SINGAPORE POLYTECHNIC

20xx/20xx SEMESTER ONE END OF SEMESTER TEST

COMMON INFOCOMM TECHNOLOGY PROGRAMME
DIPLOMA IN APPLIED AI & ANALYTICS
DIPLOMA IN CYBERSECURITY & DIGITAL FORENSICS
DIPLOMA IN INFORMATION TECHNOLOGY

FIRST YEAR FULL TIME

FUNDAMENTALS OF PROGRAMMING

Time Allowed: 2 Hours

Name : ____________________________________ Class : ________________________

Admission No. : ____________________________________

Instructions to Candidates

1. This paper consists of 12 pages (inclusive of cover page).
2. Answer **ALL** questions.
   - This is a **RESTRICTED OPEN BOOK Test.** You may refer to Lecture notes, Practical solutions on **your laptop ONLY**. NO physical notes are allowed.
   - You are NOT allowed to access the module materials on the BrightSpace and online material related to JavaScript coding.
   - **Do NOT use any communication software or access any websites that provide online e-communication (e.g. Web WhatsApp ,etc). Any form of communication online or offline is prohibited. Anyone caught doing so will be considered cheating which may result in FAILING the module or all the modules, suspension or expulsion.**
   - **You are NOT allowed to use Generative AI tool (example: ChatGPT co-pilot, Visual Studio Code Co-Pilot or any form of Generative AI plug-in) for the Test. Anyone caught doing so will be considered cheating which may result in failing the module or all the modules, suspension or expulsion.**
3. You are NOT allowed to use any sorting libraries or array instance methods, except for .push( ) & .pop( ) in your solution. The construct forEach() is NOT allowed.
4. Only loops syntax taught in lecture slides are accepted.
5. If you require A4 paper for rough work, please request it from the invigilator.
6. You are NOT allowed to connect to wi-fi during the test unless instructed by the invigilator. Recording of any form is NOT allowed.
7. You are required to **return the Question paper** before you leave the room.

Instructions BEFORE you start the test:

1. Turn on Wi-Fi. Login to the course site for ST0523 FOP in BrightSpace.
2. Check that your question paper is Set A (refer to the top right corner of this paper).
3. Go to BrightSpace unit **Continual Assessment** > **MOCK EST** to download **MOCKEST.js**
4. Make a copy of SETA.js in your FOP folder or your own folder where you usually run JavaScript program.
5. Rename the file using the following convention i.e. **MxxxxxName.js** where xxxxxx is your admin number followed by your name. The file extension must be .js

   For example :
   The file M12345TanAhMeng.js is done by Tan Ah Meng, admin number 12345.

   You should work on and submit the renamed file above for your practical test.
6. Start Visual Studio. Ensure that you have readline-sync installed.

```
To install readline sync at command prompt> npm install
readline-sync
```

7. Once you are ready, **TURN OFF** your wi-fi.
8. Do **NOT** start until the invigilator tells you to do so.

Instructions when you have completed the test or when the duration of test is up:

1. Ensure that your JavaScript file is renamed according to the instructions above.
2. Stop coding once the test is over, the invigilator will inform you.
3. Wait for the invigilator's instructions to allow you to turn on the wi-fi on your laptop.
4. You are only given **5 minutes** to submit your file in BrightSpace.
   - submit your program e.g. A12345TanAhMeng.js to this folder :

     Continual Assessments > MOCK EST > MOCK EST Submission
   - only **ONE** submission is allowed
5. Do **NOT** delete your program from your laptop and do **NOT** modify it. An exact copy MUST be kept in your laptop after you have submitted a copy to BrightSpace.
6. Return the Question paper to the invigilator(s) before you leave the venue.

