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Enrolment Number: BT21GCS057

Section: B2

Q.) WAP to simulate Round Robin Scheduling algorithm.

Ans.)

from collections import deque

class Process:

    def \_\_init\_\_(self, pid, arrival\_time, burst\_time):

        self.pid = pid

        self.arrival\_time = arrival\_time

        self.burst\_time = burst\_time

        self.remaining\_time = burst\_time

        self.completion\_time = 0

        self.response\_time = 0

        self.waiting\_time = 0

    def \_\_repr\_\_(self):

        return f"Process(pid={self.pid}, arrival\_time={self.arrival\_time}, burst\_time={self.burst\_time})"

def round\_robin(processes, quantum):

    queue = deque(processes)

    current\_time = 0

    n = len(processes)

    completed = []

    while queue:

        process = queue.popleft()

        if process.remaining\_time <= quantum:

            current\_time += process.remaining\_time

            process.remaining\_time = 0

        else:

            current\_time += quantum

            process.remaining\_time -= quantum

            queue.append(process)

        if process.remaining\_time == 0:

            process.completion\_time = current\_time

            process.waiting\_time = process.completion\_time - process.arrival\_time - process.burst\_time

            process.response\_time = process.completion\_time - process.arrival\_time

            completed.append(process)

    tat\_sum = 0

    wt\_sum = 0

    rt\_sum = 0

    rd\_sum = 0

    for process in completed:

        tat\_sum += process.completion\_time - process.arrival\_time

        wt\_sum += process.waiting\_time

        rt\_sum += process.response\_time

        rd\_sum += process.burst\_time / process.response\_time

        print(f"Process {process.pid}: TAT={process.completion\_time - process.arrival\_time}, WT={process.waiting\_time}, RT={process.response\_time}, RD={process.burst\_time / process.response\_time:.2f}")

    tat\_avg = tat\_sum / n

    wt\_avg = wt\_sum / n

    rt\_avg = rt\_sum / n

    rd\_avg = rd\_sum / n

    print(f"\nAverage TAT: {tat\_avg:.2f}")

    print(f"Average WT: {wt\_avg:.2f}")

    print(f"Average RT: {rt\_avg:.2f}")

    print(f"Average RD: {rd\_avg:.2f}")

# Example usage:

processes = [

    Process(1, 0, 8),

    Process(2, 1, 4),

    Process(3, 2, 9),

    Process(4, 3, 5),

    Process(5, 4, 2)

]

quantum = 3

round\_robin(processes, quantum)

Output:

