|  |  |
| --- | --- |
| **Unit:** Language Basics | **Turn In List:** **1. This document** |
| *“I will understand and implement date/time features of my language.”* | |

**Content Objectives:** Students will properly use their language date/time features to make comparisons and calculations.

|  |
| --- |
| **Starter Activity** |
| How do you print the current full date and time in your language?  import java.util.Date;  Date date = new Date();  System.out.println(date.toString()); |

|  |
| --- |
| **Assignment:** |
| Students will use the following websites and internet searches to complete the table below:  Java: <http://www.tutorialspoint.com/java/java_date_time.htm> Note the use of millis!  C++: <http://www.tutorialspoint.com/cplusplus/cpp_date_time.htm>  Python: <http://www.tutorialspoint.com/python/python_date_time.htm>  C#: <https://msdn.microsoft.com/en-us/library/system.datetime.now(v=vs.110).aspx>  C++ and Python: note the use of a struct to handle individual elements of the date/time! |

|  |  |
| --- | --- |
| **Include Sample Code or Explanation for the following concepts below (copy and paste lines from editor)** | |
| Code to print current time only: | import java.text.\*;  SimpleDateFormat time = new SimpleDateFormat("HH.mm.ss z");  System.out.println("Current time: " + time.format(date)); |
| Code to print current date as: Day Month Year | import java.text.\*;  SimpleDateFormat DMY = new SimpleDateFormat("dd/MM/yyyy");  System.out.println("Current date (DD/MM/YYYY): " + DMY.format(date)); |
| Code to format date as: YYYY/MM/DD | import java.text.\*;  SimpleDateFormat YMD = new SimpleDateFormat("yyyy/MM/dd");  System.out.println("Current date (YYYY/MM/DD): " + YMD.format(date)); |
| Code to print current date with UTC offset for MST (mountain time or -7) |  |
| Code to convert (cast)current date/time to string | System.out.println(date.toString()); |

Pseudocode an app that asks for the user’s birthdate and calculates the age in millenniums, centuries, decades, years, months, days, hours, minutes, seconds.

|  |
| --- |
| 1. Use the scanner class to ask the user for their birth month, birth day, and birth year, and store each value in a variable. 2. Create two objects of the calendar class. 3. Set one calendar equal to the user’s birthday and one calendar to the current time. 4. Get each date in milliseconds and find the difference between the two. 5. Convert milliseconds to each period of time such as days, weeks, etc. using math. Most calculations are done by converting days to a period of time. 6. Print out the variables and concatenate it with some text. |

Code the app that calculates the above pseudocode (note: depending on your language, you may need to ask for day, month and year separately and set each value to a global variable…) Consider adding functionality to ask for two dates and calculate the difference between them.

|  |
| --- |
| // Jonathan Su, Feb. 2021  import java.util.Scanner;  import java.util.Calendar;  import java.util.Date;  import java.text. \* ;  class Main {  public static void main(String[] args) {  Scanner input = new Scanner(System. in );  Calendar calendar1 = Calendar.getInstance();  Calendar calendar2 = Calendar.getInstance();  Date date = new Date();  SimpleDateFormat MDY = new SimpleDateFormat("MM/dd/yyyy");  System.out.println("Enter the month you were born (1-12):");  int month = input.nextInt();  System.out.println("\nEnter the day you were born (1-31):");  int day = input.nextInt();  System.out.println("\nEnter the year you were born as 4 digits:");  int year = input.nextInt();  System.out.println("\n" + month + "/" + day + "/" + year);  calendar1.set(year, month - 1, day);  long milliC1 = calendar1.getTimeInMillis();  long milliC2 = calendar2.getTimeInMillis();  long diff = milliC2 - milliC1;  System.out.println(milliC2 + " - " + milliC1);  System.out.println(diff + " ms");  double days = diff / 86400000;  double millenium = (((days / 365) / 100) / 10);  double centuries = ((days / 365) / 100);  double decades = ((days / 365) / 10);  double years = days / 365;  double months = years \* 12;  double weeks = days / 7;  long hours = diff / 3600000;  long minutes = diff / 60000;  long seconds = diff / 1000;  System.out.println("\nYour age is:");  System.out.println(millenium + " millenium");  System.out.println(centuries + " century");  System.out.println(decades + " decades");  System.out.println(years + " years");  System.out.println(months + " months");  System.out.println(weeks + " weeks");  System.out.println(days + " days");  System.out.println(hours + " hours");  System.out.println(minutes + " minutes");  System.out.println(seconds + " seconds");  System.out.println(diff + " milliseconds");  System.out.println("\n\*These values are from " + month + "/" + day + "/" + year + " at midnight to " + MDY.format(date) + " at midnight, and are approximate.");  }  } |