Random File(성적처리)

경복대학교
소프트웨어융합과
배희호 교수

Random Data 입력

Random Data 입력

- Man.JAVA

```
public class Man {
    private final String hakbun;
    private final String name;

    public Man(String hakbun, String name) {
        this.hakbun = hakbun;
        this.name = name;
    }

    public String getName() {
        return name;
    }

    public String getHakbun() {
        return hakbun;
    }
}
```

Random Data 입력

- Student.JAVA

```
public class Student extends Man{
    private final int kor;
    private final int eng;
    private final int math;

    public Student(String hakbun, String name, int kor, int eng, int math) {
        super(hakbun, name);
        this.kor = kor;
        this.eng = eng;
        this.math = math;
    }

    public int getKor() {
        return kor;
    }
```

Random Data 입력

- Student.JAVA

```
    public int getEng() {
        return eng;
    }

    public int getMath() {
        return math;
    }
}
```

Random Data 입력

- Main.JAVA

```
public class Main {
    public static void main(String[] args) throws IOException {
        final String filename = ".₩₩data₩₩student.dat";

        FileHandler handler = new FileHandler();
        handler.inputData(filename);
    }
}
```

Random Data 입력

- FileHandler.JAVA

```
public class FileHandler {
    private final String[] subject = {"국어", "영어", "수학"};
    private Scanner keyboard;

    public FileHandler() {
        this.keyboard = new Scanner(System.in);
    }

    public void inputData(String filename) throws IOException {
        ArrayList<Student> students = new ArrayList<>();
        while (true) {
            String name;
            String hakbun;
```

Random Data 입력

```
while (true) {
    System.out.printf(" %d번째 학생의 이름(3글자)은 ? ", students.size() + 1);
    name = keyboard.next();
    if (name.length() == 3) {
        break;
    } else {
        System.err.println("이름을 정확하게 입력해주세요");
        System.in.read();
    }
}
while (true) {
    System.out.printf(" %s 학생의 학번(7자리)은 ? ", name);
    hakbun = keyboard.next();
    if (hakbun.length() == 7) {
        break;
    } else {
        System.err.println(" 학번 오류 입니다.");
        System.in.read();
    }
}
```

Random Data 입력

- FileHandler.JAVA

```
        int kor = input(name, subject[0]);
        int eng = input(name, subject[1]);
        int math = input(name, subject[2]);
        students.add(new Student(hakbun, name, kor, eng, math));
        char answer;
        while (true) {
            System.out.print("₩n   계속 입력 하시겠습니까 ? (Yes/No) ");
            answer = keyboard.next().charAt(0);
            if (answer == 'Y' || answer == 'y' || answer == 'N' || answer == 'n') {
                break;
            } else
                System.out.print("응답을 Yes/No로 하세요");
        }
        if (answer == 'N' || answer == 'n') {
            System.out.printf(" %d명을 입력했습니다₩n", students.size());
            break;
        }
    }
```

Random Data 입력

- FileHandler.JAVA

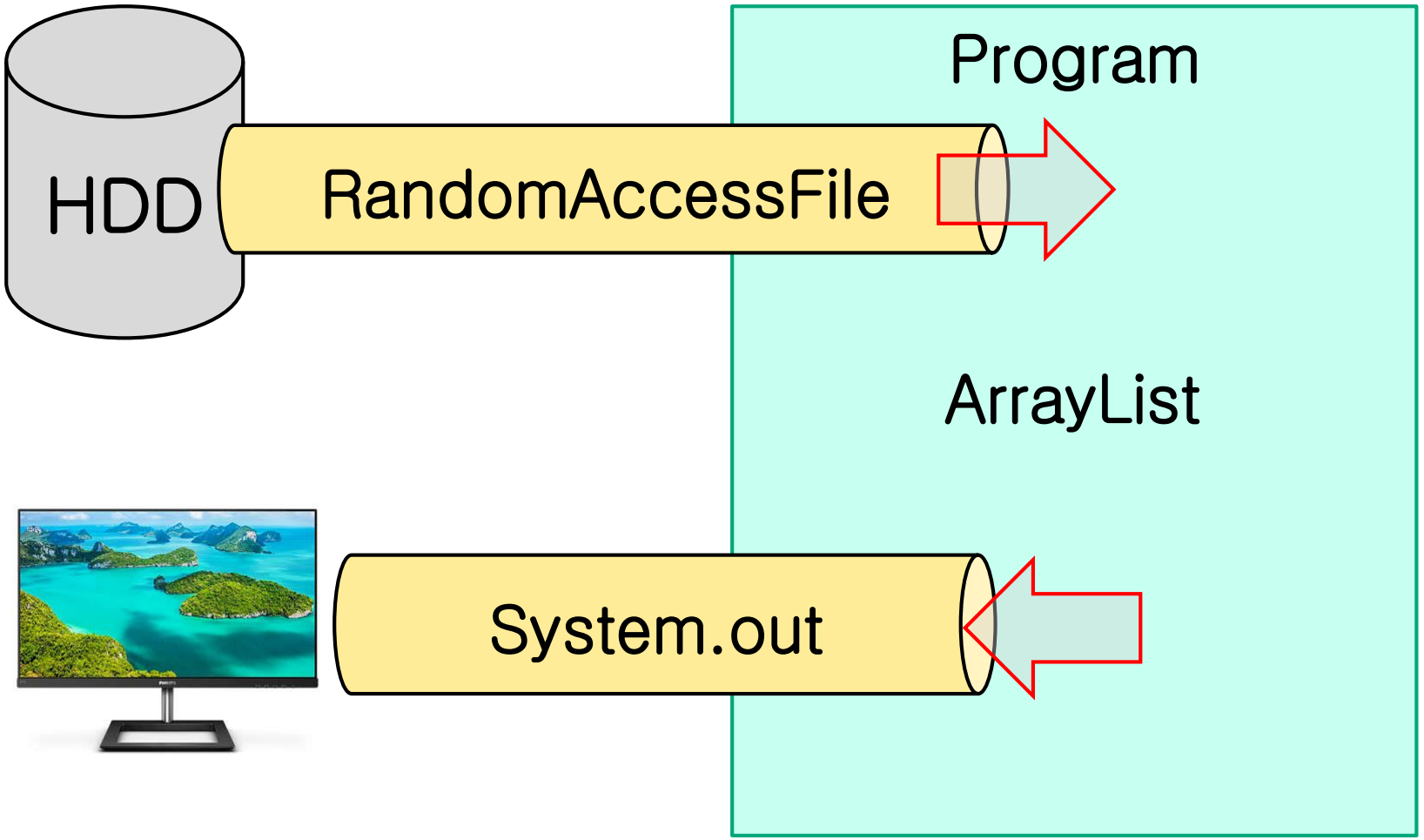
```
    RandomAccessFile output = new RandomAccessFile(filename, "rw");
    for (int i = 0; i < students.size(); i++) {
        output.writeUTF(students.get(i).getHakbun());
        output.writeUTF(students.get(i).getName());
        output.writeInt(students.get(i).getKor());
        output.writeInt(students.get(i).getEng());
        output.writeInt(students.get(i).getMath());
    }
    output.close();
}
```

