

UNIVERSITY OF LONDON

GOLDSMITHS COLLEGE

B. Sc. Examination 2014

Computing

IS51008B Introduction To Programming

Duration: 2 hour 15 minutes

Date and time:

This paper is in two parts: part A and part B. There is one question in part A and 3 in part B. You should answer the one question from part A and two questions from part B. Your answers to part A and part B should be written in separate answer books.

Full marks will be awarded for complete answers to a total of three questions, one from part A and two from part B. The question in part A carries 20 marks. Each question in part B carries 10 marks. The marks for each part of a question are indicated at the end of the part in [.] brackets.

The first few sections of each question in part B are multiple choice. You should choose one and only one answer and write down the letter of your chosen answer

There are 40 marks available on this paper.

No calculators should be used.

**THIS PAPER MUST NOT BE REMOVED
FROM THE EXAMINATION ROOM**

PART A

Question 1

This question relates to the mini-project that you did in the second term.

(a) Briefly describe your project [1]

(b) Did you use arrays in your program? If so describe why you chose arrays and give a detailed description of how you used them, giving at least one concrete example. If not, explain why they were not necessary and describe what alternative techniques you used for storing data and why they were more appropriate (giving at least one concrete example) [9]

4 marks will be awarded for the quality of description and 5 for the quality of the code described.

(c) Describe the structure of your program: how you divided it into classes, function and other high level elements. Explain why you chose to structure it in the way you did. [10]

5 marks will be awarded for the quality of description and 5 for the quality of the code described.

PART B

Question 2

Parts (a) to (d) of this question are multiple choice. Please choose only *one* answer and write down the letter corresponding to that answer.

- (a) What is the return type of this function? [1]

```
1      int number(float a)
2      {
3          String x = "hello";
4          return x.length();
5      }
```

- a) int
- b) number
- c) float
- d) String

- (b) You are writing a twitter client. Which of the following would you use an array for (choose one)? [1]

- a) the user's twitter handle
- b) the user's latest tweets
- c) posting a new tweet
- d) attaching an image to a tweet

- (c) What is wrong with the following code? [1]

```
1 void setup()
2 {
3     size(100, 100);
4     float a = 3;
5 }
6
7 void draw()
8 {
9     ellipse(10, 10, a, a);
10 }
```

- a) background is not called
- b) you cannot assign a whole number (3) to a float variable

- c) ellipse must have an integer variable as a parameter
- d) a does not exist in draw

(d) This is a basic class representing a playlist of songs. You can assume that Song is a class representing a song which have a member variable “name” that contains the title of the song. Which is the correct definition of a member function to display all the song titles? [1]

```
class Playlist
{
    Song [] songs
    Playlist()
    {
        songs = new Song[0];
    }
    void add(Song s)
    {
        songs = (Song []) append(songs, s);
    }
}
```

- a)

```
void displayTitles()
{
    for(int i = 0; i < songs.length; i++)
    {
        text(playlist.songs[i].name, 50, 50*i);
    }
}
```
- b)

```
void displayTitles()
{
    for(int i = 0; i < songs.length; i++)
    {
        text(names[i], 50, 50*i);
    }
}
```
- c)

```
void displayTitles(Song [] songs)
{
    for(int i = 0; i < songs.length; i++)
    {
        text(songs[i].name, 50, 50*i);
    }
}
```

d)

```
void displayTitles()
{
    for(int i = 0; i < songs.length; i++)
    {
        text(songs[i].name, 50, 50*i);
    }
}
```

- (e) Timelines are a common feature in social networks. They display important events that have occurred to a user, such as status updates, interactions with other users and add new photographs. Design a class to represent a timeline including member variables, functions and an outline description of how it might be implemented [6]

Question 3

Parts (a) to (d) of this question are multiple choice. Please choose only *one* answer and write down the letter corresponding to that answer.

- (a) Look at the following code: [1]

```
1      class A{
2          int b = 0;
3
4          void c(float d)
5          {
6
7          }
8      }
```

which of these is a member function?

- a) A
b) b
c) c
d) d
- (b) You need to design a class to represent an obstacle in a racing game. Which of the following would you **not** choose as a member variable of that class (choose one)? [1]

- a) a collision between a car and the obstacle
b) the width of the obstacle
c) how much damage the obstacle causes
d) an image that represents the appearance of the obstacle.

- (c) This code is supposed to pause a game, but the ball keeps on moving, what should you change? [1]

```
1  if(paused == true)
2  {
3      text("paused", width/2, height/2);
4  }
5  ball.update();
```

- a) line 1 should read `if(paused == false)`
b) line 1 should have a semi-colon at the end
c) line 5 should be inside the if statement
d) the if statement should have an else branch containing line 5

- (d) What does the following program do? [1]

```

1
2 String [] names;
3
4 void setup()
5 {
6     names = new String [3];
7     names[0] = "Tom";
8     names[1] = "Dick";
9     names[2] = "Harry";
10 }
11
12 int find(String query){
13     for(int i = 0; i < names.length; i++)
14     {
15         if(names[i].equals(query)
16         {
17             return i;
18         }
19     }
20     return -1;
21 }
22
23 void draw()
24 {
25     println(find("Jane"));
26     noLoop();
27 }

```

- a) throws a Null Pointer Exception
 - b) throws an Array Index Out Of Bounds Exception
 - c) prints 3
 - d) prints -1
- (e) A fellow student has posted the following question on a forum. Answer the question as helpfully as you can. [6]

Hi, I am trying to make a music player and have created this class to represent a track, but it doesn't work. What is wrong? Any suggestions for improvement?

```

1
2     int audioPlayer;
3     int name;
4     int length;
5

```

```
6      class Track
7      {
8          track(fileName, trackname)
9          {
10             audioPlayer = minim.loadFile(fileName);
11             name = trackname;
12             length = audioplayer.getLength();
13         }
14
15         void play()
16         {
17             audioPlayer.play();
18             text(name, 10, 10);
19             text(length, 30, 10);
20         }
21     }
```


Question 4

Parts (a) to (d) of this question are multiple choice. Please choose only *one* answer and write down the letter corresponding to that answer.

(a) How many items are there in this array? [1]

```
1      int [] myArray = new int [10];
```

- a) 9
- b) 10
- c) 11
- d) none

(b) What type would you use to represent the name of a song? [1]

- a) int
- b) float
- c) String
- d) PImage

(c) What is wrong with the following class definition? [1]

```
1      class A
2      {
3          int x,y;
4          void A (int c)
5          {
6              x = c;
7              y = c;
8          }
9          void draw()
10         {
11             point(x,y);
12         }
13     }
```

- a) You cannot have a single letter class name
- b) The constructor cannot have a return type
- c) You cannot set both x and y based on one parameter c
- d) You cannot have a member function called draw, because that is a built in name in Processing.

(d) What is printed by this program? [1]

```
1      print ("a");
2      if (false)
3      {
4          print ("b");
5      }
6      else
7      {
8          print ("c");
9      }
10     print ("d");
```

- a) ad
 - b) b
 - c) abd
 - d) acd
- (e) You are developing an endless running game, such as Temple Run, in which the player must continuously run along a track avoiding obstacles. How would you implement the track?

[6]