ANSWER KEY

Polytechnic Tutoring Center

Exam 1 Review - CS 1113, Fall 2021

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 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`	**float**	**2.5**	ERROR
`b ** a`	**int**	**32**	ERROR
`float(a) / b`	**float**	**2.5**	ERROR
`a % b`	**int**	**1**	ERROR
`s // a`	**float**	**0.0**	ERROR
`a > b`	**bool**	**True**	ERROR
`a == b`	**bool**	**False**	ERROR
`a // b`	**int**	**2**	ERROR
`a + b * a`	**int**	**15**	ERROR

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2 Conversion between binary, decimal and hexadecimal numbers:

a. Convert the binary number 11101011 to decimal: _____**235**_____

b. Convert the decimal number 151 to binary: ___**10010111**___

c. Convert the binary number 10011100 to hexadecimal: _____**9C**_____

d. Convert the hexadecimal number 5F to binary: _____**1011111**_____ (please show all 8 binary digits)

e. Convert the decimal number 90 to hexadecimal: _____**5A**_____

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")
```

Commented [1]: Syntax error, this needs to be indented.

When building a test, I always copy my code like this to Python and attempt to run it so that I know what the answer will be, and that there are no syntax errors.

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Your answer:

B

C

E

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
```

Your answer:

acc = 20

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5 Write a program that calculates the area and perimeter of a rectangle when given the length and width of the rectangle as input. You should check to make sure that the length and width you are given is strictly positive. You may however assume that the user inputs an integer for the length and width values.

Sample Outputs 1:

```
Enter a length: 3
Enter a width: 4.5
Area: 13.5
Perimeter: 15
```

Sample Outputs 2:

```
Enter a length: 7
Enter a width: -8
ERROR: Width and length must be positive
```

Code:

```
l = int(input("Enter a length: "))
w = int(input("Enter a width: "))
if (l > 0 and w > 0):
   a = l*w
   p = 2*l + 2*w
   print("Area: ", a)
   print("Perimeter: ", p)
else:
   print("ERROR: Width and length must be positive")
```

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6 Write a program that will calculate the number of days the user has been alive given the user's birthday. The user will input the day and month he was born along with the year as prompted by the program. Assume the user does in fact input a positive integer for all inputs. To make things easier, you can assume that the user was born before the year 2020. Also, note that we do care about leap years and exactly how many days are in a month, so here are a couple rules just in case you're like me and forgot how many days are in the month of September:

1. Know that 2020 and any other year that is divisible by 4 is a leap year.
2. There are 31 days in January, 28 days in February (29 if it is a leap year), 31 in March, 30 in April, 31 in May, 30 in June, 31 in July, 31 in August, 30 in September, 31 in October, 30 in November and 31 in December.

Have fun ☺

Code:

```
birth_day = int(input("Enter the day of the month you were born: "))

birth_month = int(input("Enter the number of the month in which you were
born: "))

birth_year = int(input("Enter the year in which you were born: "))

num_years = 2019 – birth_year

num_days = num_years//4*(366 + 3*365)

num_days += num_years%4*365

if birth_month < 10:

    num_days += 366

    if birth_month == 9:
```

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```
            num_days += 6 + (30 – birth_day + 1)
      elif birth_month == 8:
            num_days += 36 + (31 – birth_day + 1)
      elif birth_month == 7:
            num_days += 67 + (31 – birth_day + 1)
      elif birth_month == 6:
            num_days += 98 + (30 – birth_day + 1)
      elif birth_month == 5:
            num_days += 128 + (31 – birth_day + 1)
      elif birth_month == 4:
            num_days += 159 + (30 – birth_day + 1)
      elif birth_month == 3:
            num_days += 189 + (31 – birth_day + 1)
      elif birth_month == 2:
            num_days += 220 + (28 – birth_day + 1)
      elif birth_month == 1:
            num_days += 248 + (31 – birth_day + 1)
elif birth_month == 10:
```

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```
      if birth_day < 7:
            num_days += 366 + (7 – birth_day)
      else:
            num_days += 366 + (7 – birth_day - 1)
else:
      if birth_month == 11:
            num_days += (30 – birth_day + 1) + 311
      elif birth_month == 12:
            num_days += (31 – birth_day + 1) + 280
statement = “You are “ + str(num_days) + “ old”
print(statement)
```