



Polytechnic Tutoring Center

Exam 1 Review - CS 1114, Spring 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 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

- 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")
    elif 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.

Your answer:

- 4 What is the output from the following code ?

```
acc = 0
for i in range(5,15,5):
    var = i;
    while var>0:
        var//=2;
        acc+=var;
        print("i=",i," var=",var);
print("acc=",acc);
```

Your answer:

- 5 Write a program that prompts for radius length. Your program should calculate and print the resulting circumference (float) and area (float) of a circle with that radius. You must also check that the given radius is **positive**. Otherwise, print an error message and do not carry out the calculations. Use $\pi = 3.14$ for this question rather than importing the math module.

Sample Outputs 1:

```
Enter a radius: 3
Circumference: 18.84
Area: 28.26
```

Sample Outputs 2:

```
Enter a radius: -1
ERROR: Radius must be positive
```

Code:

- 6 Write a program that prompts a row number and print out the pattern in a zig-zag way. If the leading number of the row is odd, the row displays numbers in a decreasing sequence, starting from the leading number to 1. If the leading number of the row is even, the row displays numbers in an increasing sequence, starting from 1 to the leading number. Assume the input is always a valid positive integer.

Sample Output 1:

```
Enter # of row: 5
5 4 3 2 1
1 2 3 4
3 2 1
1 2
1
```

Sample Output 2:

Enter # of row: 4

```
4 3 2 1
3 2 1
1 2
1
```

Code:



- 7 Given a positive integer number, write a program to print the total number of times each digit. Write a program that prompts the user to enter a sequence of positive integers where each integer represents how many hours the employee worked in a day this week. When the user enters a negative integer, there are no more days to input. However, since there is a maximum of 7 days in a week, so at most you can take inputs for 7 times. The program should then print out (a) the employee's bonus pay for

that week; (b) the employee's overtime pay for that week; and (c) the employee's total pay for that week.

The rules governing an employee's pay are as follows:

- a. Each employee has an hourly pay rate, which we will call `payRate`. An employee is paid `payRate` dollars for every hour worked. `payRate` is a variable defined for you in advance; you should not define it or read it in.
- b. If an employee works more than 10 hours in a single day, they must be paid an additional *bonus* of \$13 for each such day.
- c. If an employee works a total of more than 40 hours in a single week, any hours over 40 will be paid at an *overtime* rate of one-and-a-half times their usual hourly wage. Hours under 40 will be paid at the usual rate. For example, if an employee has a normal rate of \$10 per hour and works 45 hours in a single week, they will be paid $\$10 \times 40 = \400 for the first 40 hours, then an additional overtime of $1.5 \times \$10 \times 5 = \75 for the remaining 5 hours, for a total pay of \$475.

The output in your calculations should be rounded to 2 decimal places if the output is more than 2 decimal places.

(In the following examples, `payRate` is 10.275.)

Sample outputs:

Enter the hour worked: 10 -1 Bonus Pay: \$0.0 Overtime Pay: \$0.0 Total Pay: \$102.75	Enter the hour worked: 10 10 11 -2 Bonus Pay:\$ 13.0 Overtime Pay:\$ 0.0 Total Pay:\$ 331.53
Enter the hour worked: 20 20 10 -1	Enter the hour worked: 5 5 5 5

Bonus Pay: \$26.0	5
Overtime Pay: \$154.12	5
Total Pay: \$591.12	5
	Bonus Pay: \$ 0.0
	Overtime Pay: \$ 0.0
	Total Pay: \$ 359.62

Code: