Labs

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Even Odd	Paper Rock Scissors Lizard Spock	Multiple Choice Test
Mixed Number Version 2	Leap Year	
Grade Average	Income Tax	
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Extra Credit

Parking Lot

Even Odd

Directions

Write a program that gets an integer from the user and then tells them if the number they entered is even or odd number. The result must include the entered number and its category, even / odd.

Rubric (counts as 1 other grade)

Points	Task
20	Gets an int value
20	Displays the entered number as part of the output
20	Says even for even numbers
20	Says odd for odd numbers
20	Formatting and neatness of results

Mixed Number Version 2

Directions

Write a program that gets a fraction from the user. The fraction will be entered as a numerator and denominator. The program will then display the number as a whole number if denominator can perfectly divide the numerator or a mixed number if it cannot.

Rubric (counts as 1 other grade)

Points	Task
10	Gets the numerator and denominator from the user
40	Correct for whole number results
40	Correct for mixed number results
10	Formatting and neatness of results

Grade Average

Directions

Write a program that will allow the user to enter four grades. The program will calculate and display the student's average and letter grade. The program will store its data as doubles and round the average to two decimal places.

A – 90 or more

B – 80 or more, but less than 90

C – 75 or more, but less than 80

D – 70 or more, but less than 75

F – Less than 70

Rubric (counts as 1 other grade)

Points	Task
20	Gets grades
30	Correct average
30	Correct grade letter
20	Formatting and neatness of results

Class Percentile

Directions

Write a program that asks the user how many people are in his/her class and what rank they are. The program will then tell the user what percentile they are in and if they are the salutatorian or valedictorian.

Sample Output:

Enter the number of students that are in your class: 500
Enter your rank: 12

You are in the top 2.40% of your class.

Rubric (counts as 1 other grade)

Points	Task
20	Gets data
30	Correct Percentile
30	Correct for the valedictorian and salutatorian
20	Formatting and neatness

Paper Rock Scissors Lizard Spock

Directions

Write a game that allows the user to play a single game of paper rock scissors lizard spock with the computer. The user will enter 1 for paper, 2 for scissors, or 3 for rock, 4 for lizard and 5 for spock. The computer will randomly pick 1, 2, 3, 4 or 5. You will compare the choices of the computer and the player, and then print the results of the game.

Rubric (counts as 1 minor grade)

Points	Task
15	Gets the users choice
25	Displays what the player picked
25	Displays what the computer picked
25	Displays the results of the game
10	Formatting and neatness of results

Leap Year

Directions

Write a program that will ask the user for a year and tell them if the year they entered “is a leap year” or “is not a leap year”.

Leap year rules:

If a year is not divisible by 4 it is not a leap year.

If a year is divisible by 4 it is a leap

Unless it is also divisible by 100 in which case it is not a leap year

Unless it is also divisible by 400 in which case it is a leap year!

Years to test:

input	Leap Year Status
1900	Is not a leap year
1983	Is not a leap year
1984	Is a leap year
2000	Is a leap year
2100	Is not a leap year
2200	Is not a leap year

Rubric (counts as 1 minor grade)

Points	Task
10	Gets the year
20	Correct for years that are not divisible by 4
20	Correct for years that are not divisible by 4 and not 100 or 400
20	Correct for years that are not divisible by 4 and 100, but 400
20	Correct for years that are not divisible by 4,100 and 400
10	Formatting and neatness of results.

Income Tax

Directions

Write a program that gathers tax data from the user and then tells the user how much they will owe in taxes. Every user will enter a character value for their filing status ‘S’ for single, ‘M’ for married and ‘J’ for filing jointly. The user will also have to enter their combined income, and the number of tax deductions they are claiming.

The program will start by calculating how much of the income is taxable. The taxable income is found by subtracting $1000 for each deduction and $5000 more for the standard deduction from the user’s income. When the taxable income is less than zero set it to zero.

After the taxable income has been found use the chart is used to determine the tax percentage that the user will have to pay on their taxable income.

Status / Taxable Income	0 to 30,000	30,000+ to 50,000	50,000+
S	.05	.10	.20
M	.08	.16	.24
J	.10	.20	.30

The program will have to tell the user how much they made before taxes, the amount of taxable income, what tax percentage they are paying, how much they will owe on their taxes and the amount of take home they will have after paying taxes.

The amount owed is the taxable income times the tax percentage. The take home is the income amount minus the amount paid in taxes.

Note: All the tax data for this program was made up.

Rubric (counts as 1 minor grade)

Points	Task
20	Gathers data correctly
15	Correct taxable income amount
15	Correct tax percentage
15	Correct tax amount
15	Correct take home
20	Formatting and neatness of results

Temperature Converter

Directions

Write a program asks the user what type of temperature conversion he/she wants done, Celsius to Fahrenheit or Fahrenheit to Celsius. The program will then let the user enter a temperature to be converted and tell the user what the temperature would be in the other system.

Sample Output:

---Temperature Conversion Menu---

1. Celsius to Fahrenheit
2. Fahrenheit to Celsius

Enter selection: 1

Enter the temperature you want to convert: 100

100 degrees in Celsius is 212 degrees in Fahrenheit.

Rubric (counts as 1 minor grades)

Points	Task
20	Menu
30	Correct Celsius to Fahrenheit
30	Correct Fahrenheit to Celsius
20	Formatting and neatness of results

Multiple Choice Test

Directions

Write a program asks the user 10 multiple choice questions and then tells them how many they got right, their score and grade letter. The test will have 10 questions and each question will have 5 answer choices each (A-E).

Sample Output:

1.) What is the import for Scanner?

A. import java.util.Scanner;
B. import util.Scanner;
C. import Scanner;
D. import java.Scanner
E. None of the Above.

Enter your selection: A

…

10.) Select the largest animal:

A. cat
B. elephant
C. dog
D. alligator
E. They are all of equal size

Enter your selection: E

You got 3 out of 10 right.
You made a 30 on the test, giving you an F.

Rubric (counts as 2 minor grades)

Points	Task
20	Questions
30	Correct Score
30	Correct grade letter
20	Formatting and neatness of results

Parking Lot

Directions

Write a program that allows the user to enter two times, in military format. The first time is when the car was parked and the second time is when the car is picked up.

Once the times have been entered the program will give the user the following three pieces of information: the amount of time the car was parked in the garage, the time the user will be charged for, and the fee the user will pay.

The amount of time the car was parked in the garage is amount of time from parking to pick up, unless the car was towed. At midnight cars that have not been picked up are towed to an overflow lot.

For towed cars the parked time will be the parked time to midnight. This time will be used for calculating the fee. In addition to normal charges, towed cars have an additional fee of $150.00. **The program must tell the user when they are towed and tell them about the extra charge. Cars get towed when the pickup time is before the parked time.**

Parking fees / Charged Time:

- The first two hours are one and one half dollars each
- Minimum hours charged is two
- Each additional half hour costs fifty cents
- Maximum hours charged is eight
- An additional charge of one hundred and fifty dollars is applied when towed.
- When the parked minutes are greater than 0 and less than or equal to 30 the charged minutes will be 30
- When the parked minutes are greater than 30 the charged time will be rounded up to the next hour

Times to test:

Time in	Time out
1	2
2	1
100	205
200	225
415	832
402	846
2113	555
845	713
2314	111
1935	222
2312	436
1758	333
100	330

This lab can replace a test with a 100 or add 10 points to your semester final.