LAPORAN

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KLASIFIKASI JENIS TUMOR OTAK BERDASARKAN CITRA MRI MENGGUNAKAN *CONVOLUTIONAL NEURAL NETWORK* MODEL VGG-19 & ResNet-50

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BAB I
PENDAHULUAN

I. Latar Belakang Masalah

Identifikasi citra medis merupakan salah satu dari banyak alasan dari pengembangan teknologi *neural network* yang telah banyak berkembang selama beberapa tahun terakhir. Banyak arsitektur *neural network* yang muncul dengan fokus dan lapisan yang berbeda untuk menyelesaikan permasalahan-permasalahan berbeda yang spesifik dan unik untuk masing-masing masalahnya. Salah satunya adalah untuk menganalisa citra medis MRI yang banyak digunakan untuk mendiagnosa penyakit atau kelainan pada otak.

Citra MRI dari otak pasien ini kemudian banyak digunakan oleh para dokter untuk membantu mendiagnosa penyakit apa yang sedang diderita oleh pasien yang dengan demikian, dokter dapat menentukan perawatan apa yang diperlukan oleh pasien untuk dapat mengatasi penyakitnya. Namun, citra MRI yang merupakan gambar dengan resolusi yang cukup rendah dan pencitraan yang kurang baik (karena bukan merupakan pencitraan dari refleksi cahaya, tetapi dengan menggunakan medan magnet), sehingga melakukan diagnosa yang akurat menjadi tantangan tersendiri bagi para dokter.

Oleh sebab itu, munculah gagasan untuk menggunakan teknologi *neural network* untuk melakukan klasisifikasi citra medis MRI dengan mengekstrak fitur yang dapat dikenali sebagai ciri-ciri dari suatu penyakit atau kelainan yang kemudian dapat membuat jaringan dapat mengenali citra tersebut secara lebih objektif. Banyak arsitektur yang dapat dimanfaatkan untuk aplikasi ini yang diantara lain adalah arsitektur VGGnet, VGG-19 dan arsitektur residual, ResNet-50.

II. Rumusan Masalah

Pada percobaan ini, akan dicobakan untuk mengolah *dataset* [LINK 1] mengenai identifikasi tumor otak yang diklasifikasikan menjadi 4 kategori (Glioma, Meningioma, Pituitary, dan Tanpa Tumor). Adapun arsitektur yang digunakan untuk mengolah *dataset* tersebut adalah arsitektur VGG-19 dan ResNet-50 yang kemudian dari kedua arsitektur tersebut akan dibandingkan performa nya (dengan parameter pembanding adalah akurasi

validasi dalam proses *Training* dan akurasi *Testing*). Dimana dari hasil percobaan, diharapkan penguji dapat kemudian menentukan arsitektur *neural network* mana yang lebih cocok untuk digunakan dalam proses klasifikasi tumor otak berdasarkan *dataset* [LINK 1] yang tersedia.

