Name: Key   **Id#**

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COE 405, Term 021

Design & Modeling of Digital Systems

Quiz# 4

Date: Saturday, Dec. 21, 2002

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Q.1.   Write a function **SQUARE** that receives an unconstrained Bit_Vector and returns its square value as a Bit_vector. Assume that the returned bit_vector size is equal to the input size. The declaration of the function should be as shown below:

Function Square (x: bit_vector) Return bit_vector is

```
Function Square (x: bit_vector) Return bit_vector is
variable temp: integer;
variable temp2: bit_vector(x'range);
begin
        temp := 0;
        For I IN x'RANGE Loop
                If x(I) = '1' then
                        temp := temp + 2**I;
                End if;
        End Loop;
        temp := temp * temp;
        For I IN 0 To (x'Length - 1) Loop
                If ( temp MOD 2 = 1) Then
                        temp2(I) := '1';
                Else temp2(I) := '0';
                End If;
                temp := temp / 2;
        End Loop;
    return temp2;
end Square;
```