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Contents

| | | |
|----------|-------------------------------|----------|
| 1 | Introduction | 3 |
| 1.1 | Aims and Objectives | 3 |
| 2 | Guess What | 4 |
| 3 | The Simpsons | 5 |
| 4 | References | 6 |
| 5 | Appendix | 6 |
| 5.1 | Appendix A | 6 |
| 5.2 | Appendix B | 6 |
| 5.3 | Appendix C | 7 |

List of Figures

| | | |
|---|----------------------|---|
| 1 | You Looked | 4 |
| 2 | Simpsons | 5 |

List of Tables

| | | |
|---|------------------------------|---|
| 1 | Nomenclature Table | 2 |
| 2 | Binary Table | 3 |

| Symbol | Definition | Unit |
|---------|------------------------------------|----------------------|
| V | Velocity | [m/s] |
| ρ | Density | [kg/m ³] |
| Re | Reynolds Number | |
| u | velocity | [m/s] |
| L^* | Characteristic Length | [m] |
| μ | Dynamic Viscosity | [Pa/s] |
| Pr | Prandtl Number | |
| C_p | Specific Heat Capacity | [J/kg K] |
| k | Thermal Conductivity | [W/m k] |
| Nu | Nusselt number | |
| h | Heat transfer coefficient | [W/m k] |
| μ_o | Dynamic viscosity of bulk fluid | [Pa/s] |
| μ_b | Dynamic viscosity at the wall | [Pa/s] |
| L | Length of heating section | [m] |
| E_c | Energy of the cold stream | [j] |
| E_h | Energy of the hot stream | [j] |
| η | Energy efficiency | [%] |
| U_o | Overall heat transfer coefficient | [W/m k] |
| h_i | Internal heat transfer coefficient | [W/m k] |
| h_o | External heat transfer coefficient | [W/m k] |
| k_w | External heat transfer coefficient | [W/m k] |
| t_c | Temperature of the cold | [°C] |
| t_h | Temperature of the hot | [°C] |
| D | Diameter | [m] |
| A | Area | [m ²] |
| Q | Heat transferred | [j] |
| F | Friction factor | [-] |
| g | Gravity | [m s ⁻²] |

Table 1: Nomenclature Table

1 Introduction

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

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Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam. Aliquam pellentesque, augue quis sagittis posuere, turpis lacus congue quam, in hendrerit risus eros eget felis. Maecenas eget erat in sapien mattis porttitor. Vestibulum porttitor. Nulla facilisi. Sed a turpis eu lacus commodo facilisis. Morbi fringilla, wisi in dignissim interdum, justo lectus sagittis dui, et vehicula libero dui cursus dui. Mauris tempor ligula sed lacus. Duis cursus enim ut augue. Cras ac magna. Cras nulla. Nulla egestas. Curabitur a leo. Quisque egestas wisi eget nunc. Nam feugiat lacus vel est. Curabitur consectetur.

$$E = m * c^2 \quad (1)$$

1.1 Aims and Objectives

- ,dkjmjs
- hiqjdkeco
- knma

A binary number is a number expressed in the base-2 numeral system or binary numeral system, a method of mathematical expression which uses only two symbols: typically "0" and "1". The base-2 numeral system is a positional notation with a radix of 2. Each digit is referred to as a bit, or binary digit.

Table 2: Binary Table

| | | | | |
|---|---|---|---|---|
| 0 | 1 | 0 | 1 | 0 |
| 1 | 0 | 1 | 0 | 1 |
| 0 | 1 | 0 | 1 | 0 |
| 1 | 0 | 1 | 0 | 1 |

Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.

Sed commodo posuere pede. Mauris ut est. Ut quis purus. Sed ac odio. Sed vehicula hendrerit sem. Duis non odio. Morbi ut dui. Sed accumsan risus eget odio. In hac habitasse platea dictumst. Pellentesque non elit. Fusce sed justo eu urna porta tincidunt. Mauris felis odio, sollicitudin sed, volutpat a, ornare ac, erat. Morbi quis dolor. Donec pellentesque, erat ac sagittis semper, nunc dui lobortis purus, quis congue purus metus ultricies tellus. Proin et quam. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Praesent sapien turpis, fermentum vel, eleifend faucibus, vehicula eu, lacus.

