truth values of the					
	Compound propositions ~ (PV9) and ~PA~9 agree for all					
	possible combination of the truth values of P and 9, it follows that ~ (Pva) (> (~PA~9). is a tantalogy and that					
and!	follows that ~ (Pra) (> (~Pra). is a tantalogy and that					
	these Compound propositions are logically equivalent.					
	Table 2 Truth Tables for ~ (PVQ) and ~PA~2					
	Mary Lee (provid)					
	P 9 PV9 ~ (pv2), ~P, ~9 ~pn~2					
- 11	That To be mark to Es					
	TO THE THE WAR TO SEE TO SEE					
- Farin	OF Town Town Town For Town From From From From From From From From					
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	ward to sould tent all evil at tooser to for					
	dust all if a use oill all amor and salal					
	to come to me and asternal the first for					
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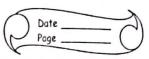
4	Prove by PMI that 1+2+3++n = n(n+1)					
	sandtele tess (pas) sat					
Sol :	Let P(n) be the statement that $1+2+3+n = n(n+1)$					
	2					
9.1	Step 62 - w Putan=1-1 and it is a marketing to second					
nd .	2 Step (3) - un Putan = 1-h and at " a coveradus (" several") promote 12 (LHS) = 1 all BC-G transition (and the second)					
	RHS = I(1+1) - 2 - 1					
	2 2					
	= int -inLHs = RHS = (F. Pa) is true = in I.					
	Step(2):- Assume that P(n) is true for n=K					
oi dam	other in white pools tree it and the alternation					
	1+2+3+ ····+K = K(K+1)					
	ox tem : it most win tour people with annot 21 11"					
U	Step (3):- Now, we have to prove that f(n) is true for					
	n=(K+1) LHS of P(K+1)					
	1+2+3+K+K-1 = (K+1) (K+2)					
	The first proper states the state of the sta					
	1+2+3++K+K+1					
	= K(K+1) + K+1					
	= 2 + K+1					
a mice t	a my mot = (k+) k+1 1 pains to a 1 1. 11"					
	Later and = (K+D (K+2) = RHS Hanger had all plo					
	ito sociate					
	-: P(n) is true for new					
	By PMI P(A) is true & nEN					
	= Prove					
	II					



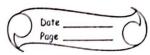
5)	Find the Contrapositive, the Converse, and the inverse of				
	the Conditional Statement.				
	The home team wins whenever it is realining. In				
<u>Sol</u>)					
	Because "9 whenever P" is one of the ways to express the				
	Conditional Statement P-92. The oxiginal Statement can be				
	rewritten as.				
	"It is raining, then the home team wins"				
	Had with most of last of the state of the state				
	Consequently, the Contrapositive of athis: Conditional Statement is				
	"It is home team does not win, then it is not raining".				
-	mi) and si (m) tool many of mod on not estable				
	The Conveyse is (1+1) of the 21-11 (1-11)-17				
	(5-20) (1+2) - 1 - 21 12 12 12 - 2 - 2 + 2 + 1) (314-2)				
	"If the home team wins, then it is raining".				
	14.21.4.14.16.1.				
	The inverse is				
•					
,	"If it is not saining, then the home team does not win"				
	Only the Contropositive is equivalent to the oxiginal				
	Statement.				
	14211 X 301 + 11 (000 1119 118)				
	White too the state of the stat				



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6	What is the truth value of Yxp(x), where p(x) is the Statement					
0 1 - 1 - 1 - 1	"x2 < 10" and the domain consists of the positive integers					
	not exceeding 4?					
	7					
<u>Sol</u>):	The statement $\sqrt{x} P(x)$ is the same as the conjuction.					
٠,	201PED APGO APGO APGO COSAN COSAN					
damen't	to still withing at makeum than suitagem in the program					
	Because the domain consists of the integers 1,2,3, and 4.					
	Because P(4), which is the statement "42<10", is false, it					
	follows withat to (P(x) 1s+ false to and 1013 soll					
	estate ti, 21 tot of by own on any other y sodrany					
tomastat	Similarly, when the elements of the domain are					
	21,22,					
	quantification $7 \times P(x)$ is the same as the disjunction.					
.979	- + root entate (o-ts) as a formation and planet.					
	That P(x) + VP(x2) V VP(xn) color low					
	side "s for down orange out my o 2 pout" enforce					
	Because this disjunction is true if and only if at					
	Because this disjunction is true if and only if at least one of P(xi), P(x) P(xn) is true.					
1 corns	and it anifor follows hereafor a for and transferred					
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10.	To see the property of product to the production of the production					
.0	P 4 0 F					



1) What do the Statements to <0 (x220), Ty to (y3 to), and Iz >0 (22=2) mean, where the domain in each case, Consists of the seal numbers? The statement & <0. (220) Statement that for every real number x with x<0, x250. That is it startes "The Square of a regative real number is positive." This statement is the same as Vr (xxa -> x2 >0). erly si, "012-55" transtore ent 11 million (1)9 The statement by to (43 to) States that for every seal number y with yto, we have y3 to. That is, it states "The Cube of every nonzero real number is nonzero . This statement 1s equivalent to vy (y to -) y3 to). Finally, the statement 32>0 (22=2) States that there exists a real number of with 2>0 Such that 22=2. That is, it states "There is a positive square sont of 2". This statement is equivalent to 72 (2>0 1 =2=2). Note that the of a Universal qualification is the same as the universal quantication of a conditional statement. For instance, (va <0/22>0) is another way of expressing same as the existential qualification of a conjuction. For instance. Jz >0 (32=2) is another way of expressing J2(2>0 1 =2=2).



Express the Statement "Every Student in this class has Studied Calculus using predicates and quantifiers. First, we rewrite the statement so that we can clearly Doing so, we obtain Doing so, we obtain For every student in this class, that student has studied colculus." Next, we introduce a variable of so that our statement becomes. "For every student of in this class, in has studied calculas" Continuing, like introduce ((x), which is the statement "x has studied calculus." Consequently, if the domain for x consists of the students in the class, we can translate our statement as vac(x). However, there are other correct approaches different domin of discourse and other predicts can be used. The approach we select depends on the subsequent reasoning we want to Carry out. For example, we may be interested in a wider group of people than only those in this class. If we change the domain to consist of all people we will need to express our statement as. Finally, when we are interested in the background of people in subjects besides calculus, we may prefer to use the two variable (x,y) for the statement "Student x has studied subject y." Then we should replace c(x) by a(x, calculate) in both expresses to obtain Vx Q(x, Calculus).

J						
q	Combinations. A farmer buys 3 cows , 2 Pigs. & 4 hers from a man who has 6 cow, 5 pig and 8 hers how many choices					
	man who has 6 caw, 5 pig and 8 bens how many choices					
6	does the farmer have.					
Sol	the good on tool or frametals all affering and tariff					
	6C3 = Cows smiliting strings and sider his					
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	According to principle of Counting					
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1: - 1 - 1 -	6c3 x 3c3 x 4c8 = 6! x 5! + x 81					
, <u> </u>	$6c_3 \times 3c_2 \times 4c_8 = 6! \times 5! \times 8!$ $3!3! 2!3! 4! \times 4!$					
.1.15	1. 3x2 1x2 4x3x2					
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