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ENGG1111 – Quiz
2017/2018
Part B (8 marks)

Do not use any functions from the C++ standard library to write your function definitions

B1 (1 mark)

In the following program, write a definition of the *invert()* function such that the program outputs the reverse of the input supplied by the user. This is demonstrated in the following sample runs. In each sample, the first line of characters is user input and the second line is program output:

```
edit
tide
```

```
stab
bats
```

```
#include <iostream>

//  Write your function definition here









int main()
{
  char a, b, c, d;
  std::cin >> a >> b >> c >> d;

  invert(a, b, c, d);

  std::cout << a << b << c << d << std::endl;
  return 0;
}
```

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B2 (3 marks)

A perfect cube is the cube of an integer. For example, 1 (1*1*1), 125 (5*5*5), and 512 (8*8*8) are all perfect cubes, whereas 2, 100, and 333 are not.

Write a function, *is_cube()*, that determines if a positive integer passed as an argument is a perfect cube. Write your function to complete the following program that reads an integer supplied by the user and reports whether or not it is a perfect cube. You may assume that the user enters only values in {1, 2, ..., 10000000}. Sample runs:

```
343
Yes, it is a perfect cube
```

```
333
No, it is not a perfect cube
```

```
#include <iostream>

//  Write your function definition here









int main()
{
  int n;
  std::cin >> n;

  if (is_cube(n))
  {
    std::cout << "Yes, it is a perfect cube" << std::endl;
  }
  else
  {
    std::cout << "No, it is not a perfect cube" << std::endl;
  }
  return 0;
}
```

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B3 (4 marks)

Write a function, *second_largest()*, that, given a positive integer argument containing at least two different digits, will return the second largest digit while ignoring multiple occurrences. Some examples will make this clear:

- in the integer 434422240, the second largest digit is 3.
- in the integer 111111110, the second largest digit is 0.

Write your function to complete the following program that reads an integer supplied by the user and displays its second largest digit. You may assume that the user enters only integers in the interval [10, 1000000000] that contain at least two different digits. Sample runs:

```
122333455
Second largest digit: 4
```

```
42
Second largest digit: 2
```

```
#include <iostream>

//  Write your function definition here









int main()
{
  int n;
  std::cin >> n;

  std::cout << "Second largest digit: " << second_largest(n) << std::endl;
  return 0;
}
```

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