

Programming Lab Exam revision

Question 1a

a = 8;

b = 5;

c = 0;

c = a;

a = b;

b = c;

a	b	c
8	5	0
5	8	8

The value in a is

5

the value in b is

8

the value in c is

8

Question 2a

In one sentence describe the purpose of the following code; assume the variables have all been declared as integers with integer values.

```
num1 = 10; num2 = 2; num3 = 8;
```

```
if (num1 < num2)
```

```
{
```

Code to swap the values in num1 and num2 goes here

```
}
```

```
if (num2 < num3)
```

```
{
```

Code to swap the values in num2 and num3 goes here

```
}
```

```
if (num1 < num2)
```

```
{
```

Code to swap the values in num1 and num2 goes here

```
}
```

n1	n2	n3
10	2	8
	8	2

Sorts the numbers
in descending order.

Question 3a

What does the following code produce?

```
for(int i=0;i<=2;i++)
{
    for(int j=0;j<=i;j++)
    {
        Console.WriteLine("");
    }
    Console.WriteLine();
}
```

a) ***

b) *
**

c) *
*
*

```

      0 1
      0 1
      0 1 2
      0 1 2 3
      *
      * *
      * * *
```

Question 4a

What are the values in each variable after the following code has run:

```
int num1 = 6;
int num2 = 2;
int num3 = 10;
int num4 = 3;
int temp = 0;
```

num1	num2	num3	num4	temp
6	2	10	3	0
3			6	6
	10	2		2

```
temp = num1;
num1 = num4;
num4 = temp;
temp = num2;
num2 = num3;
num3 = temp;
```

The value in num1 is 3 the value in num2 is 10 the value in num3 is 2
the value in num4 is 6 the value in temp is 2.

Question 5a.

What is the purpose or outcome of the following piece of code?

$n1 = 2$ $n2 = 5$

`num1 = num2 + num1;`

`num2 = num1 - num2`

`num1 = num1 - num2`

$n1$	$n2$
7	2
5	

To swap the values of two variables.

Question 6a.

In one sentence describe the purpose of the following three lines of code:

`temp = num1;`

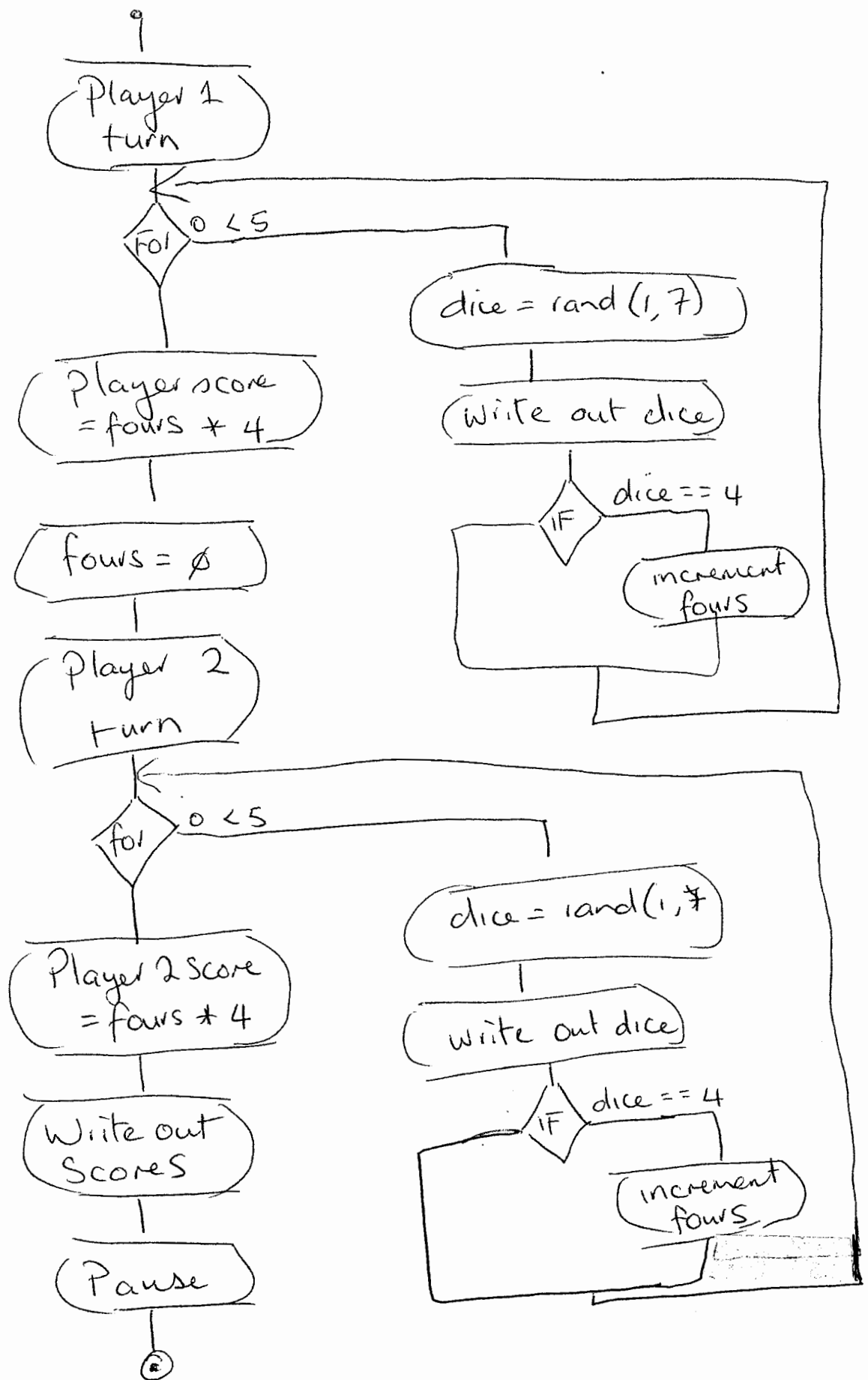
`num1 = num2;`

`num2 = temp;`

To swap the value of two variables.

7. Yahtzee- Fours: A player throws 5 dice, their score in the Fours category is 4 times the amount of fours they throw. So for a throw of 6,5,4,3,4, they get 8 points. Then a second player has a turn. Draw an activity diagram for the code below.