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Donec odio elit, dictum in, hendrerit sit amet, egestas sed, leo. Praesent feugiat sapien aliquet odio. Integer vitae justo. Aliquam vestibulum fringilla lorem. Sed neque lectus, consectetur at, consectetur sed, eleifend ac, lectus. Nulla facilisi. Pellentesque eget lectus. Proin eu metus. Sed porttitor. In hac habitasse platea dictumst. Suspendisse eu lectus. Ut mi mi, lacinia sit amet, placerat et, mollis vitae, dui. Sed ante tellus, tristique ut, iaculis eu, malesuada ac, dui. Mauris nibh leo, facilisis non, adipiscing quis, ultrices a, dui.

Morbi luctus, wisi viverra faucibus pretium, nibh est placerat odio, nec commodo wisi enim eget quam. Quisque libero justo, consectetur a, feugiat vitae, porttitor eu, libero. Suspendisse sed mauris vitae elit sollicitudin malesuada. Maecenas ultricies eros sit amet ante. Ut venenatis velit. Maecenas sed mi eget dui varius euismod. Phasellus aliquet volutpat odio. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Pellentesque sit amet pede ac sem eleifend consectetur. Nullam elementum, urna vel imperdiet sodales, elit ipsum pharetra ligula, ac pretium ante justo a nulla. Curabitur tristique arcu eu metus. Vestibulum lectus. Proin mauris. Proin eu nunc eu urna hendrerit faucibus. Aliquam auctor, pede consequat laoreet varius, eros tellus scelerisque quam, pellentesque hendrerit ipsum dolor sed augue. Nulla nec lacus.

Suspendisse vitae elit. Aliquam arcu neque, ornare in, ullamcorper quis, commodo eu, libero. Fusce sagittis erat at erat tristique mollis. Maecenas sapien libero, molestie et, lobortis in, sodales eget, dui. Morbi ultrices rutrum lorem. Nam elementum ullamcorper leo. Morbi dui. Aliquam sagittis. Nunc placerat. Pellentesque tristique sodales est. Maecenas imperdiet lacinia velit. Cras non urna. Morbi eros pede, suscipit ac, varius vel, egestas non, eros. Praesent malesuada, diam id pretium elementum, eros sem dictum tortor, vel consectetur odio sem sed wisi.

2 Guess What



Figure 1: You Looked

We're no strangers to love
You know the rules and so do I (do I),
A full commitment's what I'm thinking of
You wouldn't get this from any other guy
I just wanna tell you how I'm feeling
Gotta make you understand
Never gonna give you up
Never gonna let you down
Never gonna run around and desert you
Never gonna make you cry
Never gonna say goodbye
Never gonna tell a lie and hurt you
We've known each other for so long
Your heart's been aching, but you're too shy to say it (say it)
Inside, we both know what's been going on (going on)
We know the game and we're gonna play it
And if you ask me how I'm feeling
Don't tell me you're too blind to see
Never gonna give you up
Never gonna let you down
Never gonna run around and desert you
Never gonna make you cry
Never gonna say goodbye
Never gonna tell a lie and hurt you
Never gonna give you up
Never gonna let you

down
Never gonna run around and desert you
Never gonna make you cry
Never gonna say goodbye
Never gonna tell a lie and hurt you
We've known each other for so long
Your heart's been aching, but you're too shy to say it (to say it)
Inside, we both know what's been going on (going on)
We know the game and we're gonna play it
I just wanna tell you how I'm feeling
Gotta make you understand
Never gonna give you up
Never gonna let you down
Never gonna run around and desert you
Never gonna make you cry
Never gonna say goodbye
Never gonna tell a lie and hurt you
Never gonna give you up
Never gonna let you down
Never gonna run around and desert you
Never gonna make you cry
Never gonna say goodbye
Never gonna tell a lie and hurt you [1]

