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A- LEVEL COMPUTER SCIENCE

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Could you convert this pseudocode into actual code?

```
PlayerOneScore = 0
PlayerTwoScore = 0
OUTPUT "How many games?"
INPUT NoOfGamesInMatch
FOR NoOfGamesPlayed = 1 TO NoOfGamesInMatch Do
   OUTPUT "Did Player One win the game (enter Y or N)?"
   INPUT PlayerOneWinsGame
   IF PlayerOneWinsGame = 'Y'
      THEN PlayerOneScore = PlayerOneScore + 1
      ELSE PlayerTwoScore = PlayerTwoScore + 1
   ENDIF
ENDFOR
OUTPUT PlayerOneScore
OUTPUT PlayerTwoScore
```

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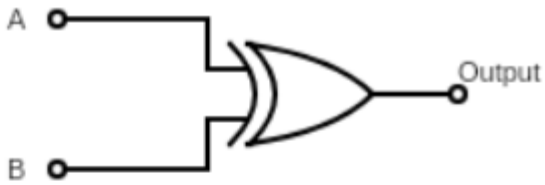
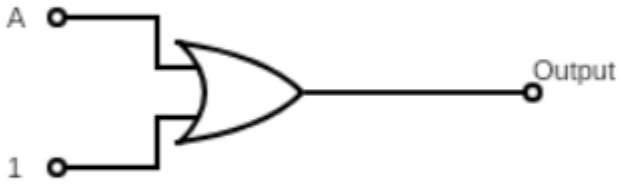
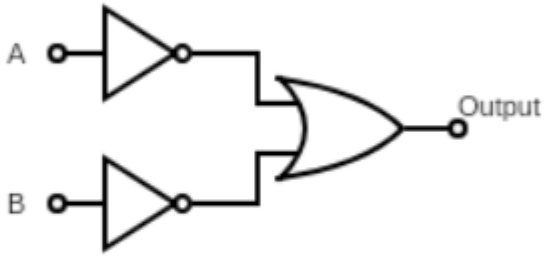
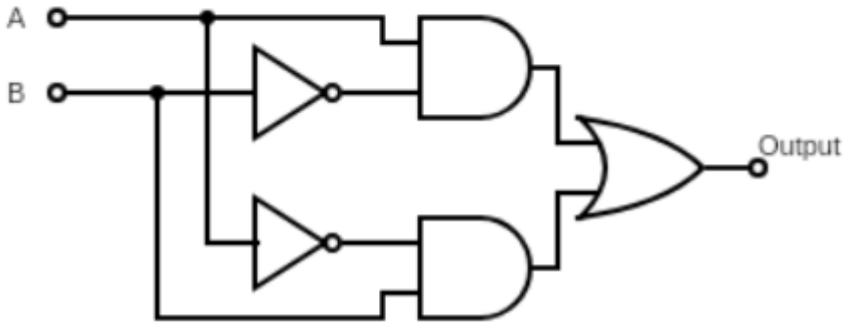
Can you match the equivalent logic circuits?









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What does i do in this code?

```
private static void ReceiveMorseCode(int[] Dash, char[] Letter, int[] Dot)
{
  string PlainText = EMPTYSTRING;
  string MorseCodeString = EMPTYSTRING;
  string Transmission = EMPTYSTRING;
  string CodedLetter = EMPTYSTRING;
  char PlainTextLetter = SPACE;
  Transmission = GetTransmission();
  int LastChar = Transmission.Length - 1;
  int i = 0;
  while (i < LastChar)
  {
    CodedLetter = GetNextLetter(ref i, Transmission);
    MorseCodeString = MorseCodeString + SPACE + CodedLetter;
    PlainTextLetter = Decode(CodedLetter, Dash, Letter, Dot);
    PlainText = PlainText + PlainTextLetter;
  }
  Console.WriteLine(MorseCodeString);
  Console.WriteLine(PlainText);
}
```

