


## Problem 1

$$126 = 10^2 + 5^2 + 1^2$$

Na koliko se načina broj 126 može prikazati kao suma kvadrata različitih prirodnih brojeva?

cmsy10

	0	1	2	3	4	5	6	7
'00	— 0	· 1	× 2	* 3	÷ 4	◇ 5	± 6	∓ 7
'01	⊕ 8	⊖ 9	⊗ 10	⊘ 11	⊙ 12	◯ 13	○ 14	● 15
'02	⋈ 16	≡ 17	⊆ 18	⊇ 19	≤ 20	≥ 21	⋈ 22	⋈ 23
'03	≈ 24	≈ 25	⊂ 26	⊃ 27	⋈ 28	⋈ 29	⋈ 30	⋈ 31
'04	← 32	→ 33	↑ 34	↓ 35	↔ 36	↗ 37	↘ 38	↯ 39
'05	⇐ 40	⇒ 41	⇑ 42	⇓ 43	⇔ 44	↖ 45	↙ 46	∞ 47
'06	/ 48	∞ 49	∈ 50	∋ 51	△ 52	▽ 53	/ 54	† 55
'07	∀ 56	∃ 57	¬ 58	∅ 59	ℜ 60	ℑ 61	⊤ 62	⊥ 63
'10	ℵ <sub>64</sub>	ℳ <sub>65</sub>	ℳ <sub>66</sub>	ℳ <sub>67</sub>	ℳ <sub>68</sub>	ℳ <sub>69</sub>	ℳ <sub>70</sub>	ℳ <sub>71</sub>
'11	ℳ <sub>72</sub>	ℳ <sub>73</sub>	ℳ <sub>74</sub>	ℳ <sub>75</sub>	ℳ <sub>76</sub>	ℳ <sub>77</sub>	ℳ <sub>78</sub>	ℳ <sub>79</sub>
'12	ℳ <sub>80</sub>	ℳ <sub>81</sub>	ℳ <sub>82</sub>	ℳ <sub>83</sub>	ℳ <sub>84</sub>	ℳ <sub>85</sub>	ℳ <sub>86</sub>	ℳ <sub>87</sub>
'13	ℳ <sub>88</sub>	ℳ <sub>89</sub>	ℳ <sub>90</sub>	ℳ <sub>91</sub>	ℳ <sub>92</sub>	ℳ <sub>93</sub>	ℳ <sub>94</sub>	ℳ <sub>95</sub>
'14	⊢ 96	⊣ 97	⌊ 98	⌋ 99	⌈ 100	⌋ 101	{ 102	} 103
'15	⟨ 104	⟩ 105	 106	 107	↕ 108	↕ 109	\ 110	⌋ 111
'16	√ 112	∏ 113	∇ 114	∫ 115	⊔ 116	⊓ 117	⊆ 118	⊇ 119
'17	§ 120	† 121	‡ 122	♣ 123	♣ 124	◇ 125	♥ 126	♠ 127