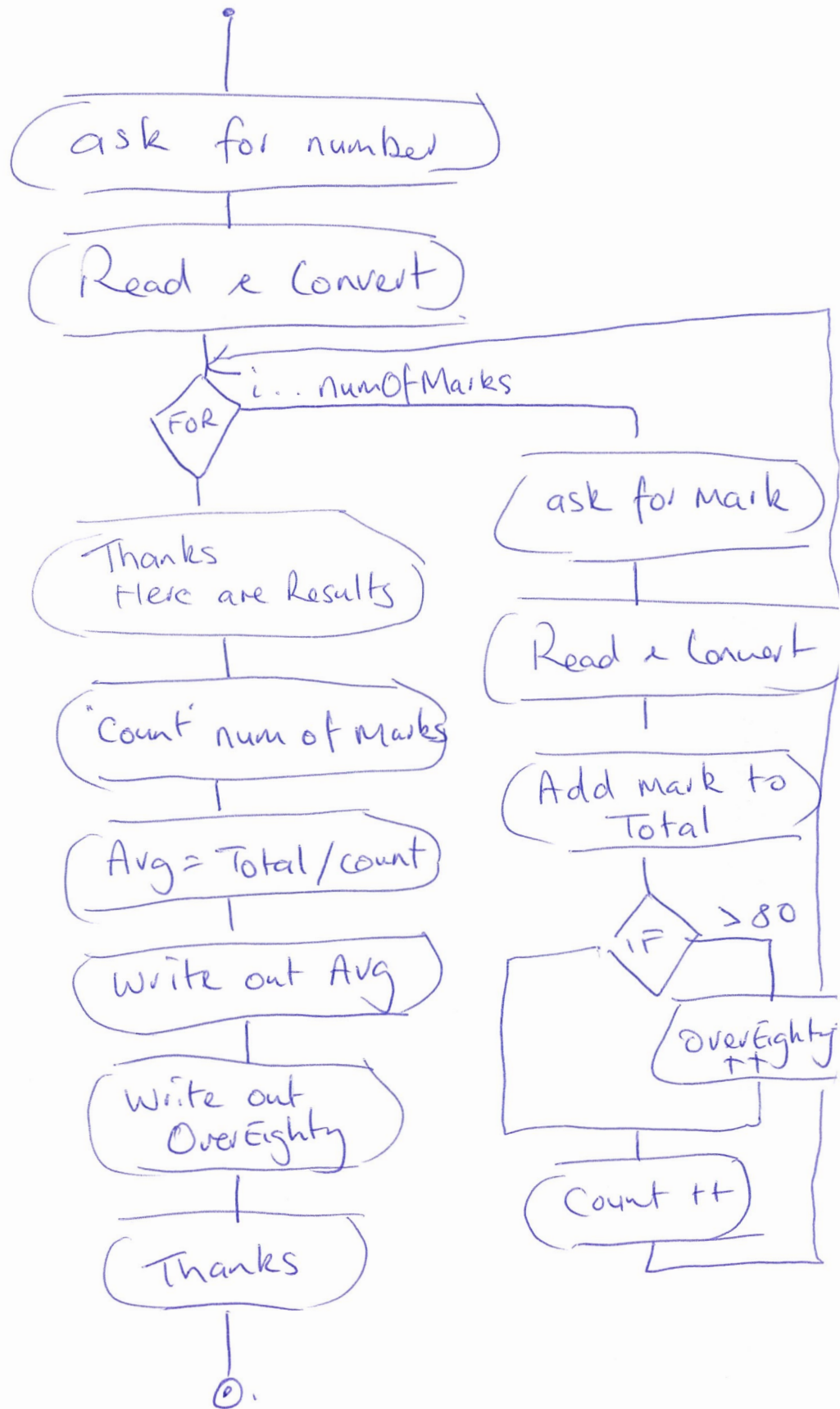
```
static void Main()
{
    int Player1Score = 0, Player2Score = 0, fours = 0, dice = 0;
    Random rand = new Random();
    Console.WriteLine("Player One's turn");
    for (int i = 0; i < 5; i++)
    {
        dice = rand.Next(1, 7);
        Console.WriteLine(dice);
        if (dice == 4)
        {
            fours++;
        }
    }
    Player1Score = fours * 4;
    //resetting variable
    Console.WriteLine("Player Two's turn");
    fours = 0;
    for (int i = 0; i < 5; i++)
    {
        dice = rand.Next(1, 7);
        Console.WriteLine(dice);
        if (dice == 4)
        {
            fours++;
        }
    }
    Player2Score = fours * 4;
    Console.WriteLine("Player 1 scored {0}, Player 2 scored {1}", Player1Score,
Player2Score);
    Console.ReadLine();
}
```



8. Draw a diagram to plan a program that reads in a number of exam marks, the users tells the program how many marks there are. The program keeps a count of how many marks were over 80 and adds all the marks together to work out the average for that set.

For example, your program output would look something like this:

```
Exam Program
How many marks are you going to enter?
3
Please enter the marks, one per line
40
81
60
Thank you, here are the class results:
Number of marks: 3
Average mark: 60.33
Number of marks over 80: 1
Thank you for running the marks program
```

