

In place of a signature, please include a commented statement in your code affirming your recognition of the Academic Honesty Policy for the Exam 1. You will replace the blank with your name and UHID as an acknowledgement in your starting file as acknowledgement of this policy.

```
% I,<INSERT FULL NAME> (<INSERT UHID>) acknowledge that the Exam 1 for ENGI 1331,
% is to be completed by myself with no collaboration with anyone.
% I have read the ENGI 1331 Position on Academic Honesty and agree
% to abide by its provisions while taking this exam.
% I acknowledge that my submission will be run through a similarity code.
% Any student with unacceptable levels of commonality with peers or
% other sources will be brought up for an academic honesty violation.')
```

INSTRUCTIONS:

This virtual computer exam will be given on Wednesday, June 23, 2021.

- (1) You must be logged in with video on to your virtual classroom during the entire exam. If you lose connection during the exam, re-enter the virtual classroom and proceed with the exam.
- (2) Computer with internet access and video is required.

General Rules

- You should **suppress** all output to the Command Window except if specific formatted output is requested.
- You must use any variable names specified. **If a variable name is not specified, you may create your own name for the variable.**
- **Do Not Hard Code for a specific case – your code must be flexible based on the instructions provided.**

Exam Timeline and Submission:

You will **have 1 hour to complete all tasks after the 15-minute downloading/planning period and 5 minutes to upload your code.** After time is called, you will be expected to close out of MATLAB and zip your exam folder.

- (3) During the exam, **NO COLLABORATION** of any kind (messaging of concepts, code or sharing of files) is permitted. If you are found to have collaborated during the exam, you will be brought up on academic honesty violations with the appropriate penalty enforced.

After the exam is completed and the files are submitted, any procedure (such as opening the file) which alters the date / time stamp of the file will void any allowances for mis-saved files – in other words, **after the exam is over DO NOT OPEN the file again!**

Saving Exam File

You will be expected to have one main script file associated with your exam submission in addition to any starting files, exported files, or function files. Save your script file in the exam folder on your desktop as **Exam1_cougarnet.m**. All other functions that are requested should be named as instructed with the correct function name. You must submit a .ZIP folder named **Exam1_cougarnet.zip** that contains your main script and all supporting files.

MATLAB Programming (70 points) – Approx. 60 minutes + 15 minutes for planning

Table 1 shows the annual salary for a set of people. Each column is a subsequent year based on the starting year entered by the user. For example, for Table 1, 2008 was entered as the initial year and the year increases by one for each column.

Table 1. Annual Salary for Recent Graduates (2008 entered as starting year - highlighted)

		2008	2009	2010	2011	2012	2013
Names	Bethel Pettry	61374	61913	62420	63057	65967	67828
	Erich Kerrick	55045	55939	56699	57519	61277	70327
	Jacques Conder	56063	0	0	60951	63278	63957
	Sylvester Pavia	55057	55710	56243	56778	60501	66763
	Verdell Kurz	0	61975	62840	63644	0	64555
	Charity Herdon	62173	62870	63383	0	58890	66718
	Theron Neira	58962	59644	60365	61158	64923	74387
	Timika Kelling	61808	62322	63281	63837	65516	70844
	Ettie Mally	0	56332	57201	57964	59792	61224
	Rosetta Blocher	59593	60479	61185	61724	0	0
		Salary					

Exam1Summer2021.mat file provided has two variables that contains the information in the table above:

- **Names:** contains the element name (string array)
- **Salary:** contain annual salary different combination of the percent of each element for the alloy numbers (matrix)

Perform the following tasks referring the sample output on the next page.

NOTE: Your code should be flexible to the number of rows and columns in **Salary**. You can assume the number of **Names** will always equal the number of rows in **Salary**.

Tasks:

Task 1 (10 min) – 16 pts

- [1 pt] Load the data **Exam1Summer2021.mat** into your script.
- [6 pts] Ask the user to enter the starting year. Create a vector of years starting with the user input and having a length equal to the number of columns in **Salary**.
- [2 pts] Create a menu to select a name from the **Names** variable.
- [3 pts] Create a menu to select a year.
- [4 pts] For the selected name and year, create a formatted output for the corresponding annual salary as shown in the sample output.

