STOKE DAMEREL

Aspire Achieve Thrive

Spring Term

Term 2

Computer Science

Year 11

Name: _____

Tutor: _____

GREENSHAW LEARNING TRUST

Year 11 Homework Timetable

Monday	Science Task 1	Ebacc Option A Task 1	Option C Task 1
Tuesday	Sparx Science	Option B Task 1	Modern Britain Task 1
Wednesday	English Task 1	Science Task 2	Option C Task 2
Thursday	Ebacc Option A Task 2	Option B Task 2	Sparx Catch Up
Friday	Modern Britain Task 2	English Task 2	Sparx Maths

Sparx Science

- **Complete 100% of their assigned homework each week**

Sparx Maths

- **Complete 100% of their assigned homework each week**

Option A (EBACC)
French
Geography
History

Option B
Art
Business Studies
Catering
Computer Science
History
Health & Social Care
Music
Sport
IT

Option C
Business Studies
Childcare
Catering
Drama
Geography
Health & Social Care
Triple Science
Sport

Half Term 3 (5 weeks) - Year 11		
Week / Date	**Homework task 1** **Cornell Notes**	**Homework task 2** **Exam Question**
Week 1 8th January 2024	**Cornell Notes on:** 2.2.1 Variables, constants, inputs, outputs and assignment	**Question**: Describe what is meant by a variable. Identify variables in a program.
Week 2 15th January 2024	**Cornell Notes on:** 2.2 The 3 basic programming constructs 2.2 Arithmetic and comparison operators	**Question**: Identify programming constructs in a program. Demonstrate an understanding of DIV (//) and MOD (%) operations.
Week 3 22nd January 2024	**Cornell Notes on:** 2.2 Boolean operators	**Question**: Tracing code (loops)
Week 4 29th January 2024	**Cornell Notes on:** 2.2 Data types and casting 2.2 The use of basic string manipulation	**Question:** String manipulation and concatenation
Week 5 5th February 2024	**Cornell Notes on:** 2.2 The use of basic file handling	**Question**: Pseudocode algorithm for a program

Half Term 4 (6 weeks) - Year 11		
Week / Date	**Homework task 1 Cornell Notes**	**Homework task 2 Exam Question**
Week 6 19th February 2024	**Cornell Notes on:** 2.2 The use of records to store data 2.2 The use of SQL to search for data	**Question**: Pseudocode algorithm with a list data structure. SQL statements
Week 7 26th February 2024	**Cornell Notes on:** 2.2 The use of arrays	**Question**: Pseudocode algorithm using iteration and an array data structure.
Week 8 4th March 2024 **Mock Exams**		
Week 9 11th March 2024 **Mock Exams**		
Week 10 18th March 2024	**Cornell Notes on:** 2.2 How to use subprograms 2.2 Random number generation	**Question**: Psuedocode algorithm using a function and 2D arrays.
Week 11 25th March 2024	**Cornell Notes on:** 2.3 Defensive design considerations 1 and 2	**Question**: Examples of defensive design

WEEK 1: Cornell Notes (Homework task 1)

Date 08 / 01 / 24	**Topic:** 2.2 Variables, constants, inputs, outputs & assignments	ClearRevise Pages 61 and 62

Go to the OCR GCSE (J277) Videos Page and make notes on the following videos:

2.2 Variables, constants, inputs, outputs & assignments

Questions

Notes

Summary

WEEK 1: Exam Question (Homework task 2)

A programmer has written an algorithm to output a series of numbers. The algorithm is shown below:

```
01    for k = 1 to 3
02      for p = 1 to 5
03        print (k + p)
04      next p
05    next k
06    m = 7
07    print m * m
```

Question:
Describe what is meant by a variable.

Answer:

[2 marks]

Question:
Identify two variables that have been used in the algorithm above.

Answer:

1	
2	

[2 marks]

WEEK 1: Exam Question review and improvement (Classwork)

A programmer has written an algorithm to output a series of numbers. The algorithm is shown below:

```
01    for k = 1 to 3
02      for p = 1 to 5
03        print (k + p)
04      next p
05    next k
06    m = 7
07    print m * m
```

Question:
Describe what is meant by a variable.

Answer:

[2 marks]

Question:
Identify two variables that have been used in the algorithm above.

Answer:

1	
2	

[2 marks]

WEEK 2: Cornell Notes (Homework task 1)

Date 15 / 01 / 24	**Topic:** 2.2 The 3 basic programming constructs 2.2 Arithmetic and comparison operators	ClearRevise Pages 63, 64 and 65

Go to the OCR GCSE (J277) Videos Page and make notes on the following videos:

2.2 The 3 basic programming constructs

2.2 Arithmetic and comparison operators

Questions

Notes

Summary

WEEK 2: Exam Question (Homework task 2)

The area of a circle is calculated using the formula π × r2 where π is equal to 3.142 and r is the radius.

A program is written to allow a user to enter the radius of a circle as a whole number between 1 and 30, then calculate and output the area of the circle.

```
01    radius = 0
02    area = 0.0
03    radius = input("Enter radius")
04    if radius < 1 OR radius > 30 then
05      print("Sorry, that radius is invalid")
06    else
07      area = 3.142 * (radius ^ 2)
08      print (area)
09    endif
```

Question:
Tick (✓) one box in each row to identify whether each programming construct has or has not been used in the program.

Answer:

	Has been used	Has not been used
Sequence		
Selection		
Iteration		

[3 marks]

Question:
DIV and MOD are both operators used in computing-related mathematics. State the value of 13 DIV 4

Answer:

[1 marks]

Question:
DIV and MOD are both operators used in computing-related mathematics. State the value of 13 MOD 4

Answer:

[1 marks]

Question:
A programmer declares the following variables.

```
first = "Computer Science"
second = "is great"
```

State the output from the following lines of program code.

Answer:

`print(first.length)`	
`print(second.length DIV 3)`	
`print(3 ^ 2)`	

[3 marks]

WEEK 2: Exam Question review and improvement (Classwork)

The area of a circle is calculated using the formula π × r2 where π is equal to 3.142 and r is the radius.

A program is written to allow a user to enter the radius of a circle as a whole number between 1 and 30, then calculate and output the area of the circle.

```
radius = 0
area = 0.0
radius = input("Enter radius")
if radius < 1 OR radius > 30 then
  print("Sorry, that radius is invalid")
else
  area = 3.142 * (radius ^ 2)
  print (area)
endif
```

Question:
Tick (✓) one box in each row to identify whether each programming construct has or has not been used in the program.

Answer:

	Has been used	Has not been used
Sequence		
Selection		
Iteration		

[3 marks]

Question:
DIV and MOD are both operators used in computing-related mathematics. State the value of 13 DIV 4

Answer:

[1 marks]

Question:
DIV and MOD are both operators used in computing-related mathematics. State the value of 13 MOD 4

Answer:

[1 marks]

Question:
A programmer declares the following variables.

```
first = "Computer Science"
second = "is great"
```

State the output from the following lines of program code.

Answer:

`print(first.length)`	
`print(second.length DIV 3)`	
`print(3 ^ 2)`	

[3 marks]

WEEK 3: Cornell Notes (Homework task 1)

Date 22 / 01 / 24	**Topic:** 2.2 Boolean operators	ClearRevise Pages 61 to 65

Go to the OCR GCSE (J277) Videos Page and make notes on the following videos:

2.2 Boolean operators

Questions

Notes

Summary

WEEK 3: Exam Question (Homework task 2)

Question:
An infinite loop is where a section of a program repeats indefinitely.

For each of the pseudocode algorithms shown below, tick (✓)the appropriate box to show whether they will loop infinitely or not.

Answer:

Pseudocode	**Will loop infinitely**	**Will <u>not</u> loop infinitely**
01 x = 0 02 while True 03 print x 04 endwhile		
01 x = 0 02 while x < 10 03 print x 04 endwhile		
01 x = 0 02 while x < 10 03 print x 04 x = x + 1 04 endwhile		
01 y = 5 02 for x = 1 to y 03 print x 04 next		

[4 marks]

WEEK 3: Exam Question review and improvement (Classwork)

Question:
An infinite loop is where a section of a program repeats indefinitely.

For each of the pseudocode algorithms shown below, tick (✓)the appropriate box to show whether they will loop infinitely or not.

Answer:

Pseudocode	**Will loop infinitely**	**Will <u>not</u> loop infinitely**
01 x = 0 02 while True 03 print x 04 endwhile		
01 x = 0 02 while x < 10 03 print x 04 endwhile		
01 x = 0 02 while x < 10 03 print x 04 x = x + 1 04 endwhile		
01 y = 5 02 for x = 1 to y 03 print x 04 next		

[4 marks]

WEEK 4: Cornell Notes (Homework task 1)

Date 29 / 01 / 24	**Topic:** 2.2 Data types and casting 2.2 The use of basic string manipulation	ClearRevise Pages 66 and 67

Go to the OCR GCSE (J277) Videos Page and make notes on the following videos:

2.2 Data types and casting

2.2 The use of basic string manipulation

Questions

Notes

Summary

WEEK 4: Exam Question (Homework task 2)

Taylor is writing an algorithm to record the results of an experiment. Taylor needs to be able to enter a numeric value which is added to a total which initially starts at 0.

Every time she enters a value, the total is output. The algorithm repeats until the total is over 100. The input to the program could be an integer or real value.

Question:
State what is meant by a real data type **and** give an example of this data type.

Answer:

[2 marks]

Question:
State what is meant by an integer data type **and** give an example of this data type

Answer:

[2 marks]

Taylor is writing an algorithm to record the results of an experiment. Taylor needs to be able to enter a numeric value which is added to a total which initially starts at 0.

Every time she enters a value, the total is output. The algorithm repeats until the total is over 100. The input to the program could be an integer or real value.

Question:
A programmer declares the following variables.

```
first = "Computer Science"
second = "is great"
```

Strings can be concatenated (joined together) using the + operator. For example, `print("Maths " + second)` will output *Maths is great*

Use string manipulation with the variables first and/or second to produce the following outputs.

Answer:

string to produce	**command**
`great`	
`Computer`	
`Science is great`	

[3 marks]

WEEK 5: Cornell Notes (Homework task 1)

Date 05 / 02 / 24	**Topic:** 2.2 The use of basic file handling	ClearRevise Pages 72

Go to the OCR GCSE (J277) Videos Page and make notes on the following videos:

2.2 The use of basic file handling

Questions

Notes

Summary

WEEK 5: Exam Question (Homework task 2)

A library gives each book a code made from the first three letters of the book title in upper case, followed by the last two digits of the year the book was published. A function: **librarycode()** has been written to take in the book title and year as parameters and return the book code;

```
01    function librarycode (title, year)
02      parta = title.subString (0,3)
03      partb = year.subString (2,2)
04      return parta.upper + partb
05    endfunction
```

For example, “Poetry from the War”, published in 2012 would be given the code POE12

Question:
Use pseudocode to write an algorithm that does the following :

- Inputs the title and year of a book from the user.
- Uses the librarycode function above to work out the book code.
- Permanently stores the new book code to the text file bookcodes.txt

Answer:

[6 marks]

WEEK 5: Exam Question review and improvement (Classwork)

A library gives each book a code made from the first three letters of the book title in upper case, followed by the last two digits of the year the book was published. A function: **librarycode()** has been written to take in the book title and year as parameters and return the book code;

```
01    function librarycode (title, year)
02      parta = title.subString (0,3)
03      partb = year.subString (2,2)
04      return parta.upper + partb
05    endfunction
```

For example, “Poetry from the War”, published in 2012 would be given the code POE12

Question:
Use pseudocode to write an algorithm that does the following :

- Inputs the title and year of a book from the user.
- Uses the librarycode function above to work out the book code.
- Permanently stores the new book code to the text file bookcodes.txt

Answer:

[6 marks]

WEEK 6: Cornell Notes (Homework task 1)

Date 19 / 02 / 24	**Topic:** 2.2 The use of records to store data 2.2 The use of SQL to search for data	ClearRevise Pages 70 and 71

Go to the OCR GCSE (J277) Videos Page and make notes on the following videos:

2.2 The use of records to store data

2.2 The use of SQL to search for data

Questions

Notes

Summary

WEEK 6: Exam Question (Homework task 2)

OCR High School uses a computer system to store data about students' conduct. The system records good conduct as a positive number and poor conduct as a negative number. A TRUE or FALSE value is also used to record whether or not a letter has been sent home about each incident.

An example of the data held in this system is shown below

StudentName	Detail	Points	LetterSent
Kirstie	Homework forgotten	–2	FALSE
Byron	Good effort in class	1	TRUE
Grahame	100% in a test	2	FALSE
Marian	Bullying	–3	TRUE

A single record from this database table is read into a program that uses an array with the identifier studentdata. An example of this array is shown below:

```
studentdata = ["Kirstie", "Homework forgotten", "-2", "FALSE"]
```

The array is zero based, so `studentdata[0]` holds the value "Kirstie".

Question:

Write an algorithm that will identify whether the data in the studentdata array shows that a letter has been sent home or not for the student. The algorithm should then output either "sent" (if a letter has been sent) or "not sent" (if a letter has not been sent).

Answer:

[4 marks]

Question:

The database table Results stores the results for each student in each of their chosen subjects.

StudentName	Subject	Grade
Alistair	English	3
Jaxon	Art	5
Alex	Art	4
Anna	French	7
Ismaael	Art	9

Complete the SQL query to return all of the fields for the students who take Art.

Answer:

```
SELECT
FROM
WHERE
```

[3 marks]

WEEK 6: Exam Question review and improvement (Classwork)

OCR High School uses a computer system to store data about students' conduct. The system records good conduct as a positive number and poor conduct as a negative number. A TRUE or FALSE value is also used to record whether or not a letter has been sent home about each incident.

An example of the data held in this system is shown below

StudentName	Detail	Points	LetterSent
Kirstie	Homework forgotten	−2	FALSE
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A single record from this database table is read into a program that uses an array with the identifier studentdata. An example of this array is shown below:

```
studentdata = ["Kirstie", "Homework forgotten", "-2", "FALSE"]
```

The array is zero based, so `studentdata[0]` holds the value "Kirstie".

Question:

Write an algorithm that will identify whether the data in the studentdata array shows that a letter has been sent home or not for the student. The algorithm should then output either "sent" (if a letter has been sent) or "not sent" (if a letter has not been sent).

Answer:

[4 marks]

Question:

The database table Results stores the results for each student in each of their chosen subjects.

StudentName	Subject	Grade
Alistair	English	3
Jaxon	Art	5
Alex	Art	4
Anna	French	7
Ismaael	Art	9

Complete the SQL query to return all of the fields for the students who take Art.

Answer:

```
SELECT
_____
FROM
_____
WHERE
_____
```

WEEK 7: Cornell Notes (Homework task 1)

Date 26 / 02 / 24	**Topic:** 2.2 The use of arrays	ClearRevise Pages 68 and 69

Go to the OCR GCSE (J277) Videos Page and make notes on the following videos:

2.2 The use of arrays

Questions

Notes

Summary

WEEK 7: Exam Question (Homework task 2)

Question:

The following names of students are stored in an array with the identifier studentnames.

```
studentnames = ["Rob", "Anna", "Huw", "Emma", "Patrice", "Iqbal"]
```

A school uses the array to call an attendance register every morning.

Write an algorithm using iteration to:

- display the name of each student one at a time from `studentnames`
- take as input whether that student is present or absent
- display the total number of present students and number of absent students in a suitable message, after all student names have been displayed.

Answer:

[6 marks]

WEEK 7: Exam Question review and improvement (Classwork)

Question:

The following names of students are stored in an array with the identifier studentnames.

```
studentnames = ["Rob", "Anna", "Huw", "Emma", "Patrice", "Iqbal"]
```

A school uses the array to call an attendance register every morning.