3 The Simpsons

The TV Show

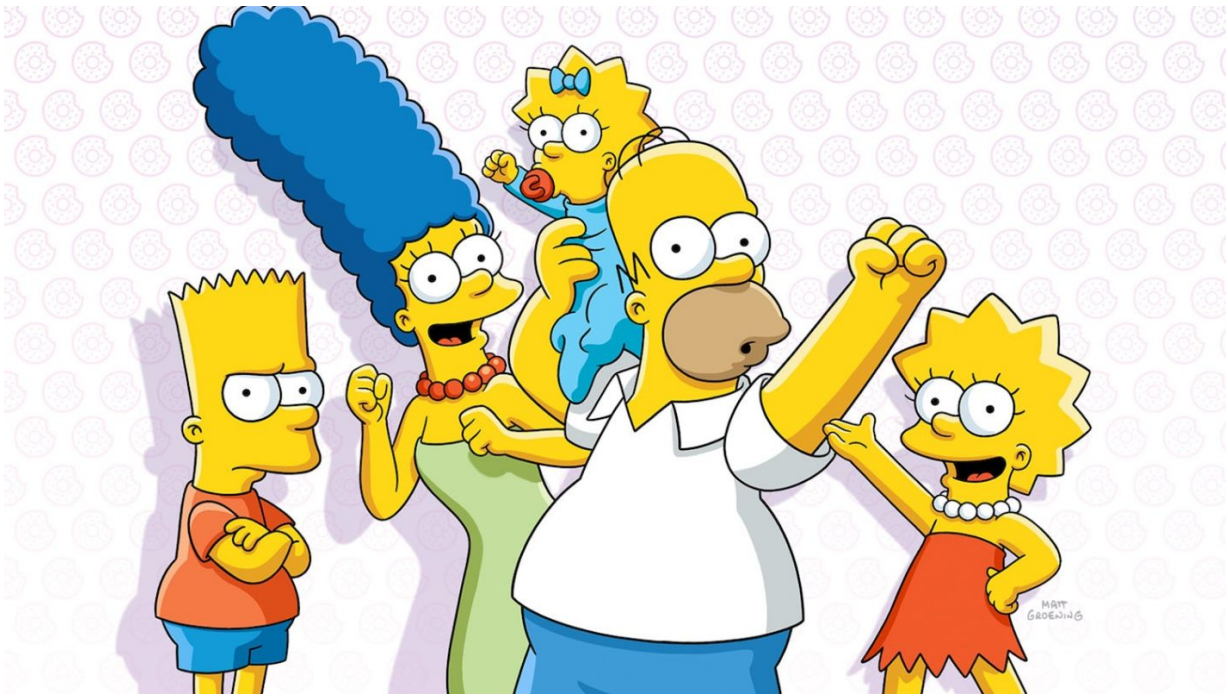


Figure 2: Simpsons

The Simpsons is an American animated sitcom created by Matt Groening for the Fox Broadcasting Company. The series is a satirical depiction of American life, epitomized by the Simpson family, which consists of Homer, Marge, Bart, Lisa, and Maggie. The show is set in the fictional town of Springfield and parodies American culture and society, television, and the human condition.

The family was conceived by Groening shortly before a solicitation for a series of animated shorts with producer James L. Brooks. He created a dysfunctional family and named the characters after his own family members, substituting Bart for his own name; he thought Simpson was a funny name in that it sounded similar to "simpleton". The shorts became a part of *The Tracey Ullman Show* on April 19, 1987. After three seasons, the sketch was developed into a half-hour prime time show and became Fox's first series to land in the Top 30 ratings in a season (1989–1990).

Since its debut on December 17, 1989, 728 episodes of the show have been broadcast. It is the longest-running American animated series, longest-running American sitcom, and the longest running American scripted prime time television series, both in terms of seasons and number of episodes. A feature-length film, *The Simpsons Movie*, was released in theaters worldwide on July 27, 2007, and grossed over \$527 million, with a sequel in development as of 2018. The series has also spawned numerous comic book series, video games, books, and other related media, as well as a billion-dollar merchandising industry. The Simpsons is a joint production by Gracie Films and 20th Television. On March 3, 2021, the series was announced to have been renewed for seasons 33 and 34, which were later confirmed to have 22 episodes each, increasing the episode count from 706 to 750. Its thirty-third season premiered on September 26, 2021.

