SURYA SAI KADALI – 077240

<u>FORMULATION OF WAREHOUSE PROBLEM</u>

<u>STATE</u>:

X = {0,1, 2, …………………………..,100}

<u>INPUT</u>: (Range of selling price)

U = {910,920,930,940,950,960,970,980,990,1000}

<u>UNCERTAINTY:</u> (is not knowing the client's reserve price to the seller)

RP= { 910, 920, 930, 940, 950, 960, 970, 980, 990, 1000}

P(RP) is the probability of the reserve price that clients may choose independently.

P(RP) = { 0.1535, 0.1382, 0.1244, 0.1119, 0.1007, 0.0907, 0.0816, 0.0734, 0.0661, 0.0595}

P_new = {1.0000 0.8465 0.7083 0.5839 0.4720 0.3713 0.2806 0.1990 0.1256 0.0595 }

<u>STAGE COST:</u> (stochastic, Time invariant)

$$g_t = \begin{cases} \{U\} & \text{if Selling price} <= \text{Reserve price and } X_t = \{1, ..,100\} \quad \text{(Then moves to next state with probability p\_new)} \\ 0 & \text{if Selling price} > \text{Reserve price} \quad \text{(with probability (1-p\_new) stays in the Same state)} \\ 0 & \text{if } X_t = 0 \quad \text{(when all the products are sold)} \end{cases}$$

<u>TERMINAL COST:</u>

$g_T(X_T) = 80 * X_T$ (X_T represents number of products left in the ware house i.e 0, …..,100)

DYNAMICS:

$X_{t+1} = f_t (X_t,W_t,U_t)$

$X_{t+1} = X_t - W_t$

If U = 910 the probability that the state evolves to the next state is P_new = 1 and stays in the same state with probability (1-P_new).

If U = 920 the probability that the state evolves to the next state is P_new = 0.8465 and stays in the same state with probability (1-P_new).

If U = 930 the probability that the state evolves to the next state is P_new = 0.7083 and stays in the same state with probability (1-P_new).

If U = 940 the probability that the state evolves to the next state is P_new = 0.5839 and stays in the same state with probability (1-P_new).

If U = 950 the probability that the state evolves to the next state is P_new = 0.4720 and stays in the same state with probability (1-P_new).

If U = 960 the probability that the state evolves to the next state is P_new = 0.3713 and stays in the same state with probability (1-P_new).

If U = 970 the probability that the state evolves to the next state is P_new = 0.2806 and stays in the same state with probability (1-P_new).

If U = 980 the probability that the state evolves to the next state is P_new = 0.1990 and stays in the same state with probability (1-P_new).

If U = 990 the probability that the state evolves to the next state is P_new = 0.1256 and stays in the same state with probability (1-P_new).

If U = 1000 the probability that the state evolves to the next state is P_new = 0.0595 and stays in the same state with probability (1-P_new).