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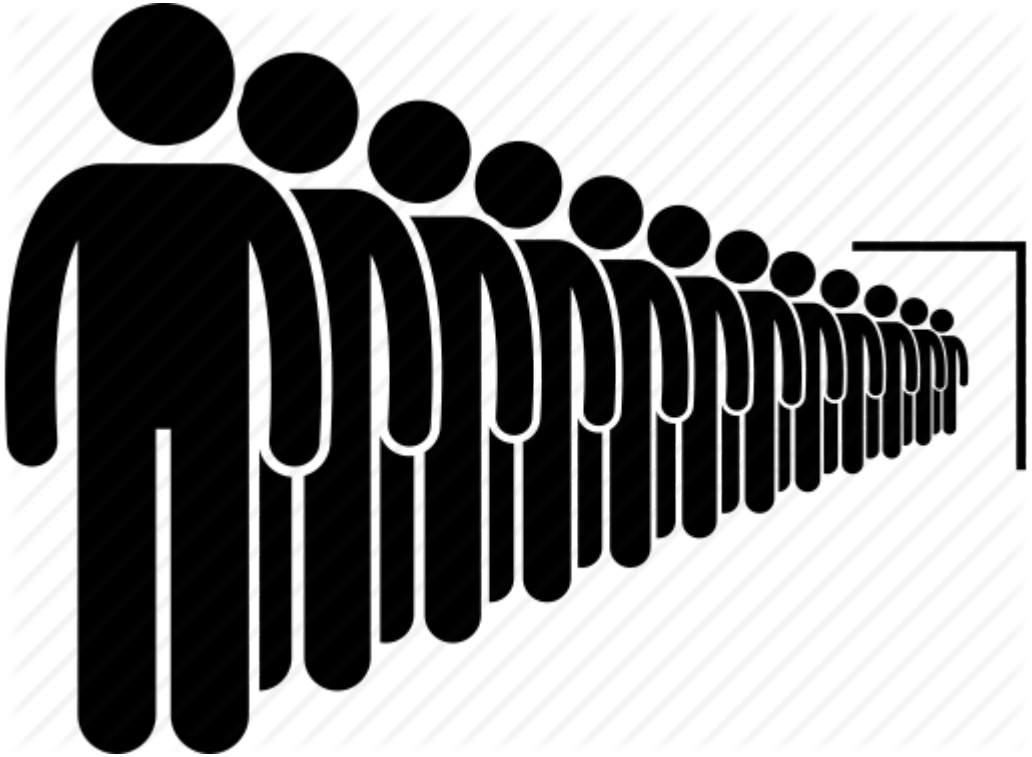
What is the difference between a Stack and a Queue?



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A team of programmers develop software to control a fleet of driverless cars, providing a taxi service for clients in a large city. What Legal and Ethical issues might the programmers face should the public use this service?

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So what's the point?

- The ability to break problems down and solve them in a systematic way is an important skill in many subject, and in real life, for when you are presented with challenges
- This skill is invaluable in many careers in the field of Computer Science, from Software Design & Development and Database Administration to Project and Team Management
- With the still increasing presence of computing in the day to day world, even if you don't pursue a career in computing you will probably work with someone who has and it is useful to know what those people are talking about!

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The A level – 2 year course

Paper 1 – Skeleton Program (40%)

150 Minute Exam – Summer of Year 13

Paper 2 – Theory of Computing (40%)

150 Minute Exam – Summer of Year 13

Coursework – Personal Project (20%)

Starts Easter of Year 12, finishes Easter of Year 13

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Paper 1 – Skeleton Program

- You will study:
  - Problem Solving
  - Object Oriented Programming
  - Regular Languages
  - Vectors
  - Data Structures
  - Algorithms
  - Analysis and Modification of Existing Programs
- You will take this exam on a computer and will need to write, modify and test code as well as answer questions on adjacent topics.

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Paper 2 – Theory of Computing

- You will study:
  - Computer Architecture
  - Logic Circuits & Boolean Algebra
  - Functional Programming
  - Legal and Ethical Issues
  - Networks
  - The Internet
  - Databases
  - Big Data
- You will take this exam on paper and will need to answer questions on the above topics.

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Coursework – Personal Project

- Program something of interest to you.
- In recent years we've had:
  - Video Games
  - Machine Learning
  - Procedurally Generated Landscapes
  - Satellite Simulators
  - Mobile Apps
  - Tools for other hobbies

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What do we expect from you?

- As with any A Level, you will need to show commitment and a strong willingness to work hard. Aside from that, you will need to have
  - a logical and analytical mind
  - the ability to meet deadlines
  - an interest in how computers work
  - a desire to make computers do what you want

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Where can it take you?

Computer Science is a highly regarded subject that will help you in any academic setting or with any career that requires an academic background. More specifically Computer Science has strong ties to:

- Aeronautical Engineering
- Biochemistry
- Biology
- Chemical Engineering
- Economics
- Chemistry
- Civil Engineering
- Electrical Engineering
- Geology
- Mechanical Engineering
- Materials Science
- Physics
- Pharmacy
- Psychology

Typical Extra Curricular Opportunities

- Visit Bletchley Park – See where it all began with a visit to Bletchley Park
- Mission Space Lab – Conduct an experiment aboard the International Space Station
- The British Informatics Olympiad – Pit your Computer Science skills against other computer science students across all of Britain in this prestigious event.
- RU Hacking – We keep our eyes open for Hackathons, programming events, run by the University of Reading
- Computer Science in Action – See what the experts in computer science are working on

BLETCHLEYPARK

British Informatics Olympiad

ttp | Computer Science in ACTION

Combinations…

Computer Science complements many other subjects at A-Level.

Our current Computer Science students are also studying...