JavaScript Syntax List

Operator Precedence

Highest	++var ,var++, --var, var--
	! (Not)
	** (Exponentiation)
	*, /, % (Multiplication, Division and Modulus)
	+, - (Binary addition and subtraction)
	<, <=, >, >= (Comparison)
	==, !=; (Equality)
	&& (Conditional AND)
	|| (Conditional OR)
Lowest	=, +=, -=, *=, /=, %= (Assignment) operator)

The if statement

```
if ( condition ) {
  // block of code
}
```

The else statement

```
if ( condition ) {
  // block of code
} else {
  // block of code
}
```

The else if statement

```
if ( condition1 ) {
  // block of code
} else if ( condition2 ) {
  // block of code
} else {
  // block of code
}
```

The for loop

```
for (statement 1; statement 2; statement 3) {
  // block of code
}
```

The while loop

```
while ( condition ) {
  // block of code
}
```

Math.floor(Math.random( ) * x) will return a random integer between 0 and (x-1).

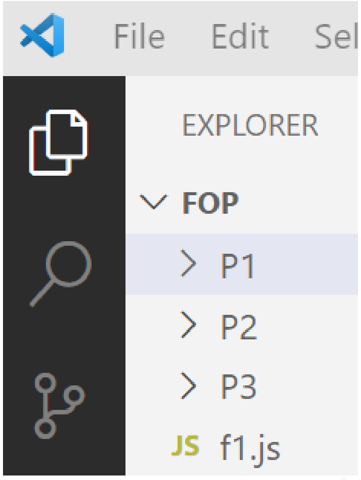
Math.abs(x) returns the absolute value of a number.
e.g Math.abs(-4) results in 4

```
process.stdout.write();       //Continuously prints information and
                                does not add new line.
console.log("xxxx" );         //prints content xxxx on a new line
```

```
//sample codes to prompt user to enter an input
const readline = require('readline-sync');
let userInput = readline.question("Enter name: ");
console.log("My name is " + userInput);
```

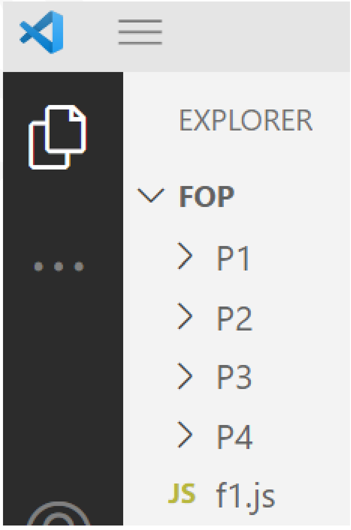
To install readline sync at command prompt>npm install readline-sync

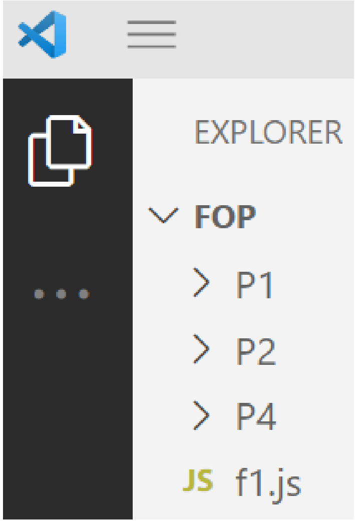
Common command prompts :

Command Prompt	**Remarks**
dir	To list the files/folders in the current folder, assuming FOP has 3 folders (P1, P2 and P3) and 1 file (f1.js): **C:\FOP > dir**  File Edit Sel EXPLORER FOP P1 P2 P3 JS f1.js

cd..	To navigate one level up :
	C:\FOP> cd..
	C:\>

cd P1	To navigate to folder P1:
	C:\FOP> cd P1
	C:\FOP\P1>

mkdir P4	To make a new folder P4: **C:\FOP>mkdir P4** 

rmdir P3	To remove folder P3: **C:\FOP>rmdir P3**  Folder P3 is deleted

You are tasked to write a Javascript program to automate the sale of park tickets. Users can choose to purchase combo tickets at peak or off-peak period. User has a choice to chose 2 out of the 4 parks, but the ticket price per head will be higher if ‘Night Safari’ is one of the chosen park.

1. Complete the function **displayMenu** that:
    - does not have any parameter,
    - does not return any value,
    - display the output as shown below

      [Hint: Use console.log statements]

```
Menu for Peak and Off-Peak Park Selection:
==========================================
B for Bird Paradise
N for Night Safari
R for River Wonders
Z for Singapore Zoo
```

2. The ticket prices shown in Table 1 is used to calculate the total price tickets based on type of tickets and parks selection of the user.

Type of Tickets	**Ticket combo set**	**Day Parks Available**	**Ticket Price Per head**
Peak Season	Choice of any day TWO parks	- Bird Paradise - River Safari - Singapore Zoo	Adult : $58 Child : $38
	Night Safari + Choice of ONE day park	- Bird Paradise - River Safari - Singapore Zoo	Adult : $68 Child : $48
Off-Peak Season	Choice of any day TWO parks	- Bird Paradise - River Safari - Singapore Zoo	Adult : $35 Child : $15
	Night Safari + Choice of ONE day park	- Bird Paradise - River Safari - Singapore Zoo	Adult : $45 Child : $25

Table 1

Complete the function **calculateTotalCost** that:

- does not have any parameter,
- does not return any value,
- prompts user to enter the type of tickets, 2 out of the 4 parks and the number of adults and child tickets required
- does not require any data validation, you may assume user will always enter the correct data
- calculates the total cost of the tickets
- allows the user to keep buying ticket(s) until he/she chooses ‘0’ to quit the program.

Sample output when function is invoked, text in **bold** are user input:

```
Menu for Peak and Off-Peak Park Selection:
==========================================
B for Bird Paradise
N for Night Safari
R for River Wonders
Z for Singapore Zoo
Enter period (P-Peak or O-Off Peak): P
Enter first park (B/N/R/Z): B
Enter second park (B/N/R/Z): Z
How many adults? 1
How many children? 1
Total cost: $96
Enter 1 to continue or 0 to quit: 1

Menu for Peak and Off-Peak Park Selection:
==========================================
B for Bird Paradise
N for Night Safari
R for River Wonders
Z for Singapore Zoo
Enter period (P-Peak or O-Off Peak): P
Enter first park (B/N/R/Z): N
Enter second park (B/N/R/Z): R
How many adults? 1
How many children? 1
Total cost: $116
Enter 1 to continue or 0 to quit: 1

Menu for Peak and Off-Peak Park Selection:
==========================================
B for Bird Paradise
N for Night Safari
```

```
R for River Wonders
Z for Singapore Zoo
Enter period (P-Peak or O-Off Peak): P
Enter first park (B/N/R/Z): Z
Enter second park (B/N/R/Z): N
How many adults? 10
How many children? 0
Total cost: $680
Enter 1 to continue or 0 to quit: 1

Menu for Peak and Off-Peak Park Selection:
==========================================
B for Bird Paradise
N for Night Safari
R for River Wonders
Z for Singapore Zoo
Enter period (P-Peak or O-Off Peak): O
Enter first park (B/N/R/Z): N
Enter second park (B/N/R/Z): R
How many adults? 2
How many children? 2
Total cost: $140
Enter 1 to continue or 0 to quit: p
Input valid number, please.
Enter 1 to continue or 0 to quit: 0
Continue to execute the next line of code…
```

3. Table below contains information about Bird Paradise only.

   a. Create one object literal **birdParkInfo** to store the information using the values provided.

Object properties	Sample values	Data Type
address	20 Mandai Lake Road Singapore 729825	A string to indicate address
telephone	6269 3411	A string to indicate telephone number
noCafeResturants	5	An integer
noShows	2	An integer
rating	4.5	A floating number
noBirds	3700	An integer

   b. In the object literal **birdParkInfo,** create a method **displayParkInfo** to display the park details. This method does not return any values. Invoke the method **displayParkInfo** in the main program to display output shown below:

```
Bird Paradise Information
Address : 20 Mandai Lake Road Singapore 729825
Telephone : 6269 3411
There are 5 cafe/resturant in Bird Paradise
```

4. Below are the performances in Bird Paradise .

Performance cancelled?	Performance	Show location	Timing	Sponsor ID
No	Wings of the World	Sky Ampitheatre	12.30pm & 5.00pm	S01
Yes	Predators on Wings	Sky Ampitheatre	10.30am & 2.30pm	S03
No	WelcomeParty	Entrance	10.30am & 3.30pm	S03

a. Create three object literals to store the details of the performance for Bird Paradise using the values provided in the table above.

