Objectives: Writing Nested ifs. Example Exam Question
Deadlines: *MP2 "Hollywood" due Monday 8pm*
MP1 will be graded Fri night (99%)
& once more Monday 8pm (98%)
Midterm I: Wed 2/20th 7pm . Conflict? Thu 21st 7pm.
Conflict sign up posted tomorrow via email /Piazza.

1. Ahoy! Be a human compiler! Decompose the following expression into a sequence of three or four simple steps that the Virtual machine might execute. Watch out for the *type* conversions. Math.random() returns a number of type double between 0.0 and 0.99999999...

```
(int) (Math.random() * 6)
```

2. Why are the three pairs of brackets necessary?

3. List the possible values of the above expression:

4. Homer Simpson claims that the following method works as described. Is he correct?
Justify and smartly discuss your answer with another student.

```
/** Rolls two simulated 6 sided dice until both die values are equal to one.
* Prints out the number of times the dice were rolled.
* @return the dice roll encoded as an integer value. */
public static int rollSnakeEyes() {
   int dice1 = 0, dice2 = 0;
   int count = 1;
   boolean foundSolution = false;
   while (!foundSolution) {
     dice1 = 1 + (int) (Math.random() * 6);
     dice2 = 1 + (int) (Math.random() * 6);
     foundSolution = dice1 + dice2 == 2;
     count++;
   }
  TextIO.putln("That took " + count + " rolls");
  return dice1 + 10 * dice2;
}
```

5. Modify the code below to roll three dice. It should keep rolling until the dice values are unique. You'll need to i) create a new variable (dice3) ii) roll dice 3 iii) change the foundSolution expression and iv) the return expression should represent the number of iterations required.

```
/** Rolls three simulated 6 sided dice until all die values are unique.
public static int rollThreeUniqueDice() {
   int dice1 = 0, dice2 = 0;


   boolean foundSolution = false;
   while (!foundSolution) {
     dice1 = 1 + (int) (Math.random() * 6);
     dice2 = 1 + (int) (Math.random() * 6);




    }
}
```

Two common ways to nest if statements:

```
//As a picture?
if( inChicago ) {
  if( withFriends ) {
    goDownTown();
  } else {
    callFriends();
    goDownTown();
  }
else {
   if(withFriends) {
      watchMovieTogether();
   } else {
      watchTV();
   }
}
```

```
//As a picture?
if(inChicago)
   goDownTown();

else if(inWisconsin)
   goSkiing();

else if(inNYC )
   eatBagel();

else browseFB();
```

6. (Sneak Peak at MP3) Complete & fix the bugs in the following code:

```
public static
/** Prints encrypted string. a->b, b->c,c->d...,z->a
but leave other characters unchanged
void encrypt() {
int count = 0;
int i=0
String mesg = "Hello World!";

 while( i < ____________________ )

   char c= mesg.charAt( ________ )

   count ++;

   if  c> "a" || c < "z"    {
         int letter = c - 'a';
         int encrypted = ( _____________ ) % 26;

         c = ( ___________ )( _____________ )

   } else count --;

TextIO.put(c);
TextIO.putln(count  + " chars modified")
```

Why is the last 'else' important? What would happen if it was omitted?

7. If-Else analysis

```
int x=  ... ;
int y = 100;
if( x%2 == 0) if( x >50 ) y=101; else y=102;
TextIO.putln("y="+y);
```

What value of y is printed when x=52?

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8. Exam Question: Complete the following program.

```
public class PostMaster {
  /**
   * Print "RAIL" , "UPS", "DHL" or "FEDEX"
   *
   * Domestic Non-urgent packages under 10 lbs are shipped UPS
   * Domestic Urgent packages 150 lbs or greater are shipped by RAIL
   * International packages are always shipped using FEDEX
   * All other packages are shipped using DHL
   */
  public static void main(String[] args) {
       TextIO.putln("Package Weight?");
       int weight = TextIO.getlnInt();

       TextIO.putln("Urgent?");
       boolean urgent = TextIO.getlnBoolean();

       TextIO.putln("International?");
       boolean international =
                TextIO.getlnBoolean();
```