

Week One Test Preparation.

20.13 Grade Calculator

Write a program to calculate a course grade for HW, quizzes, MT, and final exam. Grades are calculated differently for undergrad, grad student, and distance learners.



Input Data:

UG

← type of student (string)
UG / G / DL

600.0

300.0

120.0

185.0

HW

Quiz

MT

Final

points totals.

Question 1: what are the maximum point totals for each

category?

Ans 1:

800, 400, 150, 200

Question 2: What are the weights for each category?

Answer 2:

	UG	G	DL
HW	20%	15%	5%
Q	20%	5%	5%
MT	30%	35%	40%
Final	30%	45%	50%

(Aside: Why are these weights what they are?)

Variables / data structures needed:

array

→ string

Student - grades

Student - grades

ug - weights

g - weights

dl - weights

total - points

→ list, float

→ ~~list~~, float tuple

→ ~~list~~, float tuple

→ ~~list~~, float tuple

→ tuple, float

Step 1: # Get the student type from user. → check for error

Step 2: # Get the student grades from user. → store in student-grades

Step 3: # Define total_points, ug-weights, g-weights, dl-weights.

Step 4: # Calculate percentages in each category.

Step 5: # Calculate overall grade.

Step 6: # Calculate the letter grade.

Step 7: # Create Output Report.

See grade-calculator.py for code!

22.13

Tax Calculation

Write a program to calculate U.S. income tax owed, given:

- income {
- ① wages ✓
 - ② taxable interest ✓
 - ③ unemployment compensation ✓
 - ④ status (dependent/single/married)
 - ⑤ taxes withheld.
- 0, 1, 2 ✓

What else would we need to know?

A) Basic Deduction Amount, based on status.

0 - dependent → 6000
1 - single → 12000

1 - \rightarrow 24000

2 - married

(if status is anything else \rightarrow 6000)

B) Tax Tables

Single / Dependent:

0 - 10000	10%
10000 - 40000	1000 + 12% over
40000 - 85000	4600 + 22% over
over 85000	14500 + 24% over

Married:

0 - 20000	10%
20000 - 80000	2000 + 12% over
over 80000	9200 + 22% over

Step 1: Get input

Ex.

20000

↑
wages

23

↑
interest
income

500

↑
unemp.

1

↑
status

400

↑
tax
withheld

Step 2: Calculate Adjusted Gross Inc.

$$= \text{wages} + \text{interest income} + \text{unemployment compensation}$$

Calc - AGI ()

Step 3: Calculate Deduction
→ based on status

get - deduction ()

Step 4: Calculate Taxable Income
→ set to 0 if negative
→ AGI - deduction.

Calc - taxable ()

Step 5: Calculate the tax

calc tax ()

Step 6:

Calculate tax due

→ tax owed - tax withheld

Calc-tax-due()

Step 7:

Output report

12345

12,345