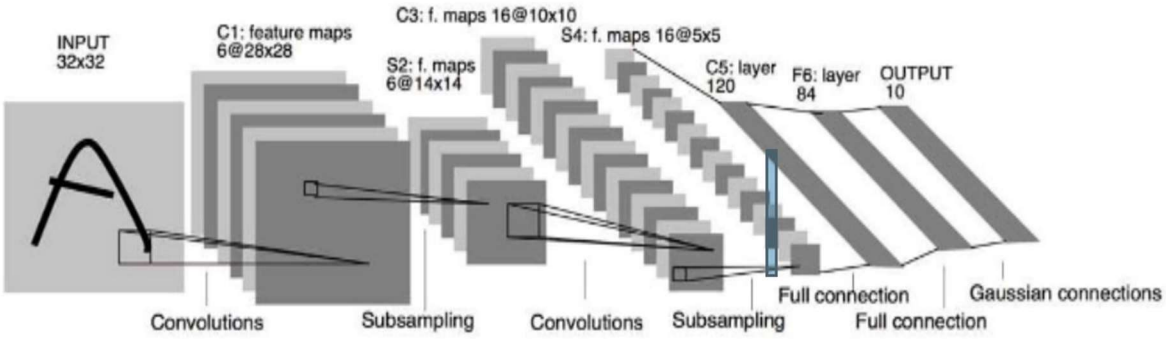
III. Batasan Masalah

Pada percobaan ini untuk dapat menilai perbedaan performa antara arsitektur VGG-19 dan ResNet-50 secara lebih objektif, maka proses *Training* dan *Testing* akan dibatasi menggunakan konfigurasi layer VGG-19 [LINK 2] dan layer ResNet-50 [LINK 3] *default* tanpa adanya modifikasi lanjutan. Selain itu, kondisi dan parameter-parameter proses *Training* dan *Testing* juga akan dilaksanakan dalam kondisi dan konfigurasi yang sama persis, sehingga harapannya hasil yang keluar adalah murni karena perbedaan performa antara kedua arsitektur terhadap berdasarkan *dataset* [LINK 1] yang tersedia.

BAB II
KAJIAN PUSTAKA DAN LANDASAN TEORI

I. Convolutional Neural Network (CNN)

Convolutional Neural Network (CNN) adalah salah satu metode pengolahan citra yang bekerja dengan cara membagi citra menjadi lapis RGB (*red, green,* dan *blue* sebagai representasi penyusun citra dari warna nya), dan kemudian dilakukan konvolusi dengan besar matriks konvolusi yang disesuaikan dengan besar *kernel* yang bekerja pada masing-masing lapis dengan tujuan untuk mengekstrak fitur, yang pada umumnya merupakan tepi dari suatu citra objek dengan tujuan untuk mengumpulkan fitur tersebut lalu menggabungkannya pada bagian akhir guna menyusun fitur yang telah diekstrak menjadi citra yang dapat dikenali untuk kemudian dapat mengklasifikasikan citra tersebut berdasarkan kelas/*label* yang telah didaftarkan sebelumnya.



Gambar 12 - Arsitektur Convolutional Neural Network (CNN) secara umum [1].

Adapun, berdasarkan ***Gambar 1***, CNN terdiri atas beberapa lapis jaringan yang mendukung fungsi konvolusi sebagai kerangka utamanya. Dimana lapisan utamanya terdiri atas *Input Layer, Convolution Layer, Full Connection Layer,* dan *Classification Layer* sebagai lapis keluarannya. Sementara itu pada lapisan tersembunyi nya terdapat *Non-Linearity Layer* yang pada umumnya terdiri atas lapisan *Rectified Linear Units* (ReLU), yang deskripsinya masing-masing akan dijelaskan pada poin-poin berikut:

1. ***Convolution Layer***

   Lapis konvolusi merupakan lapis inti dari seluruh jaringan CNN, dimana pada lapis ini citra yang kompleks di pecah menjadi sampel yang lebih kecil sehingga kompleksitas citra dapat diminimalisir agar *Full Connected Layer* dapat mengumpulkan dan menghubungkan fitur-fitur yang sudah di ekstrak dari masing-masing sampel dengan lebih efektif [2,4].

2. ***Non-Linearity Layer***

   Pada jaringan yang memiliki banyak lapisan, agar koneksi antara masing-masing lapis konvolusi dapat bekerja dan terhubung dengan baik, diperlukan lapisan non-linear (dengan ReLU yang paling umum dipakai) untuk dapat membedakan lapisan, kernel, dan besar subsampel satu dengan yang lain (karena pada umumnya aka nada beberapa lapisan dengan konfigurasi yang sama). Sehingga lapis yang selanjutnya dapat melanjutkan proses konvolusi berdasarkan besar subsampel yang terdaftar pada lapis yang sebelumnya [2].

3. ***Pooling Layer***

   Setelah seluruh proses konvolusi telah berhasil dilakukan, maka tahap selanjutnya adalah mengumpulkan dan menyatukan seluruh *feature maps* yang telah dibuat menjadi sebuah output untuk mengurangi parameter dan ukuran spasial keluaran untuk memudahkan proses komputasi yang juga akan berguna untuk mengendalikan proses *overfitting* [3].