Random Data 입력

- FileHandler.JAVA

```
    private int input(String name, String s) throws IOException {
        int jumsu;
        while (true) {
            System.out.printf(" %s 학생의 %s 성적 입력 : ", name, s);
            jumsu = keyboard.nextInt();
            if (jumsu >= 0 && jumsu <= 100) {
                break;
            } else {
                System.err.printf(" %s 성적 입력 오류 (0점 ~ 100점)₩n", s);
                System.in.read();
            }
        }
        return jumsu;
    }
}
```

Random Data 처리



Random Data 처리

- Man.JAVA

```
public class Man {
    private String hakbun;
    private String name;

    public Man(){}

    public void setHakbun(String hakbun) {
        this.hakbun = hakbun;
    }

    public void setName(String name) {
        this.name = name;
    }

    public String toString() {
        return String.format(" %7s %3s", hakbun, name);
    }
}
```

Random Data 처리

- Student.JAVA

```
public class Student extends Man{
    private int kor;
    private int eng;
    private int math;

    public Student() {
        super();
    }

    public void setKor(int kor) {
        this.kor = kor;
    }
    public void setEng(int eng) {
        this.eng = eng;
    }
    public void setMath(int math) {
        this.math = math;
    }
```

Random Data 처리

- Student.JAVA

```
    public int sum() {
        return kor + math + eng;
    }

    public float avg() {
        return sum() / 3.0f;
    }
    @Override
    public String toString() {
        return super.toString() +
        String.format(" %3d %3d %3d %4d %6.2f ", kor, eng, math, sum(), avg());
    }
}
```

Random Data 처리

- FileHandler.JAVA

```
public class FileHandler {

    public ArrayList<Student> readData(String filename) {
        ArrayList<Student> students = new ArrayList<>();
        try {
            RandomAccessFile input = new RandomAccessFile(filename, "rw");
            while (input.getFilePointer() != input.length()) {
                Student student = new Student();
                student.setHakbun(input.readUTF());
                student.setName(input.readUTF());
                student.setKor(input.readInt());
                student.setEng(input.readInt());
                student.setMath(input.readInt());
                students.add(student);
            }
```

Random Data 처리

- FileHandler.JAVA

```
            if (students.size() == 0) {
                System.out.println("데이터가 없습니다.");
                System.exit(-1);
            } else
                System.out.printf("데이터를 성공적으로 %d개 읽었습니다₩n",
                                                        students.size());
            input.close();
        } catch (NullPointerException | IOException e) {
            System.out.println("오류 입니다");
            System.exit(-1);
        }
        return students;
    }
}
```

Random Data 처리

- ClassRoom.JAVA

```
public class ClassRoom {
    private ArrayList<Student> students;

    public ClassRoom(ArrayList<Student> students) {
        this.students = students;
    }

    public void sort() {
        Descending descending = new Descending();
        students.sort(descending);
    }

    private static class Descending implements Comparator<Student> {
        @Override
        public int compare(Student o1, Student o2) {
            return Integer.compare(o2.sum(), o1.sum());
        }
    }
```

Random Data 처리

- ClassRoom.JAVA

```
private int rank(int index) {
    int rank = 1;
    int sum = students.get(index).sum();    // 나의 총
    for (int i = 0; i < students.size(); i++) {
        if (students.get(i).sum() > sum) {
            rank++;          // 나의 총점보다 크면 등수를 더함
        }
    }
    return rank;
}
```

Random Data 처리

- ClassRoom.JAVA

```
public void display() {
    sort();
    System.out.println("₩t₩t       성 적 처 리");
    line();
    System.out.println("   학번    이름  국어 영어 수학 총점   평균   등수");
    line();
    for (int i = 0; i < students.size(); i++) {
        if (i % 5 == 0 && i != 0)
            System.out.println();
        System.out.print(students.get(i));
        System.out.printf("%3d₩n", rank(i));
    }
    line();
}
private void line() {
    System.out.println("*****************************************");
}
}
```