Polytechnic Tutoring Center

Exam 1 Review - CS 1113, Spring 2022

Disclaimer: This mock exam is only for practice. It was made by tutors in the Polytechnic Tutoring Center and is not representative of the actual exam given by the CS Department.

1 Given these assignments: **a = 5, b = 2,** and **s = 1.5** write the result type and value of the following expressions. Circle **ERROR** if the expression will result in a run time error.

Statement:	Type:	Value:	ERROR:
a / b	_____	_____	ERROR
b ** a	_____	_____	ERROR
float(a) / b	_____	_____	ERROR
a % b	_____	_____	ERROR
s // a	_____	_____	ERROR
a > b	_____	_____	ERROR
a == b	_____	_____	ERROR
a // b	_____	_____	ERROR
a + b * a	_____	_____	ERROR
b =< s	_____	_____	ERROR

2 Conversion between binary, decimal and hexadecimal numbers:

a. Convert the binary number **11101011** to decimal: _____

b. Convert the decimal number **151** to binary: _____

c. Convert the binary number **10011100** to hexadecimal: _____

d. Convert the hexadecimal number **5F** to binary: _____ (please show all 8 binary digits)

e. Convert the decimal number **90** to hexadecimal: _____

3 What is the output from the following code if the user enters 75?

```
c=int(input('Enter a value: '))
if c > 100:
      print("A")
elif c > 50:
      if c % 5 == 0 and not(c % 10 == 0):
            print("B")
      if c % 5 == 0:
            print("C")
      else:
            print("D")
if c > 20:
      print("E")
else:
      print("F")
```

<u>**Your answer:**</u>

4 What is the value of acc at the end of the following code?

```
acc = 0
if 3*acc:
      acc += 1
else:
      if acc:
            acc += 5
      elif acc + 2:
            acc += 10
      else:
            acc += 20
      acc += 10
```

<u>**Your answer:**</u>

5 Write a program to calculate the federal tax for single filers. The program will take user's income as input and print out the amount of federal tax that user needs to pay. The program will user 2021-2022 tax brackets as follow:

Tax Rate	Income bracket	Amount
10%	$0 to $9,950	10% of taxable income
12%	$9,951 to $40,525	$995 plus 12% of the amount over $9,950
22%	$40,526 to $86,375	$4,664 plus 22% of the amount over $40,525
24%	$86,376 to $164,925	$14,751 plus 24% of the amount over $86,375
32%	$164,926 to $209,425	$33,603 plus 32% of the amount over $164,925
35%	$209,426 to $523,600	$47,843 plus 35% of the amount over $209,425
37%	$523,601 or more	$157,804.25 plus 37% of the amount over $523,600

Tax brackets show you the tax rate you will pay on each portion of your income. For example, if you are single, the lowest tax rate of 10% is applied to the first $9,950 of your income in 2021. The next chunk of your income is then taxed at 12%, and so on, up to the top of your taxable income.

For simplicity, assume users will input integers as income. However, the amount of tax to output has to have two decimal points.

Example:
_____
Enter your income: $600000
Amount of tax owed is: $186072.25

_____
Enter your income: $9950
Amount of tax owed is: $995.00

Code:

6 Write a program that will output the user's astrological sign, or zodiac sig, or horoscope sign, from their birth date. The program will ask the user for the day of birth, then ask for the month of birth (in words, e.g january, february,…). You can refer to the table below *(mine is cancer btw)*. Finally, print out the user's current luck point out of a 100 (which we will generate using the random module and also can be 0). The luck point should be an integer.

Assume all inputs are correct.

- **Aries** (March 21 – April 19)
- **Taurus** (April 20 – May 20)
- **Gemini** (May 21 – June 20)
- **Cancer** (June 21 – July 22)
- **Leo** (July 23 – August 22)
- **Virgo** (August 23 – September 22)
- **Libra** (September 23 – October 22)
- **Scorpio** (October 23 – November 21)
- **Sagittarius** (November 22 – December 21)
- **Capricorn** (December 22 – January 19)
- **Aquarius** (January 20 – February 18)
- **Pisces** (February 19 – March 20)

Example:

```
Input the day of birth (e.g. 1,2,3 etc): 18
Input month of birth (e.g. march, july etc): january
Your Astrological sign is : capricorn
Your current luck point is : 73
```

Code: