

DECISION TREE

SOMETIMES DECISIONS CAN BE TAKEN IN STAGES; FOR EXAMPLE, TODAY YOU MAY DO SOMETHING AND DEPENDING ON THE RESPONSE DO SOMETHING ELSE TOMORROW. THAT IS, THE DECISION IS MULTI-STAGE.

IN THESE CASES A DECISION TREE IS USED.

CONSIDER THE FOLLOWING PROBLEM A MULTIPLEX DEVELOPER IS FACING:

AT THIS POINT IN TIME EITHER A BIG MULTIPLEX (WITH 5 SCREENS, 50,000 SQFT. OF SHOPPING AREA, ETC.) OR A SMALL ONE (WITH 2 SCREENS, ETC.) CAN BE BUILT. IF ONE BUILDS A SMALL ONE NOW, ONE CAN EXPAND IT AFTER TWO YEARS DEPENDING ON THE DEMAND. THE PLANNING HORIZON IS TAKEN AS TEN YEARS. THE PROBABILITY THAT DEMAND WILL BE HIGH IS 0.75. THE OTHER REQUIRED INFORMATION ARE:

COST OF BIG MP = 5×10^7
" " SMALL " = 1×10^7
PROFIT (GIVEN H.D. + BMP) = 1×10^7 p.a. for 10 years
" (" LD + BMP) = 3×10^6 " " " "
" (" LD + SMP) = 2×10^6 " " " "
" (" HD + SMP) = 2.5×10^6 " " 2 years
" (" HD + SMP + EXP.) = 9×10^6 " " 8 "
" (" HD + SMP + EXP + LD) = 2×10^6 " " "
" (" HD + SMP + NO EXP + HD) =
COST OF EXPANSION = 4.2×10^7

USING \square TO DENOTE A DECISION PT. AND A \circ TO DENOTE A NODE AT WHICH BRANCHING IS A CHANCE EVENT THE FOLLOWING DECISION TREE IS DRAWN.