Mr. Robinette's AP Computer Science Class

APLesson 08: Recursion

APLesson_08: Recursion

As we learned in previous lessons, a recursive method is a method that calls itself. Previously, we used recursion to check user input to ensure it is correct. But we can also use recursion to create loops. Remember the following count program from Lesson_06...

```
public static void forCount(int to, int by)
   for (int i = by; i \le to; i += by)
       System.out.println(i);
}
```

Below is an example of how we would do the same thing using recursion

```
public static int recurCount(int to, int curr, int by)
{
   if(curr > to)
       return to;
   else
       System.out.println(curr);
       return recurCount(to, curr + by, by);
```

Manipulating Strings with Recursion

```
public static void main(String[]args)
   Scanner kb = new Scanner(System.in);
   System.out.println("Please enter a word: ");
   String word = kb.next();
   wordBox(word, 0);
public static String wordBox(String word, int num)
   if (num >= word.length())
       return "";
```

per5Forum

Forums

- per4Forum
- per3Forum
- per2Forum

```
else
{
     System.out.println(word);
     wordBox(word, num + 1);
}
return "";
```

Mathematical functions with Recursion

```
public static void main(String[]args)
{
    Scanner kb = new Scanner(System.in);
    System.out.println("Please enter a number");
    int number = kb.nextInt();
    System.out.println(recur(number));
}
public static int recur(int n)
{
    if (n == 0)
        return 1;
    else
        return n * recur(n-1);
}
```



APLab_08

Ex_01: Underscores

Write a program that takes the spaces out of sentences and replaces them with underscores.

- 1. main() method Take user input for a sentence
- 2. replace() method

- If a space is not found in sentence
 - return sentence
- Otherwise
 - recursive call to replace(sentence before space + underscore + sentence after space)

Ex_02: Center

Write a program that centers three words together.

- 1. main() method Take user inputs for three words
- 2. makeCenter() method
 - If word length is greater than or equal to 20
 - return the word
 - Otherwise
 - Recursive call to makeCenter(word + one space on each side)
- 3. Run makeCenter 3 times, using each word as a parameter.

Your finished product should look like this....

word1 secondWord absoluteFinalWord

Ex_03: Lucky7s

Write a program that counts the number of 7s in a number.

- 1. main() method Take a user input for a number
- 2. luck() method number as a parameter
 - If number is greater than 0
 - If the right digit is 7
 - return 1 + recursive call to luck(number/10)
 - Otherwise
 - Return 0 + recursive call to luck(number/10)
 - If none of the above are true, return 0

Ex_04: TreeDeg60

Write a program that creates a triangle similar to the ones we did in previous exercises, but at a 60 degree angle.

- 1. main() method take user input for a word
 - Set the stop variable to the length of the word
- 2. tree() method word, start, and stop numbers for parameters
 - if start is less than or equal to stop
 - Print substring from 0 to start
 - Add 1 to start
 - recursive call to tree(word, start, stop)

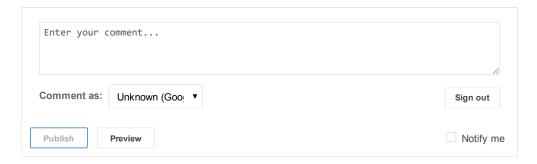
Use print formatting to make your output look like this....

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