| TF-IDF R1 | Method | Query ID | Recipe ID | Evaluator 1 | Evaluator 2 | Evaluator 3 | Evaluator 4 | Average Evaluator Score | Average Query Score | Average Difficulty Score | Average Method Score |
|--|--------|-----------------------|-----------|-------------------------|-------------------------|-------------|---------------|-------------------------|---------------------|--------------------------|----------------------|
| TF-IDF | | | | | | | | 1 | | | |
| TF-IDF | | | R2 | ~ | ✓ | | ~ | 1 | | | |
| F-IDF Easy Difficulty R5 | | | R3 | ~ | ✓ | ✓ | ~ | 1 | | | |
| R6 | TF-IDF | Q1 Fasy Difficulty | R4 | | | | | 0 | 0.7142857143 | | |
| TF-IDF R7 | | Lasy Difficulty | R5 | \checkmark | $\overline{\mathbf{V}}$ | | ✓ | 1 | | | |
| TF-IDF R1 R2 R3 R4 R4 R5 R6 R6 R7 R1 R1 R2 R3 R1 R1 R5 R6 R6 R7 R1 R1 R2 R3 R1 R1 R5 R6 R6 R7 R1 R1 R2 R3 R1 R1 R5 R6 R6 R7 R1 R1 R3 R1 R3 R4 R4 R5 R6 R6 R7 R7 R1 R7 R1 R7 R1 R1 R1 R1 | | | R6 | | | | | 0 | | | |
| TF-IDF R2 R3 R4 R4 R5 R4 R5 R6 R7 R1 R1 R1 R1 R2 R3 R4 R4 R5 R5 R5 R5 R5 R5 R5 R5 | | | R7 | \checkmark | | | ✓ | 1 | | | |
| TF-IDF | | | R1 | V | | | ~ | 1 | | | |
| TF-IDF | | | R2 | \checkmark | | | $\overline{}$ | 1 | | | |
| TF-IDF Easy Difficulty R5 R6 R6 R7 R1 R1 R1 R2 R3 R3 R4 R5 R5 R5 R5 R5 R5 R5 R5 R5 | | | R3 | \checkmark | | | $\overline{}$ | 1 | | | |
| R5 | TF-IDF | Q2 Facy Difficulty | R4 | \checkmark | $\overline{\mathbf{V}}$ | | \checkmark | 1 | 1 | 0.8214285714 | |
| TF-IDF R7 R1 R1 R1 R1 R2 R3 R4 R5 R5 R4 R5 R6 R7 R7 R1 R1 | | Lasy Dillicuity | R5 | $\overline{\mathbf{Z}}$ | \checkmark | | $\overline{}$ | 1 | | | |
| TF-IDF R1 R1 R2 R2 R2 R3 R4 R5 R6 R7 R7 R1 R2 R1 R2 R1 R3 R5 R6 R7 R1 R2 R1 R2 R3 R1 R3 R5 R6 R6 R7 R1 R2 R3 R4 R5 R5 R6 R7 R7 R8 R8 R8 R1 R8 R8 R8 R8 R8 R8 | | | R6 | | \checkmark | | $\overline{}$ | 1 | | | |
| TF-IDF R2 R3 R3 R4 R5 R6 R6 R7 R1 R2 R3 R4 R5 R6 R6 R7 R1 R2 R3 R1 R2 R3 R4 R5 R6 R6 R7 R1 R2 R3 R1 R2 R3 R1 R2 R3 R1 R3 R4 R5 R5 R1 R5 R5 R1 R5 R5 R1 R5 R5 | | | R7 | | \checkmark | | $\overline{}$ | 1 | | | |
| TF-IDF R2 R3 R3 R4 R5 R6 R6 R7 R1 R2 R3 R4 R5 R6 R6 R7 R1 R2 R3 R1 R2 R3 R4 R5 R6 R6 R7 R1 R2 R3 R1 R2 R3 R1 R2 R3 R1 R3 R4 R5 R5 R1 R5 R5 R1 R5 R5 R1 R5 R5 | | | R1 | ~ | | | | 0.25 | | | |
| TF-IDF R3 R4 R5 R6 R6 R7 R1 R2 R3 R1 R3 R3 R4 R5 R6 R6 R7 R7 R1 R2 R3 R3 R3 R3 R4 R5 R5 R5 R6 R5 R1 R5 R5 R5 R5 R5 R5 R5 R5 | | | R2 | | ~ | ~ | ~ | 1 | | | |
