



SMIT SIKKIM
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Engineering Mathematics III

Discrete Mathematics

Lecture 32

Theory of Inference: Statement Calculus

$i = 1.$

while True;

print i

$i = i + 1$

if ($i < n$): break



↓
user input

$P: x < 0.$

if ($x < 0$):

$$y = -x + 1 - q$$

else:

$$y = x + 1$$

$$P \rightarrow q$$

$$y = 6$$

\rightarrow input : $x = -5$

\rightarrow output : $y = 0$

P : I am a student-

Q : I use mobile phone

P , $P \rightarrow Q$, Conclusion: I am David.

Determine whether the Conclusion C follows logically from the premises H_1 and H_2 .

$H_1: P \rightarrow Q$ $H_2: P$ $C: Q$

P	Q	$P \rightarrow Q$
<u>T</u>	T ✓	<u>T</u>
T	F	F
F	T	T
F	F	T

if ($x < 0$)
 else if ($x < -5$)
 \equiv
 $P \rightarrow \neg P$
 if ($x < -5$)
 else if ($x < 0$)
 $x < 0 \ \& \ x \neq -5$

H_1 : If Canada is a Country then New York is city

H_2 : New York is a city

C : Canada is a Country

if $(x == \text{Country})$:

$y = \text{city}$

$y = \text{city}$

x is a Country.

$$H_1: P \rightarrow Q \quad H_2: \neg(P \wedge Q) \quad C: \neg P$$

P	Q	$P \rightarrow Q$	$P \wedge Q$	$\neg(P \wedge Q)$	$\neg P$
T	T	T	T	F	F
T	F	F	F	T	F
F	T	T	F	T	T
F	F	T	F	T	T

Handwritten annotations on the table:

- A bracket under the first row (T, T) with a vertical line at the end.
- A bracket under the last two rows (F, T) and (F, F) with a vertical line at the end.
- A checkmark next to the row (F, T).
- A checkmark next to the row (F, F).