Polynomials of Smaller Mahler Measure and Their Newman Multiples

And also Custom Directives in Angular

Custom Directives in Angular

And also Polynomials, Mahler Measure, and Newman Multiples

Directives in Angular

- Components
  - Internal browser implementation mechanisms
  - The combined specification of the look, feel, and behavior of DOM elements

- Attribute Directives
  - Modify the appearance or behavior of an element, component, or another directive
  - *NgStyle*

- Structural Directives
  - Modify the DOM layout by adding and removing elements
  - NgFor, NgIf

A *Newman Polynomial* is a polynomial whose coefficients are in {0,1} and whose leading coefficient and constant term are both 1.

Custom Directives

- Create your own HTML element attributes
- Define specific behavior for DOM elements to take
- Effective way of implementing an event listener
- Uses *Dependency Injection*
- Can be either an attribute or structural

It makes sense that Newman polynomials should have no positive real roots. Furthermore, it's known that all roots of all Newman polynomials lie in the slit annulus:

$$A_\phi \setminus \mathbb{R}^+ = \{z \in \mathbb{C} : \phi^{-1} < |z| < \phi\} \setminus \mathbb{R}^+$$

Where phi denotes the golden ratio.

Creating a Custom Directive

- Naming the Directive (behaves like a CSS attribute)

```
<p appHighlight>Highlight me!</p>
```

Creating a Custom Directive

- Naming the Directive (behaves like a CSS attribute
- Writing the decorator

```
import { Directive } from '@angular/core';


@Directive({
  selector: '[appHighlight]'
})
export class HighlightDirective {

//add your function here
  constructor() { }
}
```

Creating a Custom Directive

- Naming the Directive (behaves like a CSS attribute)
- Writing the decorator
- Importing ElementRef, Input, HostListener, etc.

```
import { Directive, ElementRef } from '@angular/core';

@Directive({
  selector: '[appHighlight]'
})
export class HighlightDirective {
    constructor(el: ElementRef) {
       el.nativeElement.style.backgroundColor = 'yellow';
    }
}
```

Creating a Custom Directive

- Naming the Directive (behaves like a CSS attribute)
- Writing the decorator
- Importing ElementRef, Input, HostListener, etc.
- Adding to the module

```
import { Highlighter } from './app.component';
@NgModule({
 declarations: [
   AppComponent,
   Highlighter
 ],
...
```

Creating a Custom Directive

...or you could just do this:

```
ng generate directive highlight
```

Theorem 1.3. *Let $f(z) \in \mathbb{Z}[z]$ be monic and such that $f(z)$ has no roots on the unit circle $\mathscr{C}$. Suppose that $f(z)$ has no positive real roots and exactly two roots outside $\mathscr{C}$, both non-real and with multiplicity one. Suppose further that $\gcd(f(z), \widetilde{f}(z)) = 1$. For n a positive integer, define $h_n(z)$ as the largest degree monic factor of $f(z)z^n + \widetilde{f}(z)$ not divisible by a cyclotomic polynomial. Then the polynomials $h_n(z)$ include infinitely many distinct irreducible polynomials with distinct Mahler measures approaching the Mahler measure of $f(z)$ as n tends to infinity. Furthermore, these irreducible $h_n(z)$ have no positive real roots and each has exactly two roots outside $\mathscr{C}$. Also, if β is a root of $f(z)$ with $|\beta| > 1$ and if β is not a root of a Newman polynomial, then for n sufficiently large, no multiple of $h_n(z)$ in $\mathbb{Z}[z]$ is a Newman polynomial.*

We apologise for the fault in the subtitles. Those responsible have been sacked.

$$\mathscr{N}'(\beta,d)=\{F(\beta):F\in\mathscr{M}_0 \text{ and } \deg F(z)\leq d\}.$$

We apologise again for the fault in the subtitles. Those responsible for sacking the people who have just been sacked, have been sacked.