| TF-IDF R5 R6 R6 R7 R1 R2 R1 R2 R4 R6 R6 R7 R7 R1 R2 R1 R3 R4 R4 R5 R1 R3 R1 R4 R5 R5 R1 R5 R5 | | | R3 | | | | | 0.5 | | | |
| R5 | TF-IDF | Q3 | R4 | | ~ | ~ | | | 0.75 | | |
| R6 | | Lasy Dilliculty | R5 | | | | | 1 | | | |
| R7 Image: Control of the control of | | | | | | | | 1 | | | |
| TF-IDF R1 R2 R3 R3 R3 R4 R5 R6 R7 R5 R6 R7 R7 R1 R1 R1 R1 R2 R1 R2 R2 R3 R3 R3 R4 R5 R5 R6 R7 R5 R7 R7 R7 R7 R7 R7 R1 R1 R1 R1 | | | | | | | _ | 0.5 | | | |
| TF-IDF R2 R3 R3 R4 R4 R5 R6 R6 R7 R7 R7 R1 R2 R1 R2 R2 R1 R2 R3 | | | | | ✓ | | ✓ | | | | |
| TF-IDF | | | | ~ | ✓ | | ✓ | 1 | | | |
| TF-IDF | | | R3 | | | | | 0 | | | |
| R5 | TF-IDF | Q4 | | | | | | | 0.5714285714 | | |
| R6 | | Medium Difficulty | | | | | | | | | |
| R7 V V V 1 | | | | ~ | | | | 1 | | | |
| | | | | ~ | ~ | ~ | ✓ | 1 | | | |
| | | | | V | | | V | 1 | | | |
| R2 | | | | | | | | 0.75 | | | |
| R3 🗸 🗆 0.25 | | | R3 | | | | | 0.25 | | | |
| OE . | TF-IDF | Q5 | | | | | | | 0.5357142857 | 0.5119047619 | 0.4841269841 |
| R5 🗸 🗸 1 | | Medium Difficulty | | | ✓ | ✓ | | 1 | | | |
| R6 🔽 🔲 🗎 0.25 | | | | | | | | | | | |
| R7 0.25 | | | | | | | | | | | |
| R1 🗸 🗸 🗸 1 | | | | | | | | | | | |
| R2 0 0 | | | | | | | | | | | |
| R3 | | | | | | | | | | | |
| TE IDE Q6 0.4005744000 | TF-IDF | Q6 | | | | | | | 0.4285714286 | | |
| Medium Difficulty R4 | | iviedium Difficulty | | | | | | | | | |

| | | R6 | | ~ | V | | 1 | | |
|----------------------------|-----------------------|----|-------------------------|-------------------------|--------------|--------------|------|---------------|--------------|
| | | R7 | | | | | 0 | | |
| TF-IDF Q7 Hard Difficul | | R1 | <u> </u> | <u> </u> | <u> </u> | <u> </u> | 1 | | |
| | | R2 | | | | | 0 | | |
| | | R3 | | | | <u> </u> | 0.25 | | |
| | Q7 | R4 | ~ | | <u> </u> | <u> </u> | 0.75 | 0.3214285714 | |
| | Hard Difficulty | R5 | | | | | 0.25 | | |
| | | R6 | | | | | 0 | | |
| | | R7 | | | | | 0 | | |
| | | R1 | | | | | 0 | | |
| | | R2 | | | | | 0 | | |
| | | R3 | | | | | 0 | | |
| TF-IDF | Q8 Hard Difficulty | R4 | | | | | 0 | 0 | 0.119047619 |
| | riaid Dillicuity | R5 | | | | | 0 | | |
| | | R6 | | | | | 0 | | |
| | | R7 | | | | | 0 | | |
| | | R1 | | | | | 0 | | |
| | | R2 | | | | | 0 | | |
| | | R3 | | | | | 0 | 0.03571428571 | |
| TF-IDF | Q9 Hard Difficulty | R4 | | | | | 0 | | |
| | riara Dinicalty | R5 | | | | | 0 | | |
| | | R6 | ightharpoons | | | | 0.25 | | |
