**Assignment 3.1**

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1. **Producer Consumer Problem**

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| #!/bin/bash  BUFFER\_SIZE=10  NUM\_ITEMS=20  BUFFER=()  INDEX=0  produce\_item() {      local item=$RANDOM      BUFFER[$INDEX]=$item      INDEX=$(( (INDEX + 1) % BUFFER\_SIZE ))      echo "Produced item: $item"  }  consume\_item() {      local item=${BUFFER[INDEX]}      BUFFER[$INDEX]=""      INDEX=$(( (INDEX + 1) % BUFFER\_SIZE ))      echo "Consumed item: $item"  }  producer() {      for ((i = 0; i < NUM\_ITEMS; i++)); do          produce\_item      done  }  consumer() {      for ((i = 0; i < NUM\_ITEMS; i++)); do          consume\_item      done  }  producer & consumer  wait |

**Output:**

