



Shenley Brook End Sixth Form

**Summer transition tasks for
Computer Science**

**Latest due date Monday 16 September 2024
Preferably first computer science lesson**

Computer Science A level
Summer Work

Exam Board

OCR – Computer Science A Level: H446

Objectives

The summer work is to ensure that you focus on the elements of a computer system, considering the components of Input, Process and Output (I-P-O) and to prepare for the programming language of the A level course.

Tasks

There are two tasks which are to be submitted in early September (preferably in the first computer science lesson). They are to be word processed and printed out to be handed in. Put your name in the header of the document so it appears on each page and put the page number in the footer of the document. The layout for each task is stated in the description for each.

Resources

For task 1 use the internet to search for suitable devices and how they are used, but do not simply cut and paste descriptions – use your own words.

For task 2 you will need to download a suitable compiler to your home computer, preferably Virtual pascal 2.1 (VP21) from <https://www.softpedia.com/get/Programming/Coding-languages-Compilers/Virtual-Pascal.shtml>

(If you are unable to get this working you can use Lazarus: <https://www.lazarus-ide.org/index.php?page=downloads> or an online pascal compiler, eg: https://www.onlinegdb.com/online_pascal_compiler Free Pascal is another compiler similar to VP21: <https://www.freepascal.org/download.html>) as is Turbo Pascal, available from various sites.)

VP21 is the preferred compiler, unfortunately it is not available for Mac computers. If you have a laptop you can use it at home and bring it in to school to use in lessons. Note: VP21 works best on old (especially very old) Windows® computers so you do not need (and are advised not) to have an expensive top-end laptop in school. An old one at home or a cheap refurbished laptop would be ideal.

Wider Reading

The A level course at Shenley Brook End School uses Pascal as the programming language to teach both the required theory and programming for the coursework. It is an excellent teaching language and uses the required data structures for the exams. It would be useful to familiarise yourself with the language using online material, eg:

<https://www.tutorialspoint.com/pascal/index.htm>

Computer Science Summer Task

Task 1

A computer system is made up of three main components:

- Input Devices
- The processor/computer
- Output Devices

Research as many different devices as you can find and categorise them appropriately, stating one application for each that it could be used for.

Make sure that you identify the actual device, and not just the method. For example:

- Optical Character Recognition is a method; the input device is a(n optical character) scanner.
- Voice recognition is a method; the input device required is a microphone.

For input device make sure you identify what is being input and why. Lay out your results clearly. For example:

Input Devices

Device	An application
Mouse	Entering the continuous locations (x,y coordinates) of the mouse as is it moved by the user to navigate a pointer (as output by the computer) on the screen to move to an icon of an application. It also inputs a signal to the computer when a button is pressed by the user to indicate selection.
Keypad	Entering digits (of a PIN and amount of money) required when using a cashpoint (ATM)
etc	

Do this for all the input devices and output devices that you can find.