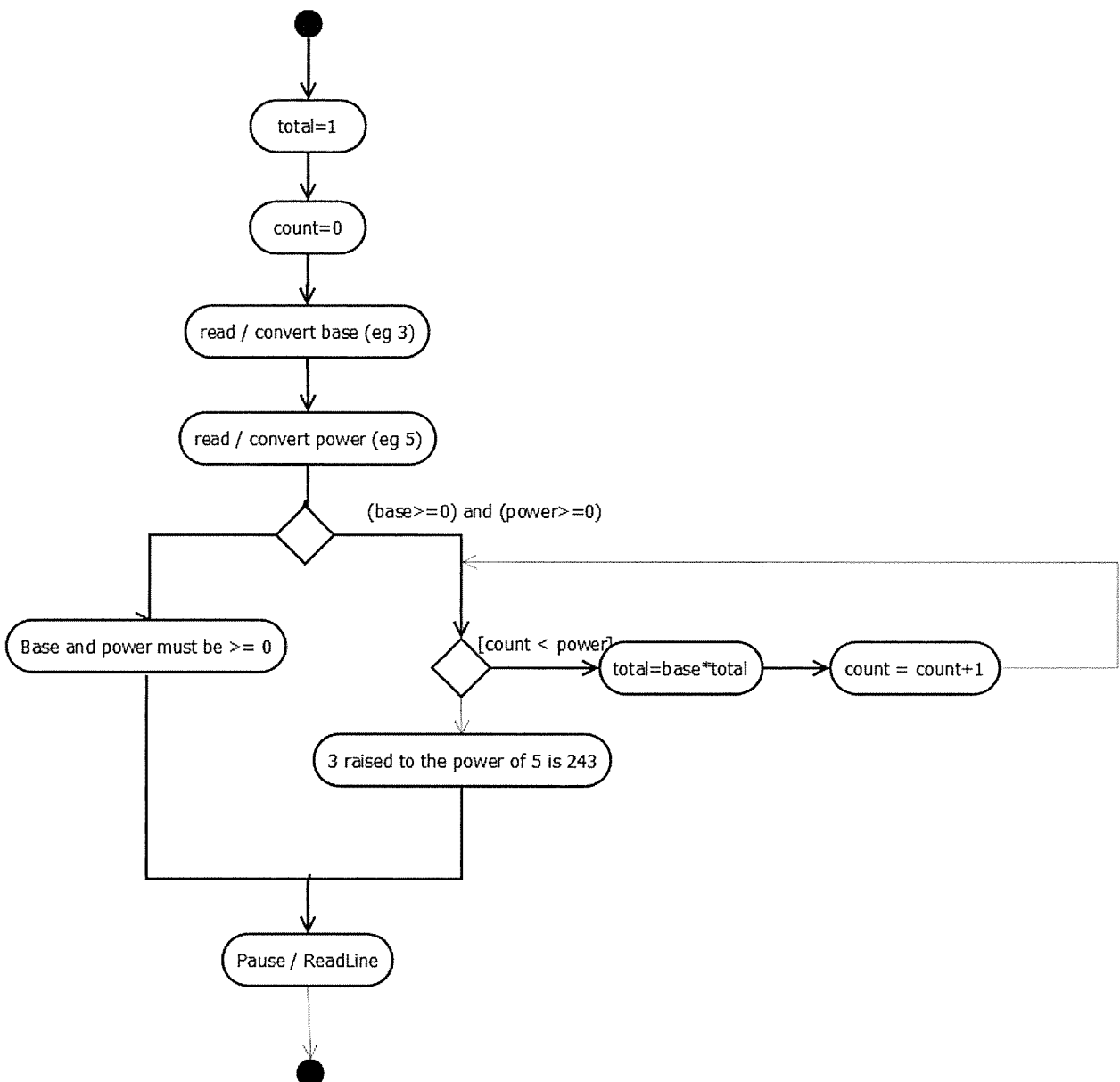


9. Number Powers

Write out the code for a program that works out the powers of numbers using the diagram below as a guide. The user is asked for the base number and the power.

For example, for base 3 and power 5: $3^5 = 3*3*3*3*3 = 243$

For base 2 and power 3: $2^3 = 2*2*2 = 8$




```
using System;
```

```
namespace NumberPowers
```

```
{
```

```
    class Program
```

```
    {
```

```
        static void Main(string[] args)
```

```
        {
```

```
            int total = 1, count = 0, base, power;
```

```
            Console.WriteLine("Please enter base");
```

```
            base = Convert.ToInt32(Console.ReadLine());
```

```
            Console.WriteLine("Please enter Power");
```

```
            power = Convert.ToInt32(Console.ReadLine());
```

```
            if (base >= 0 && (power >= 0))
```

```
            {
```

```
                while(count < power)
```

```
                {
```

```
                    total = base * total;
```

```
                    count = count + 1;
```

```
                }
```

```
                Console.WriteLine("{0} raised to the power of {1} is  
{2}", base, power, total);
```

```
            }
```

```
            else
```

```
            {
```

```
                Console.WriteLine("Base & Power must be >= 0");
```

```
            }
```

```
            Console.ReadLine();
```

```
        }
```

```
    }
```

