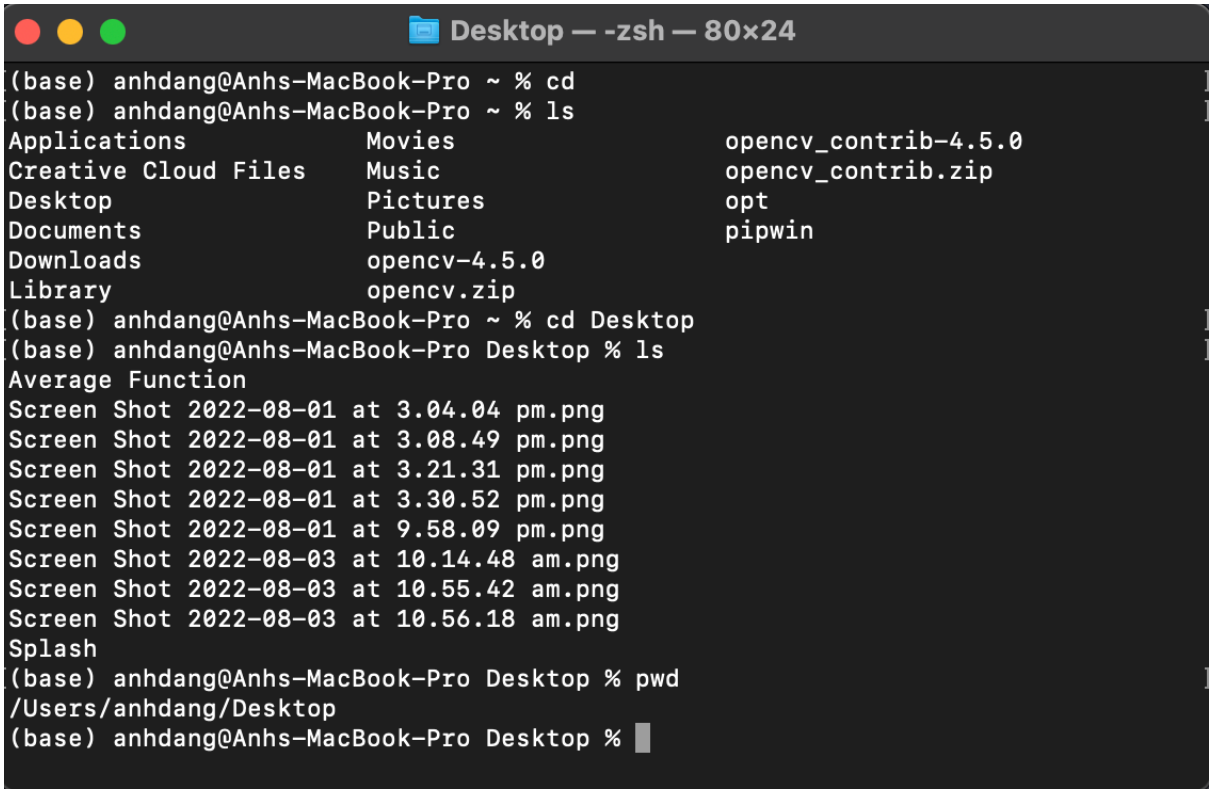
1.1P: Preparing for OOP – Answer Sheet

1. Explain the following terminal instructions:
    a. cd: Change Directory
    b. ls: List Files
    c. pwd: Print Directory



2. Consider the following kinds of information, and suggest the most appropriate data type to store or represent each:

Information	**Suggested Data Type**
A person's name	String
A person's age in years	Integer
A phone number	String or Integer
A temperature in Celsius	Float
The average age of a group of people	Integer
Whether a person has eaten lunch	Boolean

3. Aside from the examples already provided in question 2, come up with an example of information that could be stored as:

Data type	**Suggested Information**
String	Product name
Integer	Number of products
Float	Distance
Boolean	Is 2 an integer?

4. Fill out the following table, evaluating the value of each expression and identifying the data type the value is most likely to be:

Expression	**Given**	**Value**	**Data Type**
`6`		6	Integer
`True`		True	Boolean
`a`	`a = 2.5`	2.5	Integer
`1 + 2 * 3`		7	Integer
`a and False`	`a = True`	True	Boolean
`a or False`	`a = True`	True	Boolean
`a + b`	`a = 1` `b = 2`	3	Integer
`2 * a`	`a = 3`	6	Integer
`a * 2 + b`	`a = 2.5` `b = 2`	7.0	Integer
`a + 2 * b`	`a = 2.5` `b = 2`	6.5	Float

`(a + b) * c`	`a = 1`
	`b = 1`
	`c = 5`
		10	Integer

`"Fred" + " Smith"`		Fred Smith	String
`a + " Smith"`	`a = "Wilma"`	Wilma Smith	String

5. Using an example, explain the difference between **declaring** and **initialising** a variable.

D**eclaring** is used to specify the type of data for the variable. While **initializing** is used to set the value to its initial and it must be compatible to use in the **declaring** type of data.

```
int a //declare a variable
int a=35 //declare and initialize variable a=35
```

6. Explain the term **parameter**. Write some code that demonstrates a simple of use of a parameter. You should show a procedure or function that uses a parameter, and how you would call that procedure or function.

