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**Kode Asisten** .....  
**Jenis Tugas** TP/CS.....

## Jawaban

### 1. Code

```
library IEEE;
use IEEE.STD_LOGIC_1164.ALL;
use IEEE.NUMERIC_STD.ALL;
use IEEE.MATH_REAL.ALL;

entity TP_PSD7_EdgrantHendersonSuryajaya_2206025016 is
    port (
        CLK : in std_logic;
        Done : out std_logic;
        averageTemperature, dailyTemperatureChange, averageBranch,
        dailyBranchChange : in integer;
        numberOfDays : in integer
    );
end TP_PSD7_EdgrantHendersonSuryajaya_2206025016;

architecture rtl of TP_PSD7_EdgrantHendersonSuryajaya_2206025016 is
begin
    process
        variable seed1: integer := 1519;
        variable seed2: integer := 9329;
        --function IntroduceVariant
        impure function IntroduceVariant return integer is
            variable r : real;
        begin
            uniform(seed1, seed2, r);
            return integer(round(r * real(5)));
        end function;

        --function CalculateTemperature
```



```
function CalculateTemperature(averageTemperature, dailyTemperatureChange,
introduceVariant : integer) return integer is
    variable dailyTemperature : integer range 100 to 500;
begin
    dailyTemperature := averageTemperature + dailyTemperatureChange +
(introduceVariant * dailyTemperatureChange);
    return dailyTemperature;
end function;

--function CalculateBranch
function CalculateBranch(averageBranch, dailyBranchChange,
introduceVariant : integer) return integer is
    variable dailyBranch : integer range 0 to 100;
begin
    dailyBranch := averageBranch + dailyBranchChange + (introduceVariant
* dailyBranchChange);
    return dailyBranch;
end function;

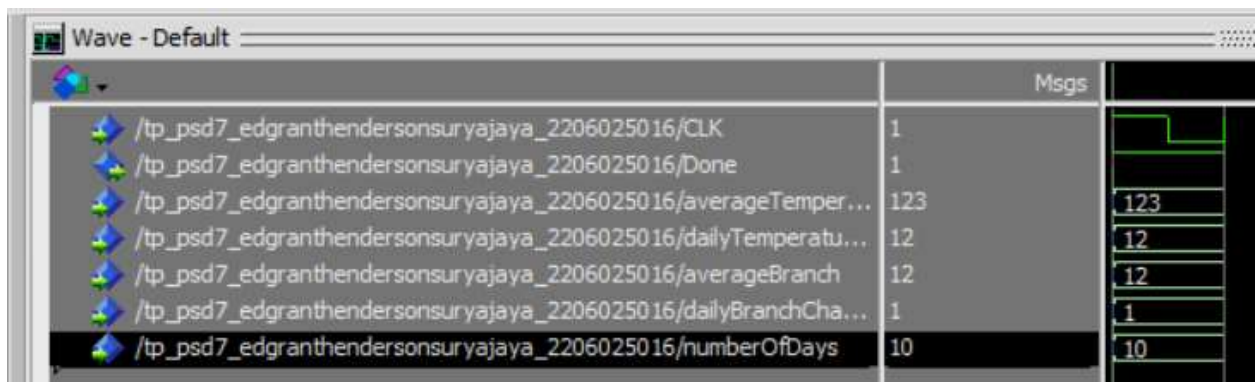
--procedure simulasi
procedure SimulateSacredTimeline(
    signal numberOfDays, averageTemperature, dailyTemperatureChange,
averageBranch, dailyBranchChange : in integer;
    signal CLK : in std_logic;
    signal Done : out std_logic
) is
    variable dailyTemperature, dailyBranch : integer;
begin
    Done <= '0';
    for i in 1 to numberOfDays loop
        dailyTemperature := CalculateTemperature(averageTemperature,
dailyTemperatureChange, IntroduceVariant);
        dailyBranch := CalculateBranch(averageBranch, dailyBranchChange,
IntroduceVariant);
        report "dailyTemperature = " & integer'image(dailyTemperature);
        report "dailyBranch = " & integer'image(dailyBranch);
        -- wait until rising_edge(CLK);
    end loop;
    Done <= '1';
wait;
```

```

        end procedure;
begin
    SimulateSacredTimeline(numberOfDays, averageTemperature,
dailyTemperatureChange, averageBranch, dailyBranchChange, CLK, Done);
    end process;
end rtl;

```

## 2. Simulasi.



Wave - Default		Msgs
/tp_psd7_edgranthendersonsuryajaya_2206025016/CLK	1	
/tp_psd7_edgranthendersonsuryajaya_2206025016/Done	1	
/tp_psd7_edgranthendersonsuryajaya_2206025016/averageTemper...	123	123
/tp_psd7_edgranthendersonsuryajaya_2206025016/dailyTemperatu...	12	12
/tp_psd7_edgranthendersonsuryajaya_2206025016/averageBranch	12	12
/tp_psd7_edgranthendersonsuryajaya_2206025016/dailyBranchCha...	1	1
/tp_psd7_edgranthendersonsuryajaya_2206025016/numberOfDays	10	10

```

# ** Note: dailyTemperature = 183
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyBranch = 15
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyTemperature = 183
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyBranch = 16
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyTemperature = 171
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyBranch = 13
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyTemperature = 171
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyBranch = 16
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyTemperature = 159
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyBranch = 15
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyTemperature = 171
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016

```

```
# ** Note: dailyBranch = 15
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyTemperature = 159
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyBranch = 15
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyTemperature = 171
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyBranch = 14
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyTemperature = 183
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyBranch = 16
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyTemperature = 159
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
# ** Note: dailyBranch = 17
#   Time: 0 ps Iteration: 0 Instance: /tp_psd7_edgranthendersonsuryajaya_2206025016
```

3. Data random menggunakan uniform yang menerima 3 parameter. 2 seed, yang akan digunakan untuk generate pseudo randomnya dan juga setelah digunakan akan diubah. Dan juga parameter yang berbentuk suatu variabel yang akan diisi angka pseudo random dari 0 ke 5.