**Assignment 3.3**

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**Div**: CS B SY

**Batch**: 3

1. **Dining Philosopher**

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| #!/bin/bash  # Number of philosophers  NUM\_PHILOSOPHERS=5  # Array to store the forks, initialized as available (1)  forks=()  # Initialize forks as available  for ((i=0; i<$NUM\_PHILOSOPHERS; i++)); do      forks[$i]=1  done  # Function to simulate a philosopher's behavior  philosopher() {      local id=$1      local left\_fork=$id      local right\_fork=$(( ($id + 1) % $NUM\_PHILOSOPHERS ))      echo "Philosopher $id is thinking."      while true; do          echo "Philosopher $id is hungry."          # Try to pick up forks          if [[ ${forks[$left\_fork]} -eq 1 && ${forks[$right\_fork]} -eq 1 ]]; then              forks[$left\_fork]=0              forks[$right\_fork]=0              echo "Philosopher $id picked up forks $left\_fork and $right\_fork and is eating."              sleep 2  # Simulate eating              echo "Philosopher $id finished eating and puts down forks $left\_fork and $right\_fork."              forks[$left\_fork]=1              forks[$right\_fork]=1          else              echo "Philosopher $id couldn't pick up forks, will retry later."          fi          echo "Philosopher $id is thinking."          sleep 1  # Simulate thinking      done  }  # Create processes for each philosopher  for ((i=0; i<$NUM\_PHILOSOPHERS; i++)); do      philosopher $i &  done  # Wait for all philosopher processes to finish  wait |

**Output:**