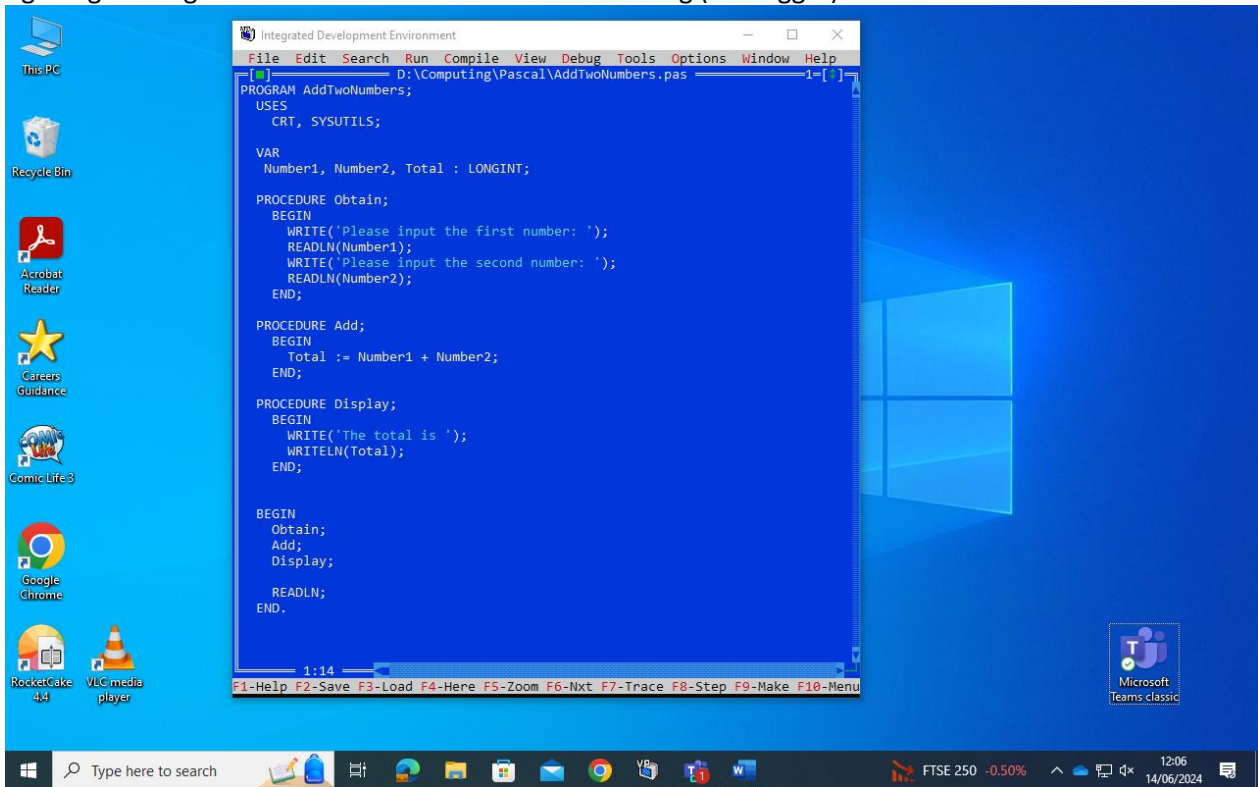
For the processor/computer, identify the different types there are (for example, personal desktop computer, laptop, etc. Do not list brand names.) For each type, again give an application when it might be appropriate to use.

There should be three tables submitted; one for input devices, one for output devices and one for processors/computers.

Make sure that the input and output tables are specifically entering or outputting data/information and not carrying out a process. (For example, if you write for the input device mouse “controlling/moving the cursor on the screen” you are not stating the input. Control/move is a process and showing something on a monitor is output. Consider what the input is! To help you it’s best to start each input device with “Entering ...” or “To input ...”).

Task 2

- Download VP21 as stated in the “Resources” section and install it on your computer (or use another Pascal compiler).
- Enter the program given at the end of this task (PROGRAM AddTwoNumbers;) exactly as shown, ie use capital letters where used, lowercase (camel case), indentation, spaces, blank lines etc as shown.
- Take a screenshot of the program in VP21 (or equivalent) and paste it into your Word document on its own page large enough to read. It should look like the following (but bigger):



