Name ___________

1. Basis path set testing  
   a. Please draw the control flow graph of the code snippet below.

   ```
   //inputs are x and y
   A while (x<10){
   B   if (y>0){
   C     x+=y;
   } else{
   D     x-=y;
   }
   E printf("x=%d y=%d\n",x,y);
   ```

   b. Please specify a set of linearly independent paths of the code snippet above. Your set has to be a maximum set --- no path is linearly independent with your set of paths.
   (Please use a sequence of A/B/C/D/E to represent a path)

   AE, ABCAE, ABDAE

   c. Please provide a set of inputs that cover the paths you listed above

   \{x=100, y=0\}, \{x=9, y=100\}, \{x=9, y= -100\}
2. Please draw the class diagram for the software described below.

The user-interface of this software contains a text-box and a few other windows. Users are expected to fill the text-box with an address string (e.g., “1100 E 58th St., Chicago”). Once the text-box content is changed, the content in other windows will also change. Specifically, one window will show the map of that address; another window will show the shortest driving distance between the current location and the address in that text box; a third window will show a list of restaurant nearby the specified address. Since more window-style gadgets may be added to the user-interface, you want to make your design easy to extend.

Please include important attributes and method functions in your class diagram.

Which of the following design patterns is most suitable here? ___a___

a. observer
b. composite
c. interpreter