Selain dari ketiga lapis proses yang sudah disebutkan, ada pula lapis masukan yang berfungsi untuk menyesuaikan dimensi citra yang ingin diproses agar sesuai dengan kompabilitas jaringan, dan lapis keluaran yang berupa lapis klasifikasi yang berguna untuk melakukan klasifikasi dengan menggunakan koneksi gaussian, dimana hasil bacaan akan disimpulkan menjadi peluang atas kemungkinan bahwa citra yang diklasifikasi lebih memungkinkan untuk masuk ke dalam kelas/label yang mana, berdasarkan daftar label yang telah terdaftar sebelumnya [2].

Dari arsitektur dasar CNN yang sudah dijelaskan, kemudian para pengembang muncul dengan berbagai pengembangan baru dengan karakteristik-karakteristik khusus

yang diharapkan dapat menunjang proses pengolahan citra dan aplikasi *neural network* secara umum. Dari antara banyak model pengembangan baru, beberapa diantaranya adalah arsitektur *Very Deep Learning*, VGGnet, dan *Residual Learning*, ResNet.

II. Very Deep Learning (VGG-net)

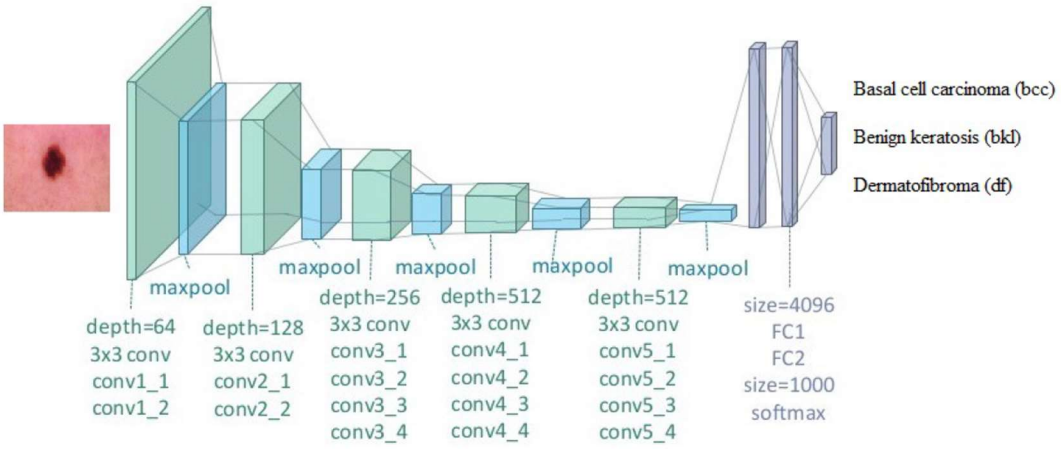
Metode pembelajaran jaringan *Very Deep Learning* adalah metode yang serupa dengan CNN yang sudah dibahas, yang menjadi pembeda adalah besar *kernel* yang dibuat sekecil mungkin (3×3) dan dengan harapan bahwa semakin kecil *kernel*, maka kedalaman hasil konvolusi akan semakin dalam, yang dengan demikian meningkatkan resolusi pembacaan fitur yang akan meningkatkan akurasi bacaan/klasifikasi [5].

Pooling Layer juga dibuat dengan jendela yang kecil (2×2) dengan *stride* sebesar 2 untuk meningkatkan resolusi subsampel dengan harapan bahwa *error* yang akan muncul akan berkurang. Selain itu juga dapat ditambahkan *Linearity Layar* dengan jendela sebesar 1×1 pixels untuk dapat meningkatkan *non-linearity* tanpa mengubah komposisi keluaran (meningkatkan efektivitas lapis ReLU) [5]. Adapun konfigurasi lapisan jaringan nya secara umum dapat dilihat pada ***Tabel 1***. Sementara itu pada pengujian pelatihan pada [5], didapati dari pengujian 11 sampai 19 lapis VGG-net, VGG-19 merupakan model dengan performa terbaik (dimana dapat disimpulkan adalah semakin banyak lapis, maka kompleksitas akan semakin tinggi dan akurasi akan meningkat, namun perlu diketahui bahwa ada batasan tertentu dalam menentukan jumlah lapisan dalam jaringan, karena apabila jumlah lapisan terlalu banyak dan kompleksitas menjadi tidak terkendali, maka akan muncul masalah kehilangan gradien yang akan menyebabkan pada divergen nya akurasi dan *loss*).

