



Full Name : _____ Student ID: _____

Grade Table (for Lecturer use only)

Question	Points	Score
1	30	
2	60	
3	30	
Total:	120	

Instructions for Final Exam

Welcome to the final 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 final exam should be conducted between 13:15 and 14:45. Exam duration is 90 minutes. Students must finalise the exam by delivering it before 15:00. 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 AAT Science and Technology University Honour Code, I certify that I will neither give nor receive unpermitted aid on this examination.

Signature: _____



1. **(30 points)** Please answer the following questions by inserting either T for true or F for false at the beginning of the sentence.

- The following code will display “yes + no”:

```
mystr = “yes”  
yourstr = “no”  
mystr += yourstr  
print(mystr)
```

- Empty sets are created by using curly braces { }.
- Object-oriented programming allows us to hide the object’s data attributes from code that is outside the object.
- A class can be thought of as a blueprint that can be used to create an object.
- In a UML diagram the first section holds the list of the class’s methods.
- The self parameter is required in every method of a class.
- Polymorphism works on any two class methods that have the same name.
- One problem with using a UML diagram is that there is no way to indicate inheritance.
- An “is a” relationship exists between a grasshopper and a bumblebee.
- A recursive function must have some way to control the number of times it repeats.

2. **(60 points)** Answer the following questions by selecting only one of the given options.

(a) What type of programming contains class definitions?

- (a) Procedural
- (b) Top-down
- (c) Object-oriented
- (d) Modular

(b) What does the acronym UML stand for?

- (a) Unified Modelling Language
- (b) United Modeling Language
- (c) Unified Model Language
- (d) Union of Modeling Languages

(c) Which section in the UML holds the list of the class’s data attributes?

- (a) First section
- (b) Second section
- (c) Third section
- (d) Fourth section

(d) Which section in the UML holds the list of the class’s methods?

- (a) First section
- (b) Second section
- (c) Third section
- (d) Fourth section



- (e) What type of method provides a safe way for code outside a class to retrieve the values of attributes, without exposing the attributes in a way that could allow them to be changed by code outside the method?
- (a) Accessor
 - (b) Mutator
 - (c) Setter
 - (d) Class
- (f) What is the special name given to the method that returns a string containing an object's state?
- (a) `__state__`
 - (b) `__obj__`
 - (c) `__str__`
 - (d) `__init__`
- (g) Which method is automatically executed when an instance of a class is created in memory?
- (a) `__state__`
 - (b) `__obj__`
 - (c) `__str__`
 - (d) `__init__`
- (h) Which method is automatically called when you pass an object as an argument to the print function?
- (a) `__state__`
 - (b) `__obj__`
 - (c) `__str__`
 - (d) `__init__`
- (i) Combining data and code in a single object is known as
- (a) Modularity
 - (b) Instantiation
 - (c) Encapsulation
 - (d) Objectification
- (j) When an object is passed as an argument, _____ is passed into the parameter variable.
- (a) a copy of the object
 - (b) a reference to the object's state
 - (c) a reference to the object
 - (d) Objects cannot be passed as arguments.
- (k) What gives a program the ability to call the correct method depending on the type of object that is used to call it?
- (a) Polymorphism
 - (b) Inheritance
 - (c) Encapsulation
 - (d) Methods
- (l) What does a subclass inherit from a superclass?
- (a) Instances and attributes
 - (b) Objects and methods
 - (c) Methods and instances
 - (d) Attributes and methods



(m) In the following line of code, what is the name of the subclass?

```
class Rose(Flower):
```

- (a) Rose
- (b) Flower
- (c) Rose(Flower)
- (d) None of these

(n) Given the following line of code, in a UML diagram, what would the open arrowhead point to?

```
class Celery(Vegetable):
```

- (a) Celery
- (b) Vegetable
- (c) class
- (d) Celery(Vegetable)

(o) A function is called from the main function for the first time and then calls itself seven times. What is the depth of recursion?

- (a) 8
- (b) 2
- (c) 1
- (d) 7

(p) What will the following code display?

```
import numpy as np
an_array = np.array([[1,2,3],[4,5,6],[7,8,9]])
a_slice = an_array[1:3,:2]
a_slice[1,1] = 1000
print(an_array[2,1])
```

- (a) 1
- (b) 4
- (c) 8
- (d) 1000

(q) What will the following code display?

```
import numpy as np
an_array = np.array([[1,2,3],[4,5,6],[7,8,9]])
a_slice = np.array(an_array[1:3,:2])
a_slice[1,1] = 1000
print(an_array[2,1])
```

- (a) 1
- (b) 4
- (c) 8
- (d) 1000



	StudentID	Grade
0	2004514018	88
1	2004514008	21
2	2004514004	36
3	2004514001	5
4	2004514022	7
5	2004514035	16

Table 1: grade.csv

- (r) Which of the followings imports the contents of grade.csv file (in Table 1) by creating a DataFrame of Pandas module?
- (a) read.csv()
 - (b) read_csv()
 - (c) import.csv()
 - (d) write.csv()

- (s) If the imported contents of grade.csv file are labelled as df along with introducing Pandas module as pd, what will be the output of the following code?

```
df["StudentID"][df["Grade"] > 20].mean()
```

- (a) 48.333333333333336
 - (b) 28.833333333333332
 - (c) 2004514018
2004514008
2004514004
 - (d) 2004514010.0
- (t) If the imported contents of grade.csv file are labelled as df along with introducing Pandas module as pd, what will be the output of the following code?

```
df["Grade"][df["StudentID"] % 2 == 1].max()
```

- (a) 5
- (b) 16
- (c) 36
- (d) 88

3. (30 points) Write a class named *Student* with data attributes for a student's name, identification number, and telephone number. Next, write a class named *Undergraduate* which is a subclass of the *Student* class. The *Undergraduate* class should have a data attribute for a student's year of study, and a Boolean data attribute indicating whether the student intends to carry on his or her master degree within the same department. Demonstrate an instance of the *Undergraduate* class in a simple program.