Task 2 (10 min) – 10 pts

- You will be creating a summary matrix that builds around the **Salary** matrix.
 - [4 pts] Determine the total salary reported for each name (row) and place in a new column to the right of the salary (last column).
 - [4 pts] Determine the highest reported salary for each year and column containing total salary and place in a new row at the bottom (last row).
 - [2 pts] Export the summary matrix as a .csv file name **Task2.csv**. See sample output for **Task2.csv** expected result

Task 3 (15 min) – 17 pts

- For the selected name from Task 1, determine the following:
 - [5 pts] the highest annual salary and associated year
 - [5 pts] the number of years with a salary greater than zero
 - [3 pts] the average annual salary for all years greater than zero.
- [4 pts] Create formatted output for the results above as shown in the sample output.

Task 4 (20 min) - 27 pts

- [15 pts] Determine the amount of taxes paid for ALL annual salaries in **Salary** by applying the piecewise function (Eq. 1) below,

$$t(s) = \begin{cases} 0, & s = 0 \\ s^{0.9}, & 55000 \leq s < 65000 \\ \frac{s}{2}, & 65000 \leq s \end{cases} \quad \text{Eq. 1}$$

where s is equal to the annual salary and t is equal to the annual taxes. The result should be a matrix named **Taxes**.

NOTE: **Taxes** and **Salary** should have the same dimensions.

- [8 pts] Determine the overall highest annual taxes paid and the associated name, year, annual salary, and annual taxes.
- [1 pts] Store the four results as a cell array in the order listed name **HighTax**.
- [3 pts] Export the **Taxes** and **HighTax** as a .mat file named **Task4.mat**.

Sample Output:

Sample output for given data:

- Expected exported files are given below. Note the different file types of the exported files.

Sample Output to Command Window (Inputs from Task 1 and Formatted output from Task 1 and 3)

```
Command Window
Enter a starting year: 2008

The annual salary for Jacques Conder in 2012 is $63278.
For Jacques Conder, the highest annual salary was $63957 in 2013.
fx There are 4 non-zero years with average salary of $61062.>>
```

Sample Output for Task 2 (Exported File)

Task2.csv							
	A	B	C	D	E	F	G
	Task2						
	VarName1	VarName2	VarName3	VarName4	VarName5	VarName6	VarName7
	Number	Number	Number	Number	Number	Number	Number
1	61374	61913	62420	63057	65967	67828	382559
2	55045	55939	56699	57519	61277	70327	356806
3	56063	0	0	60951	63278	63957	244249
4	55057	55710	56243	56778	60501	66763	351052
5	0	61975	62840	63644	0	64555	253014
6	62173	62870	63383	0	58890	66718	314034
7	58962	59644	60365	61158	64923	74387	379439
8	61808	62322	63281	63837	65516	70844	387608
9	0	56332	57201	57964	59792	61224	292513
10	59593	60479	61185	61724	0	0	242981
11	62173	62870	63383	63837	65967	74387	387608

Sample Output for Task 4 (Exported File)

HighTax

1x4 cell

	1	2	3	4	5	6	7	8
1	"Theron Neira"	2013	74387	3.7194e+04				
2								

Taxes

10x6 double

	1	2	3	4	5	6
1	2.0379e+04	2.0540e+04	2.0691e+04	2.0881e+04	3.2984e+04	33914
2	1.8478e+04	1.8747e+04	1.8977e+04	1.9223e+04	2.0350e+04	3.5164e+04
3	1.8785e+04	0	0	2.0253e+04	2.0947e+04	2.1149e+04
4	1.8481e+04	1.8678e+04	1.8839e+04	1.9000e+04	2.0118e+04	3.3382e+04
5	0	2.0559e+04	2.0817e+04	2.1056e+04	0	2.1327e+04
6	2.0618e+04	2.0826e+04	2.0979e+04	0	1.9635e+04	33359
7	1.9657e+04	1.9861e+04	2.0077e+04	2.0315e+04	2.1437e+04	3.7194e+04
8	2.0509e+04	2.0662e+04	2.0948e+04	2.1114e+04	32758	35422
9	0	1.8866e+04	1.9128e+04	1.9357e+04	1.9906e+04	2.0334e+04
10	1.9846e+04	2.0111e+04	2.0323e+04	2.0484e+04	0	0
11						