25		126

$$126 = 11^2 + 5$$

$$126 = 11^2 + 2^2 + 1^2$$

$$126 = 10^2 + 26$$

$$26 = 5^2 + 1^2 = 4^2 + 10$$

$$10 = 3^2 + 1^2$$

$$126 = 10^2 + 5^2 + 1^2$$

$$126 = 10^2 + 4^2 + 3^2 + 1^2$$

$$126 = 9^2 + 45$$

$$45 = 6^2 + 3^2 = 5^2 + 20$$

$$20 = 4^2 + 2^2$$

$$126 = 9^2 + 6^2 + 3^2$$

$$126 = 9^2 + 5^2 + 4^2 + 2^2$$

$$126 = 8^2 + 62$$

$$62 = 7^2 + 13 = 7^2 + 3^2 + 2^2$$

$$62 = 6^2 + 26$$

$$26 = 5^2 + 1^1 = 4^2 + 3^2 + 1^2$$

3 prikaza

$$126 = 7^2 + 77$$

$$= 7^2 + 6^2 + 41$$

$$= 7^2 + 6^2 + 5^2 + 4^2$$



$$126 = 11^2 + 2^2 + 1^2$$

$$126 = 10^2 + 5^2 + 1^2$$

$$126 = 10^2 + 4^2 + 3^2 + 1^2$$

$$126 = 9^2 + 6^2 + 3^2$$

$$126 = 9^2 + 5^2 + 4^2 + 2^2$$

$$126 = 8^2 + 7^2 + 3^2 + 2^2$$

$$126 = 8^2 + 6^2 + 5^2 + 1^2$$

$$126 = 8^2 + 6^2 + 4^2 + 3^2 + 1^2$$

$$126 = 7^2 + 6^2 + 5^2 + 4^2$$

# Kvadratni brojevi

1 , 4, 9, 16, 25, 36, 49, 64, 81, 100, 121

# Prikaz broja 126

$$126 = 121 + 4 + 1$$

$$126 = 100 + 25 + 1$$

$$126 = 100 + 16 + 9 + 1$$

$$126 = 81 + 36 + 9$$

$$126 = 81 + 25 + 16 + 4$$

$$126 = 64 + 49 + 9 + 4$$

$$126 = 64 + 36 + 25 + 1$$

$$126 = 64 + 36 + 16 + 9 + 1$$

$$126 = 49 + 36 + 25 + 16$$

## Problem 2

Odredi tablicu rastava za sve brojeve od 1 do 1000.

- koji se brojevi mogu prikazati kao suma kvadrata različitih prirodnih brojeva?
- na koliko različitih načina je taj prikaz moguć?

Kreira se lista prikaza u koju ulaze samo oni brojevi koji taj prikaz posjeduju.

1 = 1

2 – nema prikaz

3 – nema prikaz

4 = 4

$$5 = 4 + 1$$

6 – nema prikaz

7 – nema prikaz

8 – nema prikaz

$$9 = 9$$

$$10 = 9 + 1$$

11 – nema prikaz

12 – nema prikaz

$$13 = 9 + 4$$

$$14 = 9 + 4 + 1$$

15 – nema prikaz

$$16 = 16$$

$$17 = 16 + 1$$

18 – nema prikaz

19 – nema prikaz

$$20 = 16 + 4$$

$$21 = 16 + 4 + 1$$

22 – nema prikaz

23 – nema prikaz



$$85 = 81 + 4 = 81 + 4$$

$$= 64 + 21 = 64 + 16 + 4 + 1$$

$$= 49 + 36 = 49 + 36$$

$$90 = 81 + 9 = 81 + 9$$

$$= 64 + 26 = 64 + 25 + 1$$

$$= 64 + 16 + 9 + 1$$

$$= 49 + 41 = 49 + 36 + 4 + 1$$

$$= 49 + 25 + 16$$

$$= 36 + 55 = 36 + 25 + 16 + 9 + 4$$

- 126 je najmanji sa 9 prikaza
- 128 nema nijedan prikaz
- svi veći od 128 imaju prikaz
- prvi s više prikaza (11) je 170
- 174 ima 13 prikaza
- 190 ima 14 prikaza
- 195 ima 16 prikaza
- 210 ima 18 prikaza

- Svi brojevi koji nemaju prikaz su
- 2, 3, 6, 7, 8, 11, 12, 15, 18, 19, 22, 23, 24, 27, 28, 31, 32, 33, 43, 44, 47, 48, 60, 67, 72, 76, 92, 96, 108, 112, 128

- 0: 2,3,6,7,8,11,12,15,18,19,22,23,24,27,28,31,32,33,43,44,47,48,60,67,72,76,92,96,108,112,128,
- 1: 1,4,5,9,10,13,14,16,17,20,21,34,35,36,37,38,39,40,42,51,52,55,56,57,58,59,
- 63,64,68,71,73,80,83,88,97,124,132,
- 2: 25,26,29,30,41,45,46,49,53,54,61,69,70,77,79,82,84,87,93,103,107,133,144,
- 148,188,
- 3: 50,62,66,75,81,85,86,89,91,95,98,99,100,102,104,109,113,116,118,119,123,136,137,
- 140,152,157,172,176,177,192,
- 4: 65,74,78,101,105,106,111,115,117,120,121,122,127,141,153,160,164,168,193,
- 5: 94,125,129,131,143,145,149,156,161,163,167,173,197,213,
- 6: 90,114,134,135,138,139,147,180,181,208,212,217,228,
- 7: 110,142,151,154,158,169,184,189,204,224,
- 8: 155,159,162,165,166,182,187,196,201,202,203,216,229,233,240,252,253,
- 9: 126,130,146,150,171,178,179,183,185,200,209,236,237,241,288,
- 10: 191,205,218,232,249,257,
- 11: 170,175,198,207,220,221,227,245,272,277,293,
- 12: 186,214,225,244,248,268,297,
- 13: 174,199,223,256,265,292,
- 14: 190,194,206,215,261,269,273,281,313,317,
- 15: 211,219,242,262,301,
- 16: 195,222,239,243,276,278,289,333,
- 17: 226,230,238,264,266,284,
- 18: 210,258,263,267,285,304,308,337,
- 19: 231,246,254,260,357,
- 20: 234,247,251,282,305,309,353,
- 21: 235,250,280,298,321,329,
- 22: 332,