The screenshot shows an IDE window titled 'Integrated Development Environment' with a menu bar (File, Edit, Search, Run, Compile, View, Debug, Tools, Options, Window, Help) and a toolbar. The code in the editor is as follows:

```
PROGRAM AddTwoNumbers;
USES
  CRT, SYSUTILS;

VAR
  Number1, Number2, Total : LONGINT;

PROCEDURE Obtain;
BEGIN
  WRITE('Please input the first number: ');
  READLN(Number1);
  WRITE('Please input the second number: ');
  READLN(Number2);
END;

PROCEDURE Add;
BEGIN
  Total := Number1 + Number2;
END;

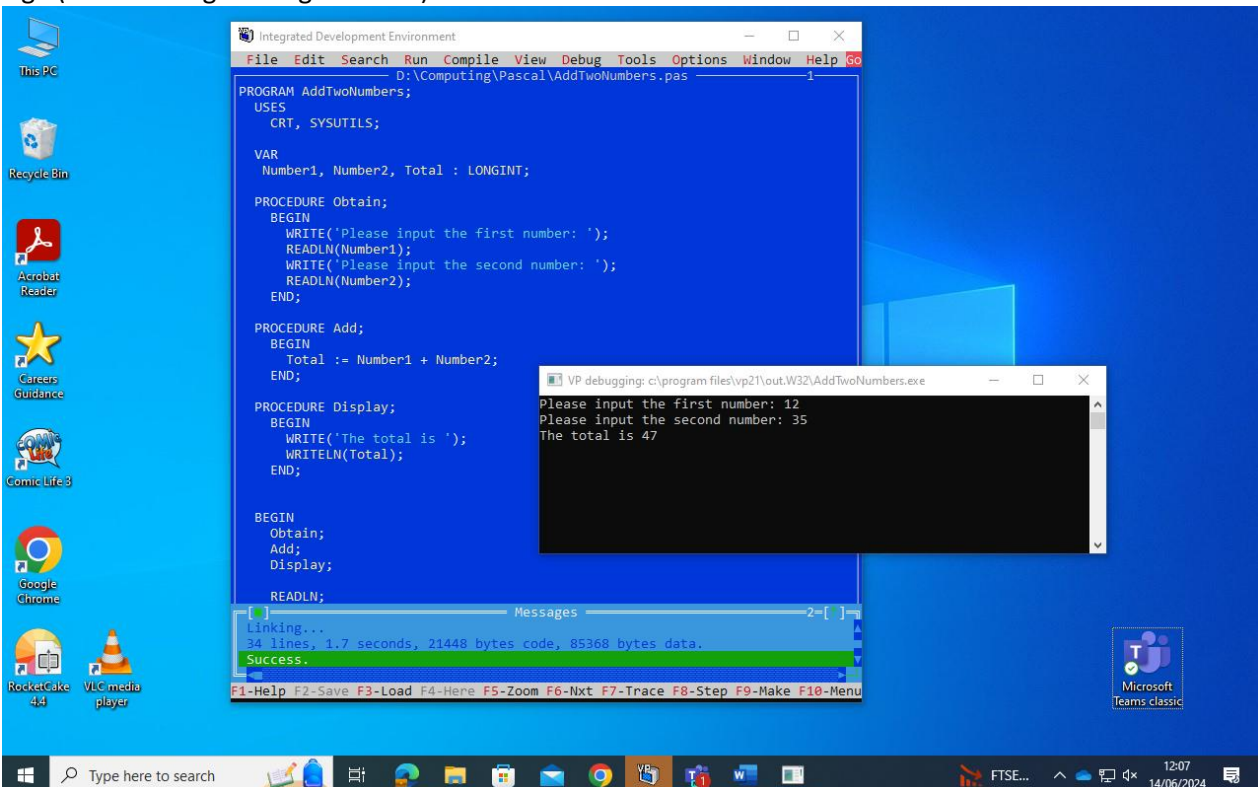
PROCEDURE Display;
BEGIN
  WRITE('The total is ');
  WRITELN(Total);
END;

BEGIN
  Obtain;
  Add;
  Display;

  READLN;
END.
```

The IDE status bar shows '1:14' and a keyboard shortcut menu (F1-Help, F2-Save, F3-Load, F4-Here, F5-Zoom, F6-Nxt, F7-Trace, F8-Step, F9-Make, F10-Menu). The Windows taskbar at the bottom shows the search bar, taskbar icons, and system tray with the date '14/06/2024' and time '12:06'.

- Take a screen shot of the output of your program running and paste it into your Word document on its own page (and also large enough to read). It should look like:



The screenshot shows the same IDE window as above, but with a 'Messages' window open at the bottom. The code is the same as in the previous screenshot. The 'Messages' window shows the following output:

```
Linking...
34 lines, 1,7 seconds, 21448 bytes code, 85368 bytes data.
Success.
```

Overlaid on top of the IDE is a 'VP debugging' window titled 'c:\program files\vp21\out\W32\AddTwoNumbers.exe'. It shows the program's execution output:

```
Please input the first number: 12
Please input the second number: 35
The total is 47
```

The IDE status bar now shows '2:=[]' and the Windows taskbar shows the time '12:07'.

```

PROGRAM AddTwoNumbers;
  USES
    CRT, SYSUTILS;

  VAR
    Number1, Number2, Total : LONGINT;

  PROCEDURE Obtain;
  BEGIN
    WRITE('Please input the first number: ');
    READLN(Number1);
    WRITE('Please input the second number: ');
    READLN(Number2);
  END;

  PROCEDURE Add;
  BEGIN
    Total := Number1 + Number2;
  END;

  PROCEDURE Display;
  BEGIN
    WRITE('The total is ');
    WRITELN(Total);
  END;

  BEGIN
    Obtain;
    Add;
    Display;

    READLN;
  END.

```

Submission Date (for students)

Monday 16 September