```
printf \n\n\n           #print three blank lines



cat p2.sh              #display the shell script file for the program
#!/bin/bash

set -v                 #turn on echo
printf \n\n\n           #print three blank lines
cat p2.sh              #display the shell script file for the program
printf \f              #issue a form feed (top of a new page)
cat -b p2.java         #display the source file with line numbers
:                      #null command
:
:
:
javac p2.java          #compile the java file
java p2                #execute the file from the current directory
:
:
:
:
date                   #print the date
printf \f              #issue a form feed (top of a new page)

cat -b p2.java         #display the source file with line numbers
     1    /*
     2    PROGRAM NAME: p2
     3    PROGRAMMER: Samuel Jentsch
     4    CLASS: CSC 241.001
     5    INSTRUCTOR: Dr. D. Dunn
     6    DATE STARTED: 9/13/2013
     7    DATE DUE: 9/18/2013

     8    REFERENCES:
     9            Data Abstraction and Problem Solving with Java
    10                 Janet J. Prichard & Frank M. Carrano
    11            Lab 2 Assignment Sheet
    12                 Dr. Debra Dunn

    13    PROGRAM PURPOSE:
    14     a. Receives input from a file in the form of commands. Interprets the commands and uses them
    15                 to manipulate and test instances of the Clock class.
    16     b. Uses three Clock instances and tests them with the commands read from the file.

    17    VARIABLE DICTIONARY:
    18     +c1 - Clock, holds the value of the first clock for use in the program.
    19     +c2 - int, holds the value of minutes for use in the clock.
    20     +c3 - int, holds the valie of seconds for use in the clock.

    21    Files Used:
    22     p2.dat

    23    Test Cases:
    24     Input of G 1 should call the display method of the first Clock object c1.
    25             This should result in an output from the displayTime24hr() Clock method.
    26     Input of I 1 should call the incrementSeconds() method of the first clock object c1.
```

```
27     Input of D 1 calls the displayTime12hr() method on all three Clock objects.
28     */

29     import java.io.*;
30     import java.util.*;

31     public class p2 {

32              public static Clock c1;
33              public static Clock c2;
34              public static Clock c3;
35
36              public static void main(String[] args) {
37                      //Initializes the three clock objects, reads in data from the file, parses the first
letter
38                      //of the command, calls a method to handle the command and passes the correct
parameters.
39                      c1 = new Clock();
40                      c2 = new Clock();
41                      c3 = new Clock(11, 30, 0);
42
43                      try {
44                              Scanner fileReader = new Scanner(new File("../instr/p2.dat"));
45
46                              while(fileReader.hasNextLine()) {
47                                      String s = fileReader.nextLine();
48                                      System.out.println(">>" + s);
49                                      String[] commands = s.split(" ");
50
51                                      if(commands.length > 0) {
52                                              char command =
Character.toUpperCase(commands[0].toCharArray()[0]);
53                                                      switch(command) {
54                                                      case 'G':
55                                                              handleG(commands[1]);
56                                                              break;
57                                                      case 'S':
58                                                              handleS(commands[1], commands[2]);
59                                                              break;
60                                                      case 'I':
61                                                              handleI(commands[1]);
62                                                              break;
63                                                      case 'M':
64                                                              handleM(commands[1], commands[2]);
65                                                              break;
66                                                      case 'T':
67                                                              handleT(commands[1], commands[2]);
68                                                      case 'D':
69                                                              handleD(commands[1]);
70                                                              break;
71                                                      case 'Q':
72                                                              System.out.println("Have a nice day!");
73                                                              System.exit(0);
74                                                              break;
75                                                      default:
```

```java
76                                              System.out.println("Invalid command found.");
77                                          }
78                                      }
79                                  }
80                      } catch (FileNotFoundException e) {
81                              System.out.println("Error: File not found.");
82                      } catch(Exception ex) {
83                              System.out.println("Something went very wrong.");
84                      }


87          }//end main

89          public static Clock findClock(String clock) {
90                      //Returns one of the three class clock variables based on
91                      //the parsed integer value parsed from the clock String.
92                      int clockNumber = Integer.parseInt(clock);
93                      if(clockNumber == 1)
94                              return c1;
95                      else if(clockNumber == 2)
96                              return c2;
97                      else if(clockNumber == 3)
98                              return c3;
99                      else
100                             return null;
101         }

103         public static void handleG(String input) {
104                     Clock c = findClock(input);
105                     if(c != null)
106                             c.displayTime24hr();
107                     System.out.println();
108         }

110         public static void handleS(String clockString, String time) {
111                     String[] timeString = time.split(":");
112                     Clock c = findClock(clockString);

114                     System.out.print("Time " + clockString + " was ");
115                     c.displayTime24hr();

117                     for(int i = 0; i < timeString.length; i++)
118                             if(timeString[i].charAt(0) == '0')
119                                     timeString[i] = timeString[i].substring(1);

121                     c.setTime(Integer.parseInt(timeString[0]), Integer.parseInt(timeString[1]),
Integer.parseInt(timeString[2]));
122                     System.out.print(" and is now ");
123                     c.displayTime24hr();
124                     System.out.println();
125         }

127         public static void handleI(String input) {
128                     Clock c = findClock(input);
129                     c.incrementSeconds();
```