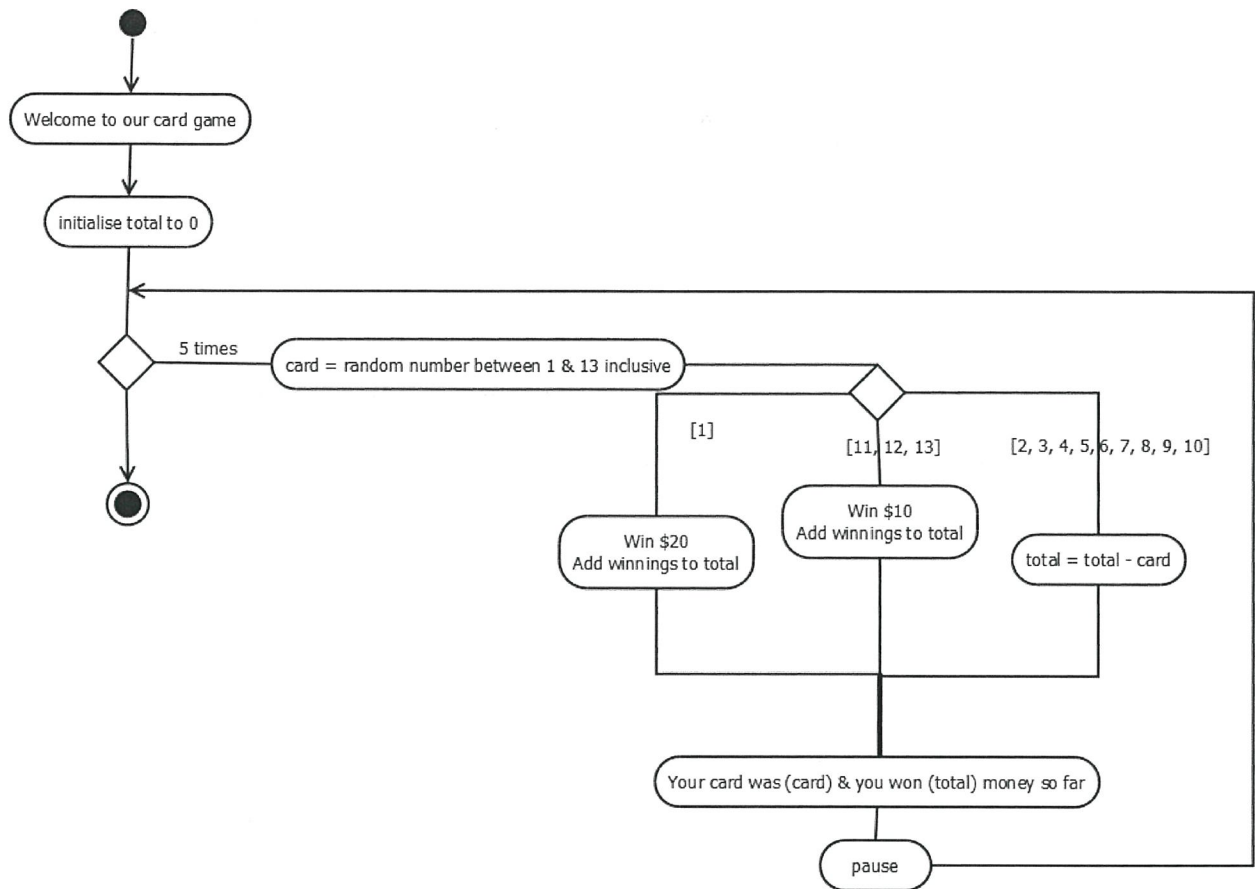
```
}
```

10. Explain in one sentence the main purpose of this code. What do you think it's doing? Do not explain the code line by line.

```
static void Main(string[] args)
{
    string temp;
    int check = 0;
    int number;
    Console.WriteLine("Please enter a number, enter stop to finish");
    temp = Console.ReadLine();
    while (temp != "stop")
    {
        number = Convert.ToInt32(temp);
        if (number % 2 == 0)
        {
            check = check + 1;
        }
        Console.WriteLine("Please enter a number, enter stop to finish");
        temp = Console.ReadLine();
    }
    Console.WriteLine("Check = " + check);
    Console.ReadLine();
}
```

Takes a count of the number of even numbers entered by a user.

11. Explain in plain English the main purpose of this diagram. What do you think it's doing? Do not explain the code line by line.



A card game. User is dealt five cards.
If the card is an ace they win \$20
If the card is a jack, queen or king
they win \$10.
If the card is 2-10 they lose the value
of the card.
Keeps track of users total winnings.