Object properties	**Description**
performance	A string to capture the name of performance.
location	A string to indicate the location.
timing	A string to indicate the timing.
sponsor	A string ID
performanceStatus	A string indicating if performance is cancelled.

b. Store the three object literals created above in an array **perfArray.**

c. Complete the function **displayPerformance** to display the performance information above only for those that is/are not cancelled. The function must fulfil the following requirements:

- has **ONE** parameter named **perfArr** to receive an array of performance objects,
- does not return any value,
- output the performance information in the function

Sample output:

```
Performane for today:
    1. Wings of the World at the Sky Ampitheatre (12.30pm & 5.00pm)
    2. WelcomeParty at the Entrance (10.30am & 3.30pm)
```

5. Below is the sponsor details of the performance.

Sponsor information

sID	**sName**	**sContact**
S01	WildBird Pte Ltd	info@wildbird.com
S02	Feather International	info@feather.com
S03	SaveMe Birds International	info@saveme.com

a) Create 3 sponsor object literals using the properties and values above. Store the object literals in array **sponsorArray**.

b) Complete the function **getSponsor** to get the sponsors' information that :

- has ONE parameter i.e. sponsor's ID,
- returns the sponsor object if the sponsor's ID exists in the array **sponsor**

c) Complete the function **displaySponsor** that :

- has ONE parameter i.e. array **sponsorArr**,
- does not return any value,
- output each sponsor's name along with its sponsor's name and contact information as shown below:

Invoke the function **displaySponsor** to display sponsor's details.

```
Performance: Wings of the World
Sponsor Name: WildBird Pte Ltd
Sponsor contact : info@wildbird.com
---
Performance: WelcomeParty
Sponsor Name: SaveMe Birds International
Sponsor contact : info@saveme.com
```

6. Assuming that Singapore Zoo has a long list of animals scheduled for photoshoot throught the year. You are tasked to produce a list of animals based the age and type of enclosure the animals are in. Below is a sample list of just four animals.

Object name	name	enclosure	age
animal1	Elephant	Tropical	8
animal2	Giraffe	Savannah	5
animal3	Komodo Dragon	Savannah	12
animal4	Zebra	Savannah	6

a) Create four animal object literals using the properties and values above. Store the object literals in array **zooArray**.

b) Complete the function **animalPhotoList** to display the list of animals scheduled for photoshoot. The function :

- has THREE parameters i.e. **zooArr, animalEnclosure** and **agelimit,**
- retrieves the animals that meet the criteria for photoshoot ie must be above the **agelimit** and placed in the enclosure **animalEnclosure,**
- display the output in the function .

Invoke the function **animalPhotoList** twice.

- First is to display the list of animals for age above 5 with enclosure value “Savannah”.
- Second is to display the list of animals for age above 6 and “Tropical”.

Sample output of when the function **animalPhotoList** is invoked twice :

```
Photoshoot list:
===============:
1. Komodo Dragon
2. Zebra
No. of animal(s) more than age 5 in Savannah:2

Photoshoot list:
===============:
1. Elephant
No. of animal(s) more than age 6 in Tropical:1
```

c) Complete the function **calculateAverageAge** that :

- has ONE parameter i.e. array **zooArr**,
- return the average age of all the animals to be displayed in the main program.
- The age displayed must also show in yy & mm format

[Hint : use Math.floor()]

Sample output:

```
Average age is 7.75 years ie 7 years and 9 months
```

- End –