| | | R7 | | | | | 0 | | |
| | | R1 | ✓ | ✓ | ✓ | ✓ | 1 | | |
| | | R2 | ✓ | ✓ | <u> </u> | ✓ | 1 | | |
| | 04 | R3 | | | | | 0 | | |
| Word2Vec | Q1 Easy Difficulty | R4 | | | | | 0 | 0.4285714286 | |
| | | R5 | | | | | 0 | | |
| | | R6 | | | | | 0 | | |
| | | R7 | ✓ | ✓ | ✓ | ✓ | 11 | | |
| | | R1 | | \checkmark | ~ | \checkmark | 0.75 | | |
| | | R2 | ✓ | $\overline{\mathbf{V}}$ | <u> </u> | \checkmark | 1 | | |
| | 00 | R3 | | \checkmark | \checkmark | \checkmark | 0.75 | | |
| Word2Vec | Q2 Easy Difficulty | R4 | ✓ | \checkmark | \checkmark | \checkmark | 1 | 0.8571428571 | 0.5357142857 |
| | , | R5 | \checkmark | \checkmark | ~ | \checkmark | 1 | | |
| | | R6 | \checkmark | \checkmark | ~ | | 0.75 | | |
| | | R7 | \checkmark | <u>~</u> | <u> </u> | | 0.75 | | |
| | | R1 | $\overline{\mathbf{V}}$ | <u> </u> | | <u> </u> | 0.75 | | |
| | | R2 | $\overline{\mathbf{v}}$ | \checkmark | | | 0.5 | | |
| | 03 | R3 | \checkmark | \checkmark | | | 0.5 | | |
| Word2Vec | Q3 Easv Difficultv | R4 | \checkmark | \checkmark | | | 0.5 | 0.3214285714 | |

| | Lasy Dilliouity | R5 | | | | | 0 | | | |
|---|-----------------------|-----|----------|----------|----------|----------|---------------|------------------|--------------|--------------|
| | | R6 | | | | | 0 | | | |
| | | R7 | | | | | 0 | | | |
| | | R1 | | ✓ | | | 0.25 | | | |
| | | R2 | | | | | 0 | | | |
| | | R3 | | | | | 0.25 | | | |
| Word2Vec | Q4 | R4 | | ✓ | ✓ | <u>✓</u> | 0.75 | 0.5 | | |
| 110102100 | Medium Difficulty | R5 | | ✓ | | | 0.25 | 0.0 | | |
| | | R6 | | ✓ | | V | 1 | | | |
| | | R7 | ✓ | V | ✓ | V | <u>.</u> 1 | | | |
| | | R1 | ✓ | | | | 0.25 | | | |
| | | R2 | ~ | | | | 0.5 | | | |
| | | R3 | | | | | 0.5 | | | |
| Word2Vec | Q5 | R4 | | | | | 0.5 | 0.4285714286 | 0.5595238095 | 0.4404761905 |
| 110.02 100 | Medium Difficulty | R5 | | | | <u> </u> | 0.75 | 0.12007 14200 | 0.000020000 | 0.1101101000 |
| | | R6 | | | | | 0.5 | | | |
| | | R7 | | <u>✓</u> | | | 0.5 | | | |
| | | R1 | | <u>✓</u> | | | 0.25 | | | |
| | | R2 | | ✓ | | | 1 | | | |
| | | R3 | ✓ | | ✓ | | 1 | | | |
| Word2Vec | Q6 | R4 | ✓ | ✓ | <u>✓</u> | <u> </u> | 1 | 0.75 | | |
| Wordzvec | Medium Difficulty | R5 | | | | | 0 | 0.75 | | |
| | | R6 | | | | <u>✓</u> | 1 | | | |
| | | R7 | | | ✓ | <u> </u> | 1 | | | |
| | | R1 | | ✓ | | | 0.25 | | | |
| | | R2 | | | | | 0.25 | | | |
| | | R3 | | | | | 0 | | | |
