```
 1  --PACKAGE FOR DIF_IFFT_8PT
 2  library IEEE;                                          --IMPORTING LIBRARY
 3  use IEEE.std_logic_1164.all;
 4  use IEEE.MATH_REAL.ALL;                                --USING MATH_REAL LIBRARY
 5  ------------------------------------------------------------------------------------
    ----------------------
 6  package dif_ifft_pkg is                                --PACKAGE DECLARATION
 7  type complex is                                        --DEFINING A DATA STRUCTURE
 8      record                                             --DEFINING RECORD
 9          r : real;
10          i : real;
11      end record;
12  type ar is array (0 to 7) of complex;                  --DECALRING AN ARRAY OF TYPE
    COMPLEX OF LENGTH = 8
13  type ar2 is array (0 to 3) of complex;                 --DECLARING AN ARRAY OF TYPE
    COMPLEX OF LENGTH = 4
14
15  function add (n1,n2 : complex) return complex;         --FUNCTION DECLARATION OF
    ADDITION
16  function sub (n1,n2 : complex) return complex;         --FUNCTION DECLARATION OF
    SUBSTRACTION
17  function multi (n1,n2 : complex) return complex;       --FUNCTION DECLARATION OF
    MULTIPLICATION
18
19  end dif_ifft_pkg;
20  ------------------------------------------------------------------------------------
    ----------------------
21  ------------------------------------------------------------------------------------
    ----------------------
22  package body dif_ifft_pkg is                           --START OF PACKAGE BODY
23
24  ------------------------------------------------------------------------------------
    -------
25  --FUNCTION FOR ADDITION
26  function add (n1,n2 : complex) return complex is
27  variable s : complex;                                  --VARIABLE DECLARATION
28  begin
29  s.r:=n1.r + n2.r;                                      --ADDITION OF REAL PARTS
30  s.i:=n1.i + n2.i;                                      --ADDITOIN OF IMAGINARY
    PARTS
31  return s;                                              --RETURNING SUM
32  end add;
33  ------------------------------------------------------------------------------------
    -------
34
35
36  ------------------------------------------------------------------------------------
    -------
37  --FUNCTION FOR SUBSTRACTION
38  function sub (n1,n2 : complex) return complex is
39  variable d : complex;                                  --VARIABLE DECLARATION
40  begin
41  d.r:=n1.r - n2.r;                                      --SUBSTRACTING REAL PARTS
42  d.i:=n1.i - n2.i;                                      --SUBSTRACTING IMAGINARY PARTS
43  return d;                                              --RETURNING SUBSTRACTED VALUE
44  end sub;
45  ------------------------------------------------------------------------------------
```

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46
47
48  ------------------------------------------------------------------------------------
    -------
49  --FUNCTION FOR MULTIPLICATION.
50  function multi (n1,n2 : complex) return complex is
51  variable p : complex;                                   --VARIABLE DECLARATION
52  begin
53  p.r:=(n1.r * n2.r) - (n1.i * n2.i);                     --MULTIPLYING REAL WITH
    IMAGINARY VALUE
54  p.i:=(n1.r * n2.i) + (n1.i * n2.r);                     --MULTIPLYING IMAGINARY PARTS
55  return p;                                               --RETURNING MULTIPLIES VALUE
56  end multi;
57  ------------------------------------------------------------------------------------
    -------
58  end dif_ifft_pkg;                                       --END OF PACKAGE BODY
59  ------------------------------------------------------------------------------------
    -------
60
```