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QUESTION ONE

CREATE A JAVA PROGRAM THAT WILL COUNT ALL WORDS IN A SENTENCE. THE PROGRAM SHOULD HAVE A MINIMUM OF TWO CLASSES. (40)

1.1) Requirements for the first class:

- The first class should be named class1.
- The main method (starting point). **(5)**
- The object of class2. **(5)**
- It should also call the get method count_words(String str). **(5)**

1.2) Requirements for the second class:

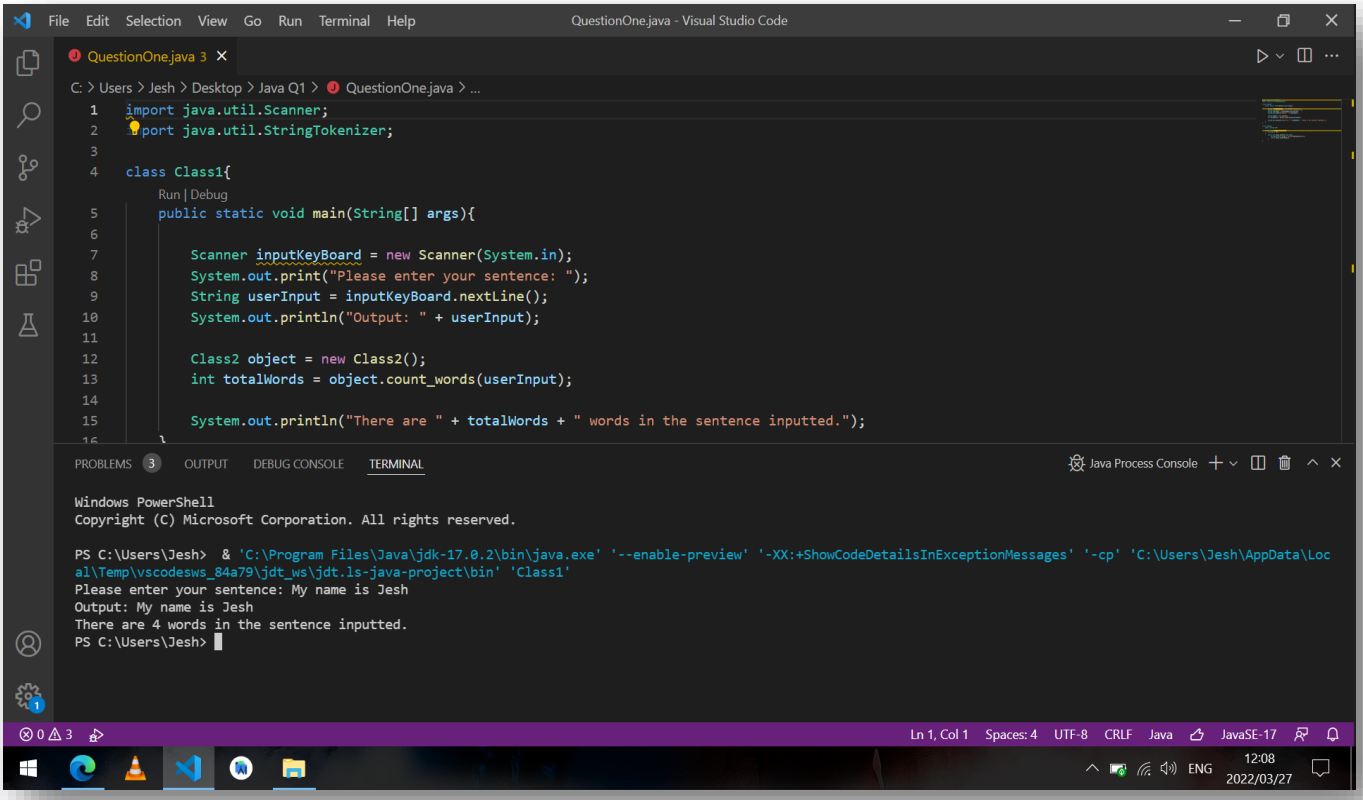
- The second class should be named class2.
- It should have a constructor. **(5)**
- A get method named count_words(String str). **(10)**

Below is the entire code to execute the program:

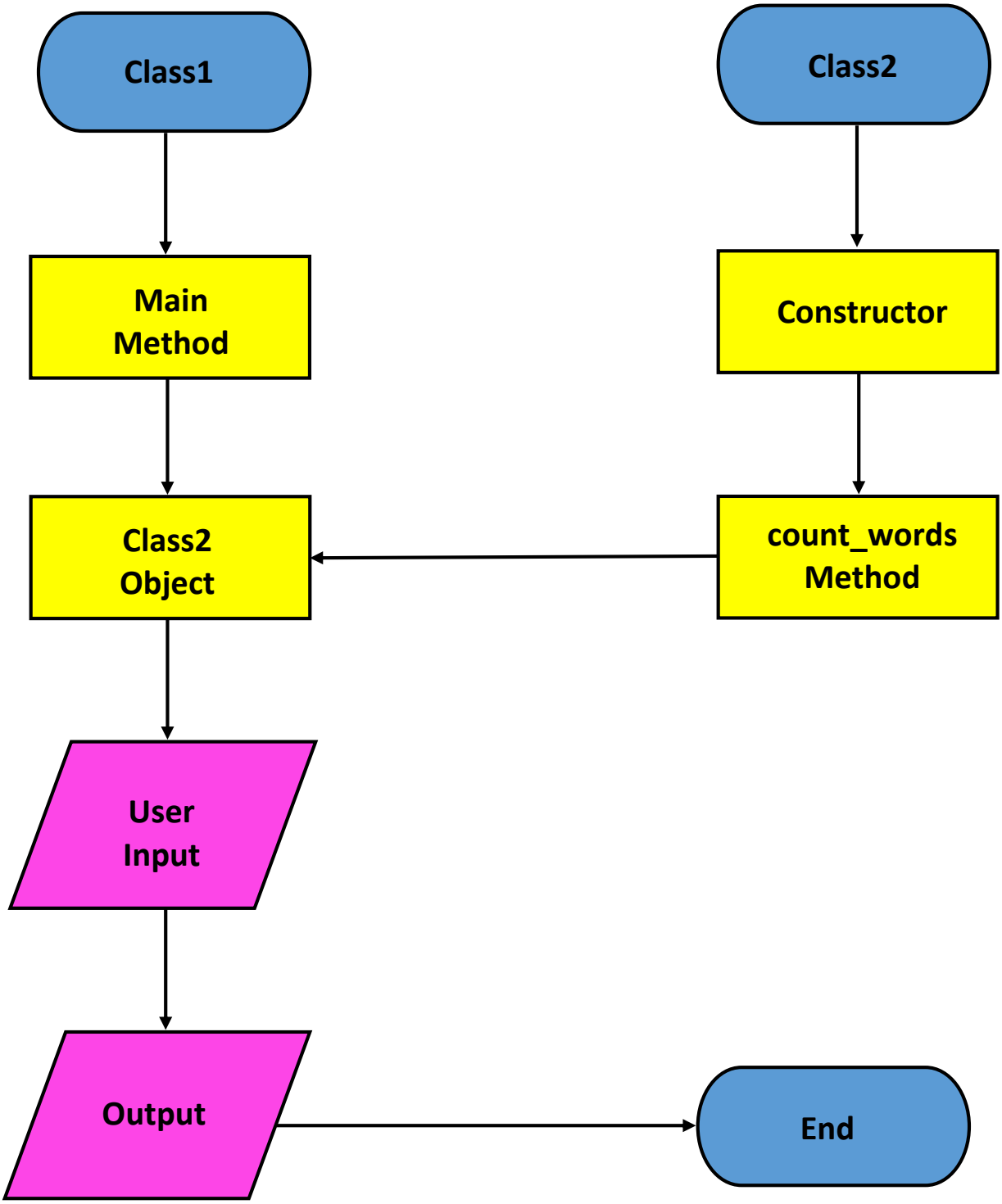
```
import java.util.Scanner;
import java.util.StringTokenizer;

class Class1{
   public static void main(String[] args){

      Scanner inputKeyBoard = new Scanner(System.in);
      System.out.print("Please enter your sentence: ");
      String userInput = inputKeyBoard.nextLine();
      System.out.println("Output: " + userInput);

      Class2 object = new Class2();
      int totalWords = object.count_words(userInput);

      System.out.println("There are " + totalWords + " words in the sentence inputted.");
   }
}

class Class2{
   public String str;

   public void Class2(String str){
      this.str = str;
   }
      public int count_words(String str){
         StringTokenizer words = new StringTokenizer(str);
         return words.countTokens();
```

```
    }
}
```

Below is the output of the code after collecting the data from the user:



1.3) CONSTRUCT A FLOWCHART FOR CLASS1 AND CLASS2 BOTH COMBINED. (10)



