Algorithm 1: PF2D2BA (Priority First, Fairness and Data Demand based Bandwidth Allocation)

Input: T, $\{\tilde{T_1}, \tilde{T_2}, ...\tilde{T_m}\}$, $\{w_1, w_2, ...w_m\}$
Output: $\{\tilde{t_1}, \tilde{t_2}, ...\tilde{t_m}\}$
-sort $\tilde{T_i}$ according to priority levels from the highest, for each level in ascending order;
-**Initialisation:** $T_{Total} = T$, B_{prio}= Set indexes CurrentPrio,
B= Set indexes AllClients - B_{prio}, $A = \emptyset$, $k_{Total} = k_{prio} = 1$,
CountPrio=nbClients(B_{prio}), m_{prio}=index last client (currentPrio);
- $t_{B_{prio}} = T_{Total}/CountPrio$;
- **while** $k_{Total} \leq m$ **do**
  - **while** $k_{prio} \leq m_{prio}$ **do**
    - **if** $\tilde{T}_{k_{prio}} > t_{B_{prio}}$ **then**
      - Break;
    - **else**
      - $A = A + \{k_{prio}\}, B_{prio} = B_{prio} - \{k_{prio}\}, \tilde{t}_{k_{prio}} = \tilde{T}_{k_{prio}}, T_{Total} = T_{Total} - \tilde{T}_{k_{prio}}$, CountPrio=CountPrio-1,
      - $k_{prio} = k_{prio} + 1, k_{Total} = k_{Total} + 1,\ t_{B_{prio}} = T_{Total}/CountPrio$;
  - **if** $k_{prio} > m_{prio}$ **then**
    - CurrentPrio=NextPrio, B_{prio}= Set indexes CurrentPrio, B= B- B_{prio} , m_{prio} =index last client (currentPrio), CountPrio=nbClients(B_{prio}) ;
  - **else**
    - **for** $i \in B_{prio}$ **do**
      - $\tilde{t}_i = t_{B_{prio}}, T_{Total} = T_{Total} - t_{B_{prio}}$,
    - **if** $T_{Total} = 0$ *and* $B \neq \emptyset$ **then**
      - **for** $j = k_{prio}$ *to* m **do**
        - $\tilde{t}_j = 0$, AddWaitingWork($T_{j1}, T_{j2}, ..., T_{jM}, w_j$) ;
    - break;