| Word2Vec | Q7 Hard Difficulty | R4 | | | | | 0 | 0.03571428571 | | |
| *************************************** | Hard Difficulty | R5 | | | | | 0 | 0.0007 1 12007 1 | | |
| | | R6 | | | | | 0 | | | |
| | | R7 | | | | | 0 | | | |
| | | R1 | | | | | 0 | | | |
| | | R2 | | | | | 0 | | | |
| | | R3 | | | | | 0 | | | |
| Word2Vec | Q8 | R4 | | | | | 0 | 0 | 0.2261904762 | |
| | Hard Difficulty | R5 | | | | | 0 | | 0.220.001702 | |
| | | R6 | | | | | 0 | | | |
| | | R7 | | | | | 0 | | | |
| | | R1 | <u> </u> | <u> </u> | <u> </u> | | 1 | | | |
| | | R2 | | <u> </u> | ✓ | <u> </u> | 1 | | | |
| | | R3 | ✓ ✓ | ✓ ✓ | ✓ ✓ | <u>~</u> | 1 | | | |
| | 00 | 110 | | | | | ı | | | |

| Word2Vec | Q9 Hard Difficulty | R4 | ✓ | ~ | | ✓ | 0.75 | 0.6428571429 | | |
|----------|-------------------------|----|-------------------------|-------------------------|-------------------------|-------------------------|------|--------------|--------------|--------------|
| | Hard Difficulty | R5 | | | | | 0 | | | |
| | | R6 | <u> </u> | ~ | | <u>~</u> | 0.75 | | | |
| | | R7 | | | | | 0 | | | |
| | | R1 | <u> </u> | ✓ | | <u> </u> | 0.75 | | | |
| | | R2 | <u> </u> | <u> </u> | | <u> </u> | 0.75 | | | |
| | | R3 | $\overline{\mathbf{Z}}$ | | | | 0.75 | | | |
| BERT | Q1 Easy Difficulty | R4 | $\overline{\mathbf{Z}}$ | | $\overline{\mathbf{V}}$ | | 1 | 0.8571428571 | | |
| | Lasy Dilliculty | R5 | $\overline{\mathbf{Z}}$ | | \checkmark | | 1 | | | |
| | | R6 | $\overline{\mathbf{Z}}$ | | \checkmark | | 1 | | | |
| | | R7 | $\overline{\mathbf{Z}}$ | $\overline{\mathbf{V}}$ | | $\overline{\mathbf{Z}}$ | 0.75 | | | |
| | | R1 | | | | | 0 | | | |
| | | R2 | $\overline{\mathbf{Z}}$ | | $\overline{}$ | | 1 | | | |
| | | R3 | $ lap{}$ | | | | 1 | | | |
| BERT | Q2 Easy Difficulty | R4 | | | | | 0 | 0.3214285714 | 0.6428571429 | |
| | Easy Dimodity | R5 | | | | | 0 | | | |
| | | R6 | | | | | 0 | | | |
| | | R7 | | | | | 0.25 | | | |
| | | R1 | | \checkmark | | | 0.5 | | | |
| | | R2 | | \checkmark | $\overline{}$ | | 0.75 | | | |
| | 00 | R3 | | | ightharpoonup | | 0.25 | | | |
| BERT | Q3 Easy Difficulty | R4 | | ✓ | | \checkmark | 0.75 | 0.75 | | |
| | Lucy Simounty | R5 | $\overline{}$ | \checkmark | ightharpoonup | \checkmark | 1 | | | |
| | | R6 | $\overline{}$ | \checkmark | ightharpoonup | \checkmark | 1 | | | |
| | | R7 | ~ | \checkmark | \checkmark | <u>~</u> | 1 | | | |
| | | R1 | | | | | 0.25 | | | |