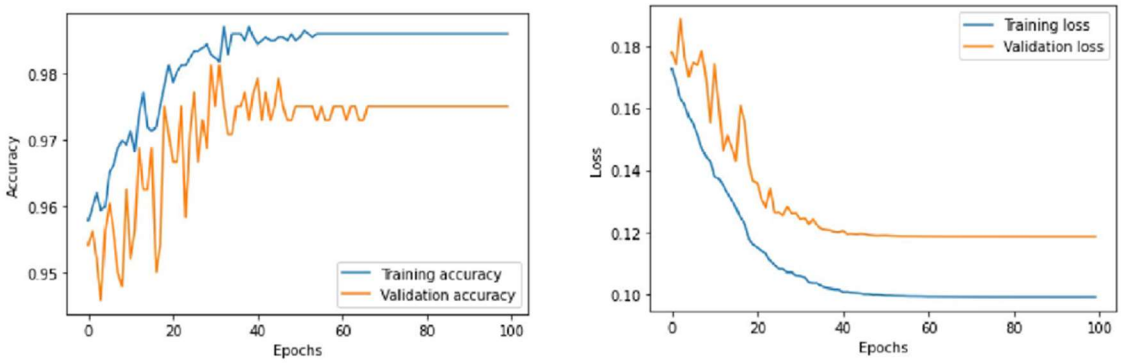
Sementara itu, konfigurasi lapisan jaringan untuk model VGG-19 secara spesifik dapat dilihat pada ***Gambar 2***. Sementara itu, hasil pengujian pada proses pelatihan dan validasi dengan menggunakan *dataset* HAM1000 menghasilkan akurasi keluaran yang cukup baik pada percobaan dengan 100 *epoch*. Adapun grafik pada ***Gambar 3***, menunjukkan bahwa akurasi sudah konvergen pada *epoch* ke-50, dan tidak menunjukkan perubahan yang cukup berarti hingga *epoch* ke-100. Namun dari hasil akurasi validasi pada ***Tabel 2*** masih belum menunjukkan tanda-tanda *overfitting*. Ditunjukkan dengan akurasi pelatihan dan validasi yang tidak jauh berbeda.

ConvNet Configuration					
A	A-LRN	B	C	D	E
11 weight layers	11 weight layers	13 weight layers	16 weight layers	16 weight layers	19 weight layers
input (224 × 224 RGB image)					
conv3-64	conv3-64 **LRN**	conv3-64 **conv3-64**	conv3-64 conv3-64	conv3-64 conv3-64	conv3-64 conv3-64
maxpool					
conv3-128	conv3-128	conv3-128 **conv3-128**	conv3-128 conv3-128	conv3-128 conv3-128	conv3-128 conv3-128
maxpool					
conv3-256 conv3-256	conv3-256 conv3-256	conv3-256 conv3-256	conv3-256 conv3-256 **conv1-256**	conv3-256 conv3-256 **conv3-256**	conv3-256 conv3-256 conv3-256 **conv3-256**
maxpool					
conv3-512 conv3-512	conv3-512 conv3-512	conv3-512 conv3-512	conv3-512 conv3-512 **conv1-512**	conv3-512 conv3-512 **conv3-512**	conv3-512 conv3-512 conv3-512 **conv3-512**
maxpool					
conv3-512 conv3-512	conv3-512 conv3-512	conv3-512 conv3-512	conv3-512 conv3-512 **conv1-512**	conv3-512 conv3-512 **conv3-512**	conv3-512 conv3-512 conv3-512 **conv3-512**
maxpool					
FC-4096					
FC-4096					
FC-1000					
soft-max					

Tabel 6 - Konfigurasi Umum Lapisan Jaringan VGG-net [5].



Gambar 13 - Konfigurasi Arsitektur VGG-19 [6].



Gambar 14 - Perubahan nilai Training dan Validation Accuracy (kiri) dan Loss (kanan) [6].

