ADANA ALPARSLAN TÜRKEŞ
SCIENCE AND TECHNOLOGY UNIVERSITY

Full Name : _____ Student ID: _____

Grade Table (for Lecturer use only)

Question	Points	Score
1	4	
2	6	
3	15	
4	10	
5	15	
6	25	
7	25	
Total:	100	

Instructions for Midterm Exam

Welcome to the midterm exam of EEE110 - Computer Programming and good luck!

Please read the following rules and confirm by signing that you have read and understood the rules before you receive your exam:

- The midterm exam should be conducted between 09:15 and 12:00. Exam duration is 165 minutes. Students must finalise the exam by delivering it before 12:00. Students are not allowed to leave the exam in the first 30 minutes.

- Student ID cards should visibly be on the edge of desks till the end of the exam. Students without the student ID cards or Turkish identity cards should not be participated into the exam.

- This is a closed-book exam which means that students are not allowed to take notes, books, or any other reference material into the exam. Throughout the exam, students should not possess mobile phones and electronic devices that are capable of storing, receiving or transmitting information or electronic signals, such as computerised watches.

- Students are not allowed to take a glance at the exam questions until told to do so. Students should not communicate with any other student under any circumstances during the exam period. A student, who cheats, tries to cheat during the exam, or is identified to be cheating after investigating exam documents, is given 0 (zero) for that exam and a disciplinary investigation is opened against the student.

- An incorrect answer to a question is awarded no marks with no consideration of any partial credit. Therefore, no partial credit will be given.

In recognition of and in the spirit of the above rules which constitute Adana Alparslan Türkeş Science and Technology University Honour Code, I certify that I will neither give nor receive unpermitted aid on this examination.

Signature: _____

1. Please answer the following questions.

   (a) **(2 points)** Who developed Python programming language?

   Answer:

   (b) **(2 points)** Python is one of the most popular programming languages at the moment. Have you ever wondered why Python is called Python and not P, P++, or P#? Briefly, what was Python named after?

   Answer:

2. **(6 points)** Please answer the following questions by inserting either T for true or F for false at the beginning of the sentence.

   1. RAM is a volatile memory used for temporary storage while a program is running.
   2. In Python, math expressions are always evaluated from left to right, no matter what the operators are.
   3. The if statement causes one or more statements to execute only when a Boolean expression is true.
   4. In a flowchart, both the decision structure and the repetition structure use the diamond symbol to represent the condition that is tested.
   5. A while loop is called a pretest loop because the condition is tested after the loop has had one iteration.
   6. A local variable can be accessed from anywhere in the program.
   7. The math function $\text{ceil}(x)$ returns the smallest integer that is greater than or equal to x.
   8. Strings can be written directly to a file with the write method, but numbers must be converted to strings before they can be written.
   9. The index of the first element in a list is 1, the index of the second element is 2, and so forth.
   10. When accessing each character in a string, such as for copying purposes, you would typically use a while loop.

3. Design a simple calculator by using Python programming language. The program should present a menu to the user for the selection of either one of the following operations:

   - Summation,
   - Subtraction,
   - Multiplication,
   - Integer division,
   - Float division,
   - Exponentiation,
   - Modulus.

   Each operation should request two integer values from the user and print the result to the screen. After the completion of each operation, the program should turn back to the menu of operations and the user should see the menu again. The sentinel value for the menu repetition should be determined as "Q" or "q".

(a) **(5 points)** Draw the flowchart belonging to the simple calculator.

(b) **(10 points)** Write down Python code belonging to the simple calculator.

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4. **(10 points)** Design a Python program that takes height (in m) or time (in s) values from the user and calculates either time or height in the state of free fall.

- Case 1: User types "findTime" as string, program asks user to enter height value in order to find time value.
- Case 2: User similarly types "findHeight" as string, program asks user to enter time value in order to find height value.
- Case 3: Program otherwise displays "Syntax error for input command".

Hint: $h = \frac{1}{2}gt^2$, $t = \sqrt{\frac{2h}{g}}$, and $g = 9.81$ m/s^2.

5. **(15 points)** Adana Demirspor is a football club founded in 1940 by local railway workers in Adana, Turkey and the club has been still competing in Turkish Super League to participate in the European Cup for the football season 2022-2023.

   Assume that result of a football match is evaluated as three points for a win, one point for a draw, and no points for a defeat.

   Design a Python program that calls two user-defined function named as write() and read() under main function as follows:

   - write() function allows user to enter the total number of games first that Adana Demirspor has played so far and then the points that Adana Demirspor gained in each game. The results should be written and saved to a file.

   - Next, read() function should read the contents of the saved file, display the points that Adana Demirspor collected for each game, and finally show the total points that Adana Demirspor had.

A1	A2	A3	A4	A5	A6	A7	A8
B1	B2	B3	B4	B5	B6	B7	B8
C1	C2	C3	C4	C5	C6	C7	C8
D1	D2	D3	D4	D5	D6	D7	D8
E1	E2	E3	E4	E5	E6	E7	E8
F1	F2	F3	F4	F5	F6	F7	F8

Table 1: Mini cinema hall in the 6th question

6. **(25 points)** Develop a Python program that implements the following scenario:

   - Assume a mini cinema hall that has 6 rows from A to F and 8 columns from 1 to 8 as shown in Table 1.

   - Personal information belonging to the audience is firstly inputted to the cinema system software one by one for each customer by a staff at the entrance of the cinema complex. (The first entry is assigned to A1, second entry is assigned to A2, ..., and the last entry is assigned to F8.)

   - Then each customer is invited to the cinema hall starting from A1 to F8 by another staff who also checks customer identities via a control device that shows the ticket price (two decimal places) that has been paid, seat number (a combination of row and column number), customer name, and age (an integer value equal to or greater than 18) on the device screen. (The control device screen can be considered as a printed list of the audience with details from A1 to F8.)

An example of customer control device screen:

–
Seat Number: A1
Customer Name: Kadri Beran Taşkın
Age: 35
Ticket Price: 50.00 TL (Paid)
.
.
.
Seat Number: F8
Customer Name: Onur Akbay
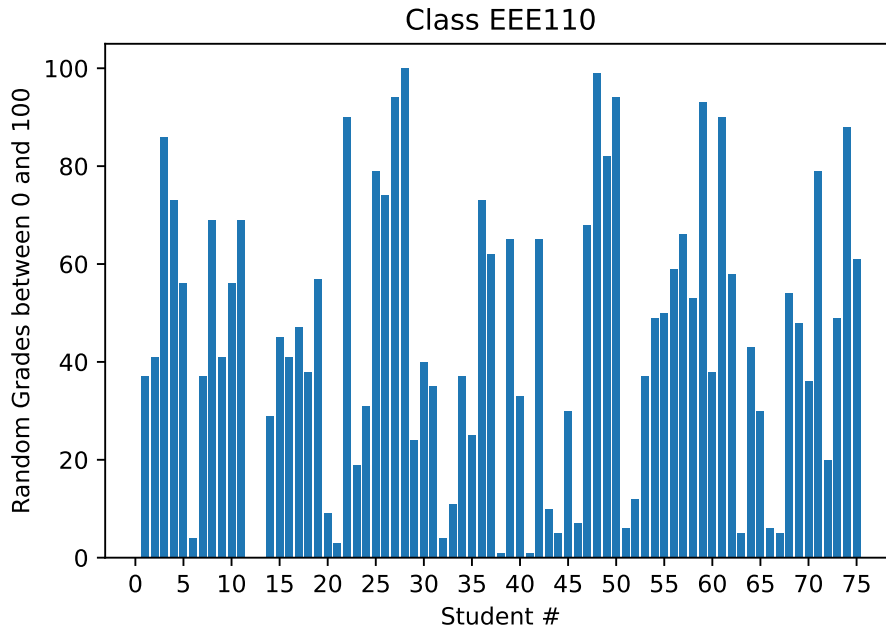Age: 32
Ticket Price: 50.00 TL (Paid)
–

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Figure 1: Bar graph for the 7th question

7. **(25 points)** Write down Python code to plot the exact same bar graph illustrated in Figure 1 by utilising lists and taking the followings into consideration:

   - Students are only allowed to import matplotlib and random modules.
   - The number of students should be inputted from the user at the beginning. (Assume that the number of students was entered as 75 in Figure 1)
   - Random grade belonging to each student should be between 0 and 100 both inclusive.
   - Step size of the ticks on the x-axis should be equal to 5.