Generics Exercise

Part 1: Without using generics

**1. Define the interface NumFilter. The interface has a single method named predicate that takes one Integer argument and returns a boolean value.**

**interface NumFilter {**

**boolean predicate (Integer n);**

**}**

A typical implementation of the predicate method would be as follows:

- returns true if the integer n satisfy the condition of the filter

- else returns false.

**2. Define two classes that represent predicates on Integers, these**

**classes are implementing NumFilter as follows:**

a. OddNumFilter class that predicate all odd numbers.

b. MultipleOfFilter class that predicate all numbers that are multiples of the

Integer provided in the MultipleOfFilter class constructor

**3. Write a NumFilterTest class, in this class**

- Define a static method: **public static void filterData(Integer a[ ],NumFilter filter)** as follows:

i. The method takes an Array of Integer and an instance of the NumFilter as arguments.

ii. The method will iterates on the array elements and print the element value

that satisfy the given filter.

- Write the main method as follows:

a. Define an array of integer of size 20 elements, and store values in this array.

b. Make 3 test for the filterData method on the array as follows:

1. Call the method filterData to filter the values that are multiples of 3.

2. Call the method filterData to filter the values that are multiples of 5.

3. Call the method filterData to filter the values that are odd numbers.

Part2: Using generics

1. **Revise your answers above to use the Filter<T> interface instead.**

interface Filter<T> {

boolean predicate(T n);

}

**2. Define the following classes that implement the Filter interface:**

- EvenNumFilter<Integer> class that predicate all even numbers.

- StartsWithFilter<String> class that predicate all strings that start with a given string provided in the StartsWithFilter<String> constructor.

- StudentAgeFilter<Student> class that predicate all student with age is greater than

the value provided in the StudentAgeFilter constructor.

**3. Define GenericFilterTest class, in this class:**

- Redefine the static method**: public static <T> void filterData(T a[ ] , Filter<T> filter)**

- Test the above generic-filter classes on different suitable arrays by calling the

filterData method.