Epoch	Training		Validation	
	Accuracy	Loss	Accuracy	Loss
25	0.9823	0.1094	0.9708	0.1264
50	0.9849	0.0997	0.9750	0.1188
100	0.9859	0.0991	0.9750	0.1185

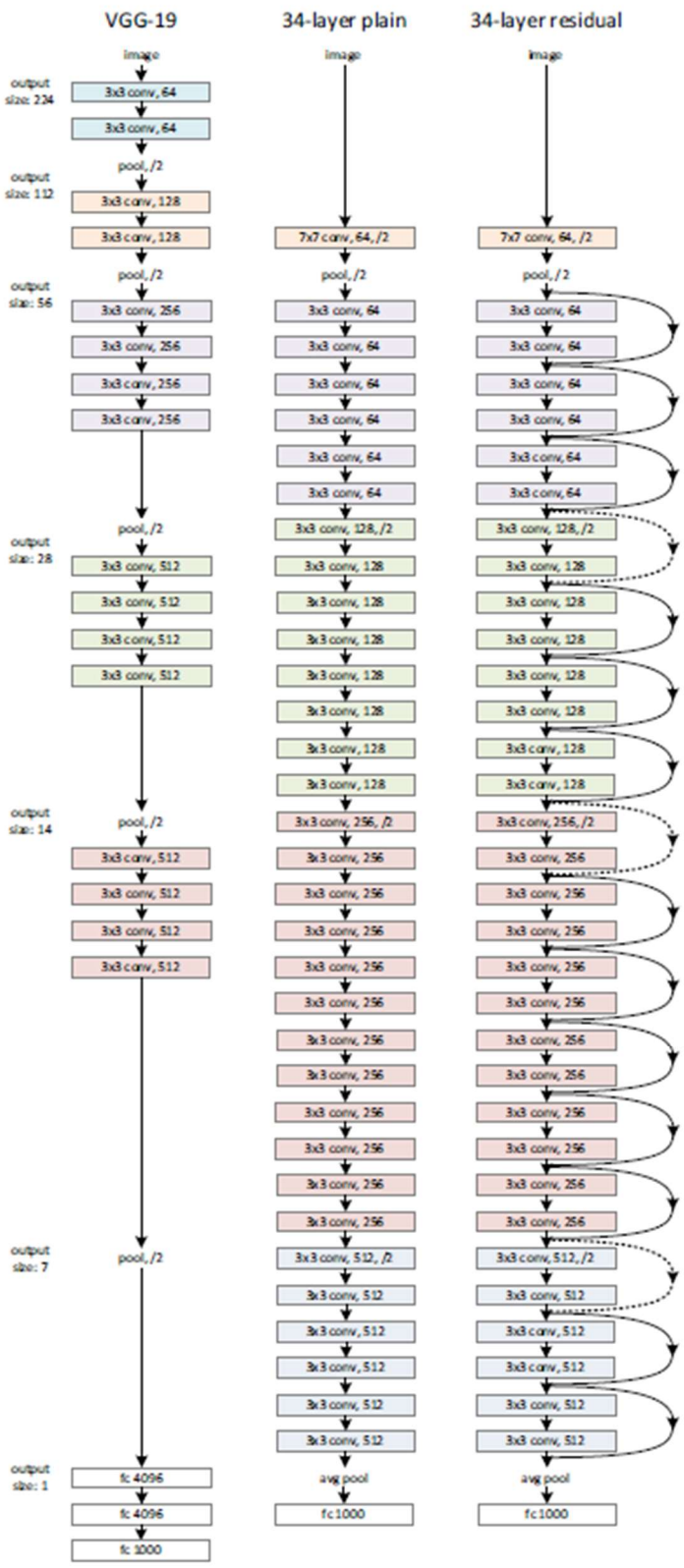
Tabel 7 - Catatan Akurasi VGG-19 [6].

III. Residual Deep Learning (ResNet)

Jika pada VGG-net atau arsitektur CNN biasa, pengguna memiliki keterbatasan untuk menentukan jumlah lapisan dari arsitektur yang mereka rancang karena masalah *vanishing gradient* dan subsampel yang terlalu dalam dengan fitur yang tidak cukup jelas untuk dianalisis yang dapat menyebabkan divergensi nilai bacaan akurasi pada jaringan dengan lapis berlebih, yang akan berakibat pada turunnya akurasi [7].

