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CODE-

```
import java.util.*;
```

```
public class PrecisionRecallCalculator {
```

```
    public static void main(String[] args) {
```

```
        // Sample input: Retrieved documents (Answer Set A)
```

```
        Set<String> retrievedDocs = new HashSet<>(Arrays.asList("D1", "D2", "D3", "D4"));
```

```
        // Relevant documents for query q1 (Rq1)
```

```
        Set<String> relevantDocs = new HashSet<>(Arrays.asList("D2", "D3", "D5", "D6"));
```

```
        // Calculate precision and recall
```

```
        double precision = calculatePrecision(retrievedDocs, relevantDocs);
```

```
        double recall = calculateRecall(retrievedDocs, relevantDocs);
```

```
        // Print results
```

```
        System.out.printf("Precision: %.2f\n", precision);
```

```
        System.out.printf("Recall: %.2f\n", recall);
```

```
    }
```

```
    public static double calculatePrecision(Set<String> retrieved, Set<String> relevant)
```

```
    { Set<String> intersection = new HashSet<>(retrieved);
```

```
      intersection.retainAll(relevant); //  $A \cap R$ 
```

```
      if (retrieved.isEmpty()) return 0.0;
```

```
      return (double) intersection.size() / retrieved.size();
```

```
    }
```

```
    public static double calculateRecall(Set<String> retrieved, Set<String> relevant) {
```

```

        Set<String> intersection = new HashSet<> (retrieved);

        intersection.retainAll(relevant); //  $A \cap R$ 

        if (relevant.isEmpty()) return 0.0;

        return (double) intersection.size() / relevant.size();

    }

}

```

OUTPUT:-

The screenshot shows an IDE window with a Java file named `precision_recall.java`. The code defines a `main` method that takes an array of strings as input. It creates two `HashSet` objects: `retrievedDocs` containing {"D1", "D2", "D3", "D4"} and `relevantDocs` containing {"D2", "D3", "D5", "D6"}. It then calls `calculatePrecision` and `calculateRecall` methods (not shown in the snippet) to compute the precision and recall values. The results are printed using `System.out.printf`.

The terminal output at the bottom of the IDE shows the following results:

```

Precision: 0.50
Recall: 0.50
PS C:\Users\Student\Desktop\isr_lab>

```