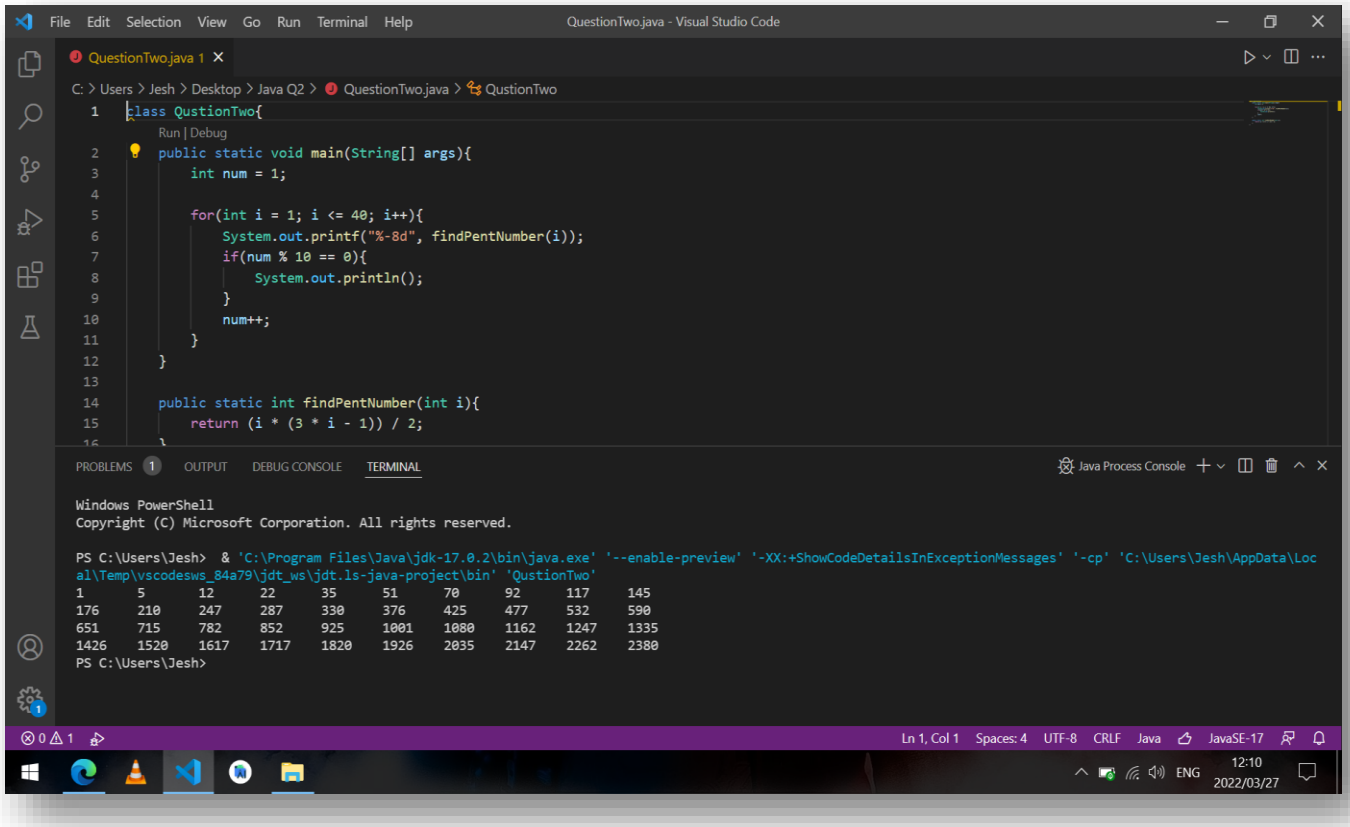
QUESTION TWO

CREATE A JAVA PROGRAM THAT WILL DISPLAY THE FIRST 40 PENTAGONAL NUMBERS. (20)

Below is the entire code to execute the program:

```
class QustionTwo{
   public static void main(String[] args){
      int num = 1;

      for(int i = 1; i <= 40; i++){
         System.out.printf("%-8d", findPentNumber(i));
         if(num % 10 == 0){
            System.out.println();
         }
         num++;
      }
   }

   public static int findPentNumber(int i){
      return (i * (3 * i - 1)) / 2;
   }
}
```

Below is the output of the above code:



QUESTION THREE

WRITE A JAVA PROGRAM THAT WILL COMPUTE THE FUTURE INVESTMENT VALUE AT A GIVEN INTEREST RATE FOR A SPECIFIED NUMBER OF YEARS. THE JAVA PROGRAM SHOULD HAVE A MINIMUM OF TWO CLASSES. (40)

3.1) Requirements for the first class:

- It should the main method (starting point). **(5)**
- It should have the object of **classB**. **(5)**
- It should also call the void method named **futureInvestmentValue (double investmentAmount, double monthlyInterestRate, int years)**. **(15)**

3.2) Requirements for the second class:

- A get method named count_words(String str). **(15)**

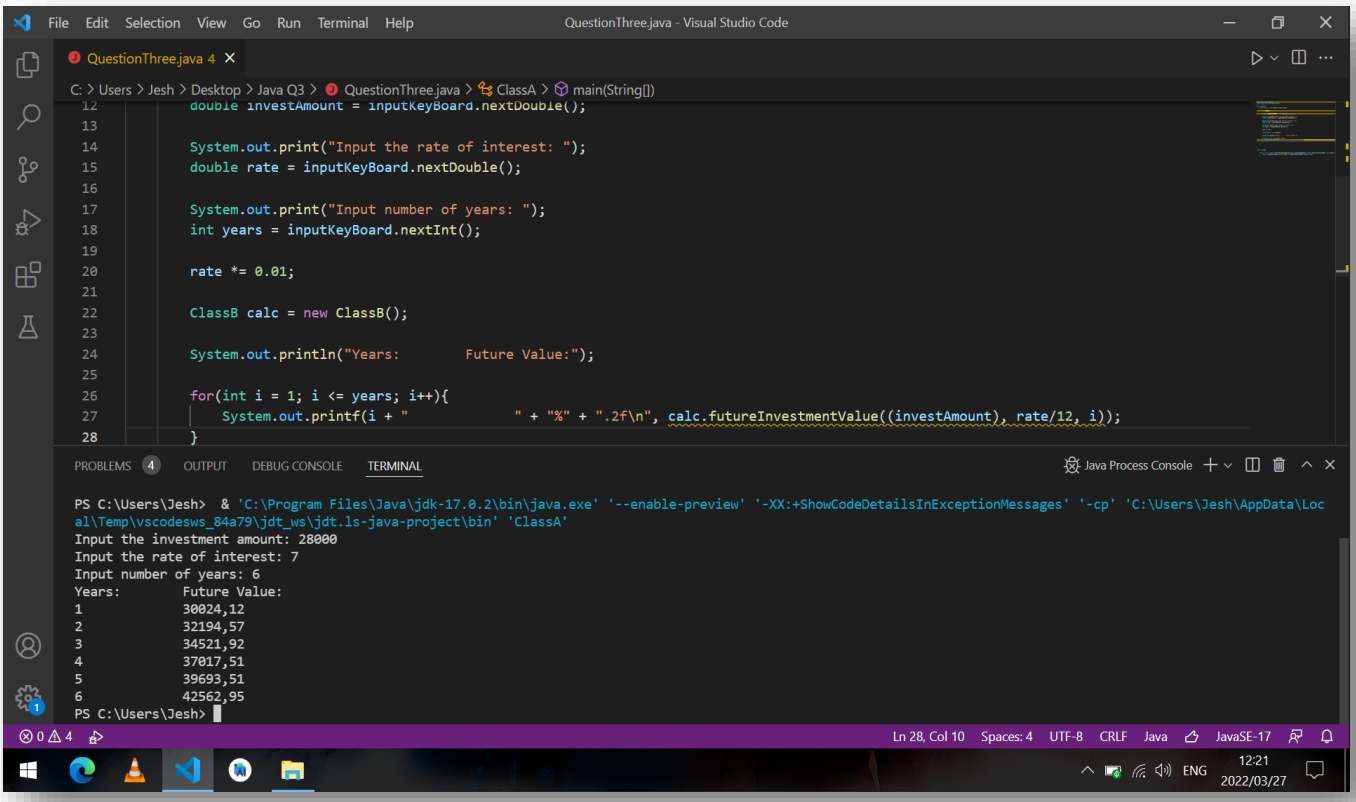
Below is the entire code to execute the program:

```
import java.util.Scanner;
import java.util.StringTokenizer;

class ClassA{
   public static void main(String[] args){

      int number = 1;

      Scanner inputKeyBoard = new Scanner(System.in);

      System.out.print("Input the investment amount: ");
      double investAmount = inputKeyBoard.nextDouble();

      System.out.print("Input the rate of interest: ");
      double rate = inputKeyBoard.nextDouble();

      System.out.print("Input number of years: ");
      int years = inputKeyBoard.nextInt();

      rate *= 0.01;

      ClassB calc = new ClassB();

      System.out.println("Years:       Future Value:");

      for(int i = 1; i <= years; i++){
```

```
        System.out.printf(i + "            " + "%" + ".2f\n", calc.futureInvestmentValue((investAmount),
                                rate/12, i));
      }

    }

}

class ClassB{

    public static double futureInvestmentValue(double investmentAmount, double monthlyInterestRate,
                                                        int years){
        return investmentAmount * Math.pow(1 + monthlyInterestRate, years * 12);
    }

}
```

NB: It was required to have a method called count_words(String str) in classB. However, this program requires the user to enter only integers and not words. This means that we cannot use the count_words(String str) method. Therefore I have moved the method called futureInvestmentValue into classB in order to show the same principle of calling a function from an external class into the main function.

Below is the output of the code after gathering data from the user:



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