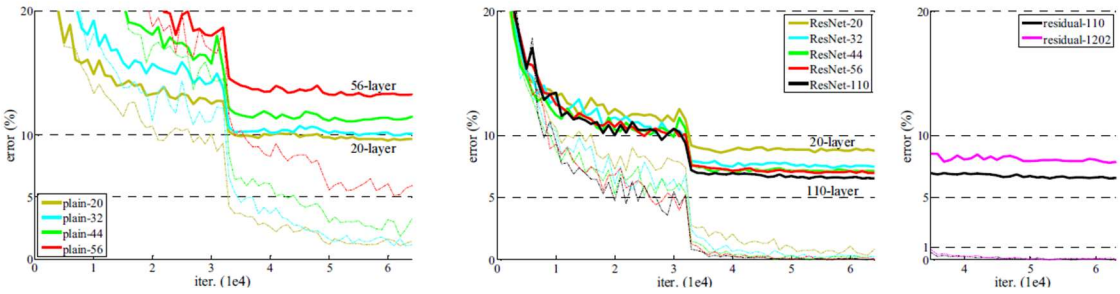
Untuk mengatasi permasalahan tersebut, ResNet di rancang untuk memanfaatkan *Residual Mapping* alih-alih *Original Mapping* yang umumnya dipakai sebagai parameter pembacaan fitur pada proses klasifikasi citra, dengan anggapan bahwa *Residual Mapping* sudah mengandung informasi yang cukup bagi model untuk dapat dimanfaatkan untuk mengkategorikan citra ke dalam kelas yang sudah terdaftar.

Pada arsitektur ResNet, digunakan *shortcut connection* yang dapat digunakan untuk melewati beberapa lapis tanpa perlu diproses lebih lanjut apabila dirasa hasil bacaan sudah cukup untuk dapat dikenali tanpa perlu proses yang lebih detail. Dengan demikian, meskipun memiliki konfigurasi lapisan yang lebih banyak, beban komputasi dapat dikurangi untuk mengurangi waktu pelatihan/validasi.



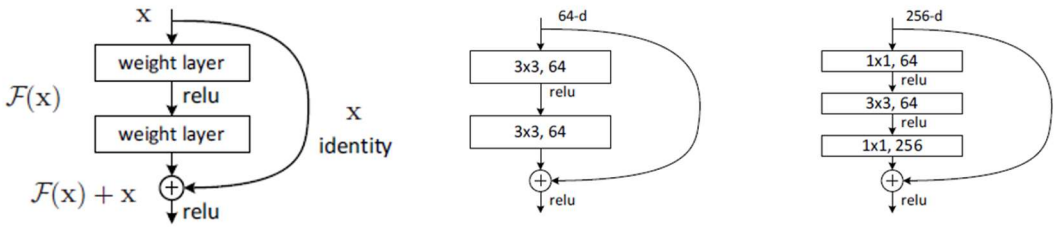
Gambar 15 - Perbandingan Konfigurasi antara arsitektur VGG-19 (kiri), CNN 34 Lapis (tengah), dan ResNet-34 (kanan) [8].

Dengan memanfaatkan *shortcut connection* ini, jaringan dapat menjaga konvergensi akurasinya meskipun membuat lapisan jaringan menjadi sebanyak mungkin (dapat dilihat pada ***Gambar 5***). Dan dengan demikian, meskipun jaringan residual yang dirancang memiliki jumlah lapisan yang jauh lebih banyak jika dibandingkan dengan model-model lainnya, namun kestabilan akurasi nya masih dapat terjaga dengan baik dan terhindar dari masalah *vanishing gradient*. Dengan *shortcut connection* ini pula, arsitektur jaringan residual memiliki proses yang lebih cepat karena memang memiliki jumlah filter yang lebih sedikit [8].



Gambar 16 - Perbandingan nilai error terhadap jumlah lapisan pada jaringan CNN biasa (kiri), ResNet (tengah