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130                    System.out.print("Time " + input + " is now ");
131                    c.displayTime24hr();
132                    System.out.println();
133            }
134
135        public static void handleM(String input, String minutes) {
136                    Clock c = findClock(input);
137                    c.addMinutes(Integer.parseInt(minutes));
138                    System.out.print("Time " + input + " is now ");
139                    c.displayTime24hr();
140                    System.out.println();
141            }
142
143        public static void handleT(String clockString, String time) {
144                    String[] timeString = time.split(":");
145                    Clock c = findClock(clockString);
146
147                    for(int i = 0; i < timeString.length; i++)
148                            if(timeString[i].charAt(0) == '0')
149                                    timeString[i] = timeString[i].substring(1);
150
151                    Clock compareC = new Clock(Integer.parseInt(timeString[0]),
Integer.parseInt(timeString[1]), Integer.parseInt(timeString[2]));

152                    System.out.print("There is " + Clock.findDifference(c, compareC) + " seconds
between ");
153                    c.displayTime24hr();
154                    System.out.print(" and ");
155                    compareC.displayTime24hr();
156                    System.out.println();
157            }
158
159        public static void handleD(String option) {
160                    int displayType = Integer.parseInt(option);
161                    if(displayType == 1) {
162                            System.out.print("time 1 is ");
163                            c1.displayTime12hr();
164                            System.out.print(" time 2 is ");
165                            c2.displayTime12hr();
166                            System.out.print(" time 3 is ");
167                            c3.displayTime12hr();
168                    } else if(displayType == 2) {
169                            System.out.print("time 1 is ");
170                            c1.displayTime24hr();
171                            System.out.print(" time 2 is ");
172                            c2.displayTime24hr();
173                            System.out.print(" time 3 is ");
174                            c3.displayTime24hr();
175                    }
176                    System.out.println();
177            }
178
179    }//end class


:                       #null command
```

```
:
:
javac p2.java          #compile the java file
java p2                #execute the file from the current directory
>>G 1
00:00:00
>>S 2 11:03:20
Time 2 was 00:00:00 and is now 11:03:20
>>I 3
Time 3 is now 11:30:01
>>M 3 90
Time 3 is now 13:00:01
>>T 3 08:00:00
There is 18001 seconds between 13:00:01 and 08:00:00

>>T 1 00:00:01
There is 1 seconds between 00:00:00 and 00:00:01
time 1 is 00:00:00 AM time 2 is 11:03:20 AM time 3 is 1:00:01 PM
>>D 1
time 1 is 00:00:00 AM time 2 is 11:03:20 AM time 3 is 1:00:01 PM
>>D 2
time 1 is 00:00:00 time 2 is 11:03:20 time 3 is 13:00:01
>>S 1 11:59:57
Time 1 was 00:00:00 and is now 11:59:57
>>I 1
Time 1 is now 11:59:58
>>I 1
Time 1 is now 11:59:59
>>I 1
Time 1 is now 12:00:00
>>I 1
Time 1 is now 12:00:01
>>D 1
time 1 is 12:00:01 AM time 2 is 11:03:20 AM time 3 is 1:00:01 PM
>>I 3
Time 3 is now 13:00:02
>>G 3
13:00:02
>>S 2 23:45:00
Time 2 was 11:03:20 and is now 23:45:00
>>I 2
Time 2 is now 23:45:01
>>M 2 20
Time 2 is now 24:05:01
>>D 1
time 1 is 12:00:01 AM time 2 is 12:05:01 PM time 3 is 1:00:02 PM
>>D 2
time 1 is 12:00:01 time 2 is 24:05:01 time 3 is 13:00:02
>>Q
Have a nice day!
:
:
:
date                   #print the date
```