A parameter is a variables inside the method and it will be becoming an argument after passing to the method.

```
1   using System;
2   using SplashKitSDK;
3
4   public class Program
5   {
6       static void parameter(string name, int age) //name and age are parameter here
7       {
8           Console.WriteLine(name + " is " + age + " years old!");
9       }
10
11      static void Main()
12      {
13          Console.WriteLine("Name: ");
14          string name = Console.ReadLine();
15          Console.WriteLine("Age: ");
16          int age = Convert.ToInt32(Console.ReadLine());
17
18          parameter(name,age); //in this case name and age are arguments
19      }
20  }
```

7. Using an example, describe the term **scope**.

Scope is where variables can be accessed or referenced.

For example:
Local Scope:

```
def print_local_number()
        x = 10
        print(x)
print_local_number() #Calling this function will print its local variable in the function
```

as if you try to print it globally it will show an error in the terminal command

```
def print_local_number()
        x = 10
print(x) #This will show an error
```

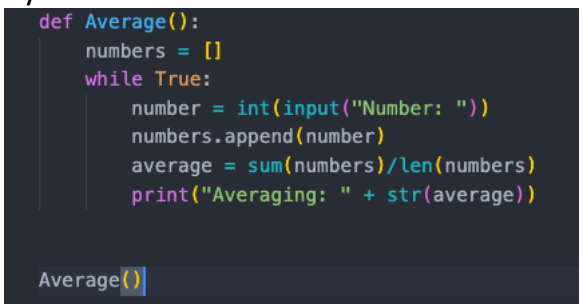
Global Scope:

```
x = 10 #Set this as global variable
def multiply()
        x = x * 5
        print(x)

multiply() #Variable x can be use globally in any function.
```

8. In any procedural language you like, write a function called Average, which accepts an array of integers and returns the average of those integers. Do not use any libraries for calculating the average. You must demonstrate appropriate use of parameters, returning and assigning values, and use of a loop. Note — just write the function at this point, we'll *use* it in the next task. You shouldn't have a complete program or even code that outputs anything yet at the end of this question.

Python:



```python
def Average():
    numbers = []
    while True:
        number = int(input("Number: "))
        numbers.append(number)
        average = sum(numbers)/len(numbers)
        print("Averaging: " + str(average))


Average()
```

C#:

```
{
    class Program
    {

        public static void Average(int[] arr, int size)
        {
            int sum = 0; //Setting initialize for Sum = 0
            for (int i = 0; i < size; i++) //This loop adding all the numbers in the array
            {
                sum += arr[i];
            }
            float average = (float)sum / size;
            Console.WriteLine("Current average is: " + average);
        }

        public static void Main(string[] args)
        {
            List<int> noList = new List<int>(); //Making new List
            while (true)
            {
                Console.WriteLine("Enter number");
                int no = Convert.ToInt32(Console.ReadLine()); //Turning String to Int
                noList.Add(no); //Adding input Number to List
                int[] no_arr = noList.ToArray(); //Converting List Arraay
                Average(no_arr, no_arr.Length); //Passing arguments to average Function
            }
        }
    }
}
```

9. In the same language, write the code you would need to call that function and print out the result.

These has been done in the previous question (question 8)

10. To the code from 9, add code to print the message “Double digits” if the average is above or equal to 10. Otherwise, print the message “Single digits”. Provide a screenshot of your program running.

```
using System;
using System.Collections.Generic;

namespace Average
{
    class Program
    {

        public static void Average(int[] arr, int size)
        {
            int sum = 0; //Setting initialize for Sum = 0
            for (int i = 0; i < size; i++) //This loop adding all the numbers in the array
            {
                sum += arr[i];
            }
            float average = (float)sum / size;
            Console.WriteLine("Current average is: " + average);
            checking_double_digit(average);
        }

        static void checking_double_digit(float avg)
        {
            if(avg < 10)
            {
                Console.WriteLine("Single Digit");
            }
            else if (avg >= 10 && avg < 100)
            {
                Console.WriteLine("Double Digit");
            }
        }

        public static void Main(string[] args)
        {
            List<int> noList = new List<int>(); //Making new List
            while (true)
            {
                Console.WriteLine("Enter number");
                int no = Convert.ToInt32(Console.ReadLine()); //Turning String to Int
                noList.Add(no); //Adding input Number to List
                int[] no_arr = noList.ToArray(); //Converting List Arraay
                Average(no_arr, no_arr.Length); //Passing arguments to average Function
            }
        }
    }
}
```

<insert a screenshot of your whole program running here>

```
Enter total of numbers:
2
Enter numbers:
20
Enter numbers:
30
Sum:50 Average is: 25
Double digit
```

```
Enter total of numbers:
2
Enter numbers:
10
Enter numbers:
4
Sum:14 Average is: 7
Is single digit
```