Midterm Practice Problems – answers to select problems
Answers appear in boldface.

Part 1. Show your work for partial credit

(a) Consider the following code segment:

```
int p = 30;
int b;

Scanner kbrd = new Scanner (System.in);
System.out.print("Please enter an integer");
b = kbrd.nextInt();

if  (b > p || b < 0 )  {
    p = 2*p;
    b = b/25;
}  
else {
    p = 0;
    b = b%2;
}
```

Assume the user entered 55.

What is the value of variable `p` after the execution of this program segment? 60

What is the value of variable `b` after the execution of this program segment? 2

(b) What will be printed by the following code segment:

```
int a = 35;
int b = 100;
boolean flag = false;

if ( !flag || a > b )
    System.out.println ("One");
else
    System.out.println ("Two");
```

One

(c) Consider the following code segment and show what is printed when it is executed. Show the intermediate values of variables `k` and `s` for partial credit.

```
int k = 1;
int s = 0;

do{
    System.out.print(‘*’);
    if (k % 2 == 1)
        s = s + k;
    k++;
}while ( s < 5 );
```

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(d) Consider the following code segment:

```java
Scanner kbrd = new Scanner(System.in);
String myStr = kbrd.nextLine();
int len = myStr.length();
String result;

if (len <= 3 || myStr.charAt(0) == 'Z') {
    result = "RARE";
} else {
    result = "NOT RARE";
}
```

Show values of variables `len` and `result` after the execution of this program segment for the following user inputs:

- **user enters Zanzibar**
  - `len`: 8
  - `result`: "RARE"

- **user enters Moo**
  - `len`: 3
  - `result`: "RARE"

(f) What will be printed by the following code segment?

```java
int a = 20;
int b = 100;
boolean flag = false;

if (b % a == 0)
    flag = true;

if (!flag) {
    System.out.println("One");
}
else {
    System.out.println("Two");
}
```

Show values of following expressions:

- `b % a`: 0
- `!flag`: `false`
4. Write a complete program that lets a user enter words, computes how many words in the input have the same starting and ending letter. The program must at first read the number of words in the list (n) followed by exactly n words each appearing on a separate line. Then, the program must compute and print how many words start with the same letter as they end with.

For example, given the following user input:
5
Shine
on
you
crazy
diamond

(where 5 is the number of words that follow) the program must print

```
Number of words with matching first and last letter is 1
```

since there is only one word (diamond) with first letter matching the last, and the word “on”, for example, is shorter than the previous word “Shine”.

Here’s another example. For user input
3
one
seven
eighteen

the output should read

```
Number of words with matching first and last letter is 0
```

Your program doesn’t have to contain comments, but must otherwise use good programming style.

```java
public class CalcMatches {
    public static void main(String[] args) {
        System.out.println("Please enter how many words in the list");
        Scanner kbrd = new Scanner(System.in);
        int n = kbrd.nextInt();
        String word = "";
        int numMatching = 0; // to store number of words with matching first/last chars
        int i = 0;
        while (i < n) {
            System.out.println("Please enter the next word");
            word = kbrd.nextLine();
            // compute the position of last character in word
            int lastPos = word.length() - 1;
            // check if first and last chars are same
            if (word.charAt(0) == word.charAt(lastPos))
                numMatching++;// increase numMatching by 1
            i++;
        }
        System.out.println(numMatching);
    }
}
```