The Simpsons received acclaim throughout its early seasons in the 1990s, which are generally considered its "golden age". Since then, it has been criticized for a perceived decline in quality. *Time* named it the 20th century's best television series, and Erik Adams of *The A.V. Club* named it "television's crowning achievement regardless of format". On January 14, 2000, the Simpson family was awarded a star on the Hollywood Walk of Fame. It has won dozens of awards since it debuted as a series, including 34 Primetime Emmy Awards, 34 Annie Awards, and 2 Peabody Awards. Homer's exclamatory catchphrase of "D'oh!" has been adopted into the English language, while *The Simpsons* has influenced many other later adult-oriented animated sitcom television series. [2]

4 References

- [1] Rick Astley et al. "Never Gonna Give You Up: Toward a Never Gonna Let You Down". In: ().
- [2] William Irwin, Mark T Conard, and Aeon J Skoble. *The Simpsons and philosophy: The d'oh! of Homer*. Read-HowYouWant. com, 2010.

5 Appendix

5.1 Appendix A

Item List:

- Item 1
- Item 2
- Item 3
- Item 4
- Item 5

5.2 Appendix B

```
%% Using MATLAB with Serial Devices (such as RS-232)
% MATLAB supports communication with serial devices including RS-232 when
% using the Instrument Control Toolbox. There are many devices with serial
% interfaces, including gas chromatometers, mass spectrometers,
% imaging devices, pulse oximeters, and instruments.
%
% The toolbox provides a graphical tool that allows you to configure,
% control, and acquire data from your serial device without writing code.
% The tool automatically generates MATLAB code that allows you to reuse
% your work. The code example below was automatically generated by the
% tool. Type "tmtool" at the MATLAB command line to launch this tool.
%
% This code example below shows you how you can communicate with your
% serial device using MATLAB. The "*IDN?" command was used which is a
% typical command for communicating with an instrument. The commands you
% can use will depend on what your serial device supports.
%% Automatically generating a report in MATLAB
% Press the "Save and Publish to HTML" button in the MATLAB Editor to
% execute this code example and automatically generate a report of your
% work with the serial device.
%% Automatically generating MATLAB script for your RS-232 device
% To automatically create your own MATLAB script, launch "tmtool". Open the
% "Hardware" node, open the "Serial" node, select your serial port (such
% as COM1, press the "connect" button. Once connected, enter your device
% commands in the right pane, press "Session log" to see the code generated,
% and press "Save Session" to save the code to a MATLAB (.m) file.
%% MATLAB script automatically generated for the RS-232 device
% The following MATLAB script was automatically generated by interacting
% with the device configuration tool provided by the toolbox.
% Creation time: 03-Oct-2006 20:36:43
% Create a serial port object.
obj1 = instrfind('Type', 'serial', 'Port', 'COM3', 'Tag', '');
% Create the serial port object if it does not exist
% otherwise use the object that was found.
if isempty(obj1)
    obj1 = serial('COM3');
else
    fclose(obj1);
    obj1 = obj1(1)
```

```
end
% Connect to instrument object, obj1.
fopen(obj1);
% Communicating with instrument object, obj1.
data1 = query(obj1, '*IDN?');
% Disconnect from instrument object, obj1.
fclose(obj1);
% Clean up all objects.
delete(obj1);
```

5.3 Appendix C

```
import unittest

class TestSum(unittest.TestCase):

    def test_sum(self):
        self.assertEqual(sum([1, 2, 3]), 6, "Should be 6")

    def test_sum_tuple(self):
        self.assertEqual(sum((1, 2, 2)), 6, "Should be 6")

if __name__ == '__main__':
    unittest.main()

$ python test_sum_unittest.py
.F
=====
FAIL: test_sum_tuple (__main__.TestSum)
-----
Traceback (most recent call last):
  File "test_sum_unittest.py", line 9, in test_sum_tuple
    self.assertEqual(sum((1, 2, 2)), 6, "Should be 6")
AssertionError: Should be 6

-----
Ran 2 tests in 0.001s

FAILED (failures=1)

$ pip install nose2
$ python -m nose2
.F
=====
FAIL: test_sum_tuple (__main__.TestSum)
-----
Traceback (most recent call last):
  File "test_sum_unittest.py", line 9, in test_sum_tuple
    self.assertEqual(sum((1, 2, 2)), 6, "Should be 6")
AssertionError: Should be 6

-----
Ran 2 tests in 0.001s

FAILED (failures=1)
```