Write an algorithm using iteration to:

- display the name of each student one at a time from `studentnames`
- take as input whether that student is present or absent
- display the total number of present students and number of absent students in a suitable message, after all student names have been displayed.

Answer:

[6 marks]

WEEK 10: Cornell Notes (Homework task 1)

Date 04 / 03 / 24	**Topic:** 2.2 How to use subprograms 2.2 Random number generation	ClearRevise Pages 73 and 74

Go to the OCR GCSE (J277) Videos Page and make notes on the following videos:

2.2 How to use subprograms

2.2 Random number generation

Questions

Notes

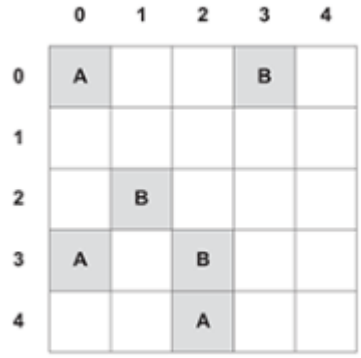
Summary

WEEK 10: Exam Question (Homework task 2)

Question:

OCRBlocks is a game played on a 5 × 5 grid. Players take it in turns to place blocks on the board.

The board is stored as a two-dimensional (2D) array with the identifier `gamegrid`. The diagram below shows that players A and B have placed three blocks each so far.



The function checkblock() checks whether a square on the board has been filled. When checkblock(4,2) is called, the value "A" is returned.

```
function checkblock(r,c)
  if gamegrid[r,c] == "A" or gamegrid[r,c] == "B" then
    outcome = gamegrid[r,c]
  else
    outcome = "FREE"
  endif
  return outcome
endfunction
```

Give the returned value when the following statements are called.

Answer:

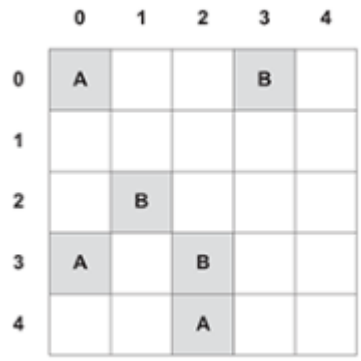
Function call	**Returned value**
`checkblock(2,1)`	**B**
`checkblock(3,0)`	**A**
`checkblock(2,3)`	**FREE**

[3 marks]

WEEK 10: Exam Question review and improvement (Classwork)

Question:

OCRBlocks is a game played on a 5 × 5 grid. Players take it in turns to place blocks on the board.
The board is stored as a two-dimensional (2D) array with the identifier `gamegrid`. The diagram below shows that players A and B have placed three blocks each so far.



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    outcome = gamegrid[r,c]
  else
    outcome = "FREE"
  endif
  return outcome
endfunction
```

Give the returned value when the following statements are called.

Answer:

Function call	**Returned value**
`checkblock(2,1)`	**B**
`checkblock(3,0)`	**A**
`checkblock(2,3)`	**FREE**

[3 marks]

WEEK 11: Cornell Notes (Homework task 1)

Date 25 / 03 / 24	**Topic:** 2.3 Defensive design considerations 1 and 2	ClearRevise Pages 78 and 79

Go to the OCR GCSE (J277) Videos Page and make notes on the following videos:

2.3 Defensive design considerations 1 and 2 (both videos)

Questions

Notes

Summary

WEEK 11: Exam Question (Homework task 2)

Question:

Elliott plays football for OCR FC. He wants to create a program to store the results of each football match they play and the names of the goal scorers. Elliott wants individual players from the team to be able to submit this information.

Describe two examples of defensive design that should be considered when developing this program.

Example 1:

Example 2:

[4 marks]

WEEK 11: Exam Question review and improvement (Classwork)

Question:

Elliott plays football for OCR FC. He wants to create a program to store the results of each football match they play and the names of the goal scorers. Elliott wants individual players from the team to be able to submit this information.

Describe two examples of defensive design that should be considered when developing this program.

Example 1:

Example 2:

[4 marks]

Aspire ACHIEVE Thrive

Develop your character

STOKE DAMEREL

Aspire | Achieve | Thrive