| | | R2 | | | | | 1 | | | |
| | 0.4 | R3 | | \checkmark | | | 1 | | | |
| BERT | Q4 Medium Difficulty | R4 | | | | | 0.25 | 0.5357142857 | | |
| | | R5 | | | | | 0.25 | | | |
| | | R6 | | | | | 0.75 | | | |
| | | R7 | | | | | 0.25 | | | |
| | | R1 | | | <u>~</u> | | 1 | | | |
| | | R2 | | | | | 0.5 | | | |
| | 05 | R3 | | | | | 0.75 | | | |
| BERT | Q5 Medium Difficulty | R4 | | | | | 0.75 | 0.8571428571 | 0.7023809524 | 0.6150793651 |
| | | R5 | <u> </u> | | <u> </u> | <u> </u> | 1 | | | |
| | | R6 | <u> </u> | | <u>~</u> | <u> </u> | 1 | | | |
| | | R7 | <u> </u> | <u> </u> | <u> </u> | <u> </u> | 1 | | | |
| | | R1 | <u> </u> | | | | 1 | | | |
| | | R2 | | | | | 1 | | | |

| | | R3 | | ✓ | | | 1 | | |
|---------------------|-----------------------|----------|-------------------------|-------------------------|---------------|--------------|------|----------------|-----|
| BERT | Q6 | R4 | | | | | 0 | 0.7142857143 | |
| 22.11 | Medium Difficulty | R5 | | <u> </u> | ✓ | | 1 | 0.1.1.2007.1.0 | |
| | | R6 | ✓ | V | ✓ | V | 1 | | |
| | | R7 | | | | | 0 | | |
| | | R1 | <u> </u> | | <u> </u> | <u> </u> | 1 | | |
| | | R2 | | | | | 0 | | 0.5 |
| | | R3 | | | | | 0 | | |
| BERT | Q7 Hard Difficulty | R4 | | | | | 0 | 0.2857142857 | |
| | Hard Difficulty | R5 | | | | | 0 | | |
| | | R6 | | | | | 0 | | |
| | | R7 | <u> </u> | | <u> </u> | <u> </u> | 1 | | |
| | | R1 | V | <u> </u> | | ~ | 1 | | |
| | Q8 Hard Difficulty | R2 | ~ | $lue{lue}$ | ightharpoons | | 1 | 0.7142857143 | |
| | | R3 | | | | | 0 | | |
| BERT | | R4 | ✓ | \checkmark | \checkmark | | 1 | | |
| | | R5 | ✓ | | \checkmark | ightharpoons | 1 | | |
| | | R6 | | | | | 0 | | |
| | | R7 | $\overline{\mathbf{V}}$ | | | | 1 | | |
| | | R1 | \checkmark | $\overline{\mathbf{V}}$ | \checkmark | \checkmark | 1 | 0.5 | |
| | Q9 Hard Difficulty | R2 | | $ lap{}$ | | | 0.25 | | |
| | | R3 | | | | | 0 | | |
| BERT | | R4 | \checkmark | \checkmark | ✓ | \checkmark | 1 | | |
| | | R5 | $ lap{}$ | \checkmark | $\overline{}$ | \checkmark | 1 | | |
| | | R6 | | | | | 0 | | |
| | | R7 | | \checkmark | | | 0.25 | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Difficulty \ Method | TF-IDF | Word2Vec | BERT | | | | | | |
| Easy | 82.14 | 53.57 | 64.29 | | | | | | |
| Medium | 51.19 | 55.95 | 70.24 | | | | | | |
| Hard | 11.90 | 22.62 | 50.00 | | | | | | |
| Overall | 48.41 | 44.05 | 61.51 | | | | | | |