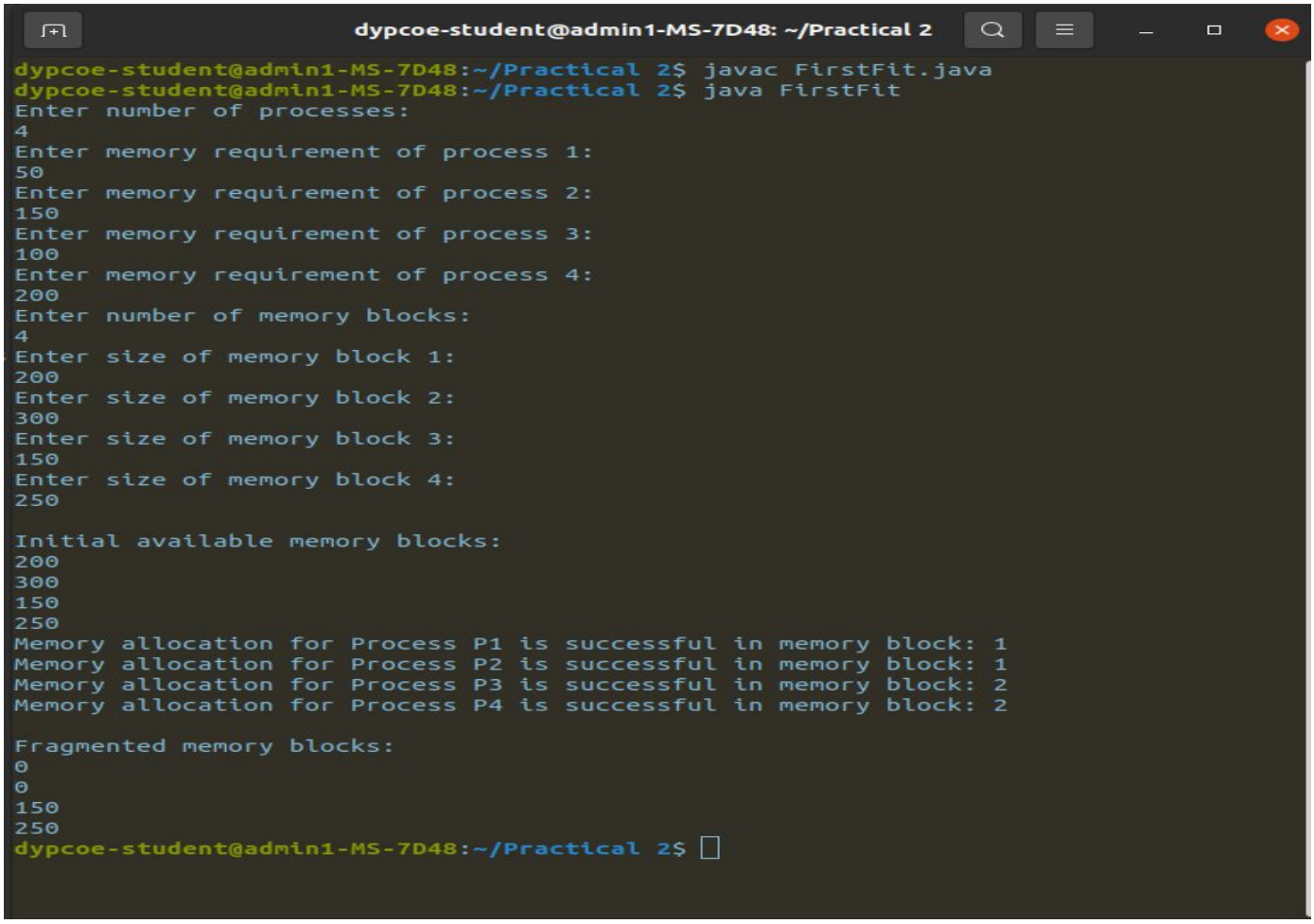
Memory Placement Stratergies

1. First Fit -

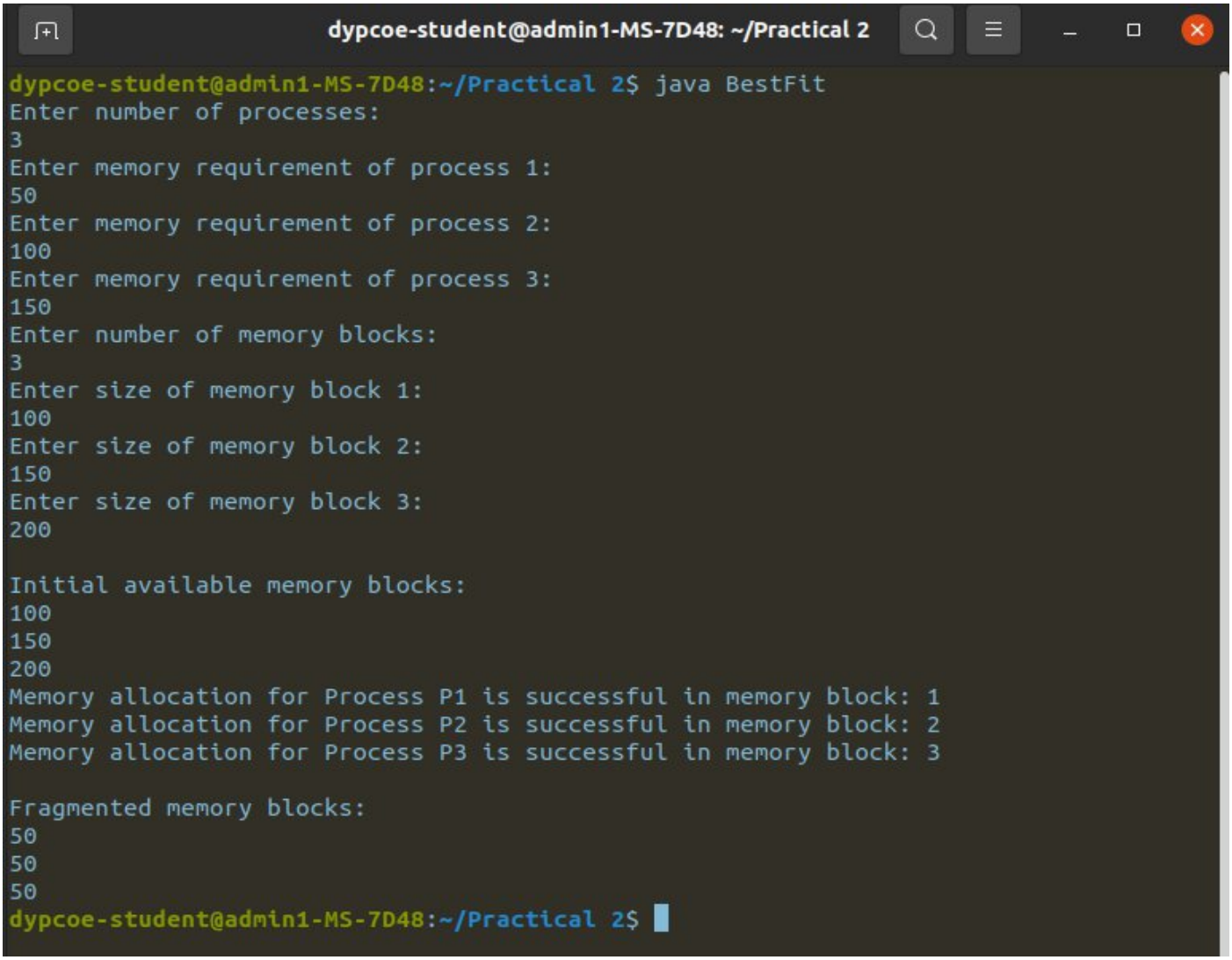
```
import java.util.Scanner;


public class FirstFit{
   public static void main(String[] args){
      Scanner sc = new Scanner(System.in);
      System.out.println("Enter number of processes: ");
      int numP = sc.nextInt();
      int arr[] = new int[numP];
      for(int i=0; i<numP; i++){
         System.out.println("Enter memory requirement of process " + (i+1)+": " );
         arr[i] = sc.nextInt();
      }


      System.out.println("Enter number of memory blocks: ");
      int numB = sc.nextInt();
      int memory[] = new int[numB];
      for(int i=0; i<numB; i++){
         System.out.println("Enter size of memory block " + (i+1)+": " );
         memory[i] = sc.nextInt();
      }


      System.out.println();
      System.out.println("Initial available memory blocks: ");
      for(int i=0; i<numB; i++){
         System.out.println(memory[i] + " ");
      }


      //allocating memory
      for(int i=0; i<numP; i++){
         boolean allocated = false;
         int allocatedWhere = -1;
         for(int j=0; j<numB; j++){
            if(memory[j] >= arr[i]){
               memory[j] -= arr[i];
               allocated = true;
               allocatedWhere = j;
               break;
            }
         }
         if(allocated){
            System.out.println("Memory allocation for Process P" + (i+1) + " is successful in memory block: " + (allocatedWhere + 1));
         }
         else{
            System.out.println("Memory allocation for Process P" + (i + 1 ) + " is unsuccessful ");
         }
      }


      System.out.println();
      System.out.println("Fragmented memory blocks: ");
      for(int i=0; i<numB; i++){
         System.out.println(memory[i] + " ");
      }
   }
}
```



2. Best Fit -

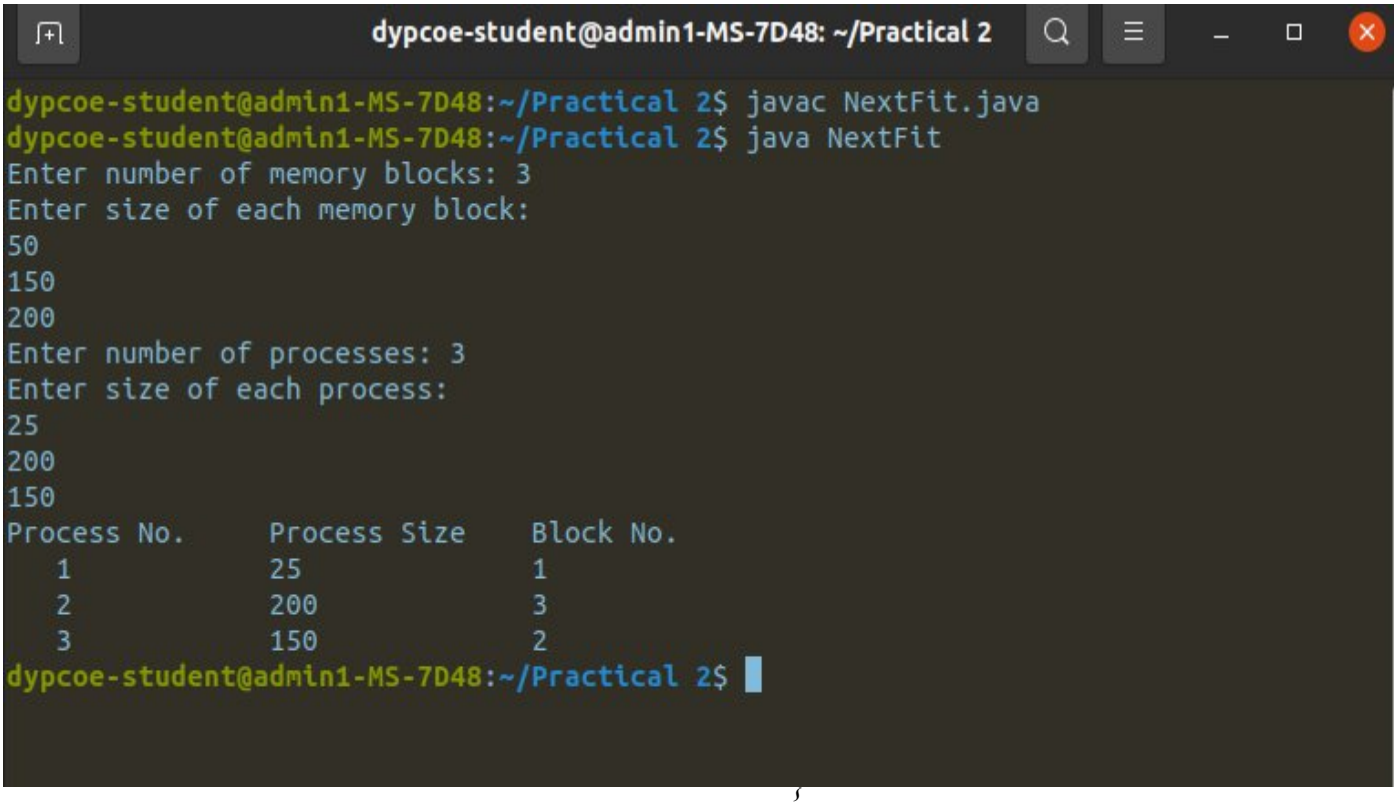
```
import java.util.*;


public class BestFit{
   public static void main(String[] args){
      Scanner sc = new Scanner(System.in);
      System.out.println("Enter number of processes: ");
      int numP = sc.nextInt();
      int arr[] = new int[numP];
      for(int i=0; i<numP; i++){
         System.out.println("Enter memory requirement of process " + (i+1)+": " );
         arr[i] = sc.nextInt();
      }


      //sorting
      Arrays.sort(arr);


      System.out.println("Enter number of memory blocks: ");
      int numB = sc.nextInt();
      int memory[] = new int[numB];
      for(int i=0; i<numB; i++){
         System.out.println("Enter size of memory block " + (i+1)+": " );
         memory[i] = sc.nextInt();
      }


      System.out.println();
      System.out.println("Initial available memory blocks: ");
      for(int i=0; i<numB; i++){
         System.out.println(memory[i] + " ");
```

```
}


//allocating memory
for(int i=0; i<numP; i++){
boolean allocated = false;
int allocatedWhere = -1;
   for(int j=0; j<numB; j++){
      if(memory[j] >= arr[i]){
         memory[j] -= arr[i];
         allocated = true;
         allocatedWhere = j;
         break;
      }
   }
   if(allocated){
            System.out.println("Memory allocation for Process P" + (i+1) + " is successful in memory block: " + (allocatedWhere + 1));
         }
         else{
            System.out.println("Memory allocation for Process P" + (i + 1 ) + " is unsuccessful ");
         }
      }


      System.out.println();
      System.out.println("Fragmented memory blocks: ");
      for(int i=0; i<numB; i++){
         System.out.println(memory[i] + " ");
      }
     }
}
```



3. Next Fit -

```
import java.util.Scanner;

public class NextFit {

    static void nextFit(int blockSize[], int m, int processSize[], int n) {

        int[] allocation = new int[n];

        for (int i = 0; i < n; i++) {

            allocation[i] = -1;

        }

        int j = 0;

        for (int i = 0; i < n; i++) {

        int count = 0;

        while (count < m) {

            if (blockSize[j] >= processSize[i]) {

                allocation[i] = j;

                blockSize[j] -= processSize[i];

                break;

            }

            j = (j + 1) % m;

            count++;

        }

    }

        System.out.println("Process No.\tProcess Size\tBlock No.");

        for (int i = 0; i < n; i++) {

            System.out.print("   " + (i + 1) + "\t\t" + processSize[i] + "\t\t");

            if (allocation[i] != -1){

    System.out.println(allocation[i] + 1);

            }
```



}

4. Worst Fit -

```
import java.util.Scanner;


public class WorstFit{
    public static int maxBlock(int[] memory, int sizeReq){
    int maxIndex = -1;
    int maxSize = -1;


    for(int i=0; i<memory.length; i++){
            if(memory[i] > maxSize && memory[i] >= sizeReq){
                maxIndex = i;
                maxSize = memory[i];
            }
    }
    return maxIndex;
}


   public static void main(String[] args){
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter number of processes: ");
        int numP = sc.nextInt();
        int arr[] = new int[numP];
        for(int i=0; i<numP; i++){
            System.out.println("Enter memory requirement of process " + (i+1)+": " );
            arr[i] = sc.nextInt();
        }


        System.out.println("Enter number of memory blocks: ");
        int numB = sc.nextInt();
        int memory[] = new int[numB];
        for(int i=0; i<numB; i++){
            System.out.println("Enter size of memory block " + (i+1)+": " );
            memory[i] = sc.nextInt();
        }
```

```
        System.out.println();
        System.out.println("Initial available memory blocks: ");
        for(int i=0; i<numB; i++){
            System.out.println(memory[i] + " ");
        }

        //allocating memory
        for(int i=0; i<numP; i++){
            int index = maxBlock(memory, arr[i]);
            if(index != -1){
                memory[index] -= arr[i];
                System.out.println("Memory allocation for Process P" + (i+1) + " is successful in memory block: " + (index+1));
            }
            else{
                System.out.println("Memory allocation for Process P" + (i + 1 ) + " is unsuccessful ");
            }
        }

        System.out.println();
        System.out.println("Fragmented memory blocks: ");
        for(int i=0; i<numB; i++){
            System.out.println(memory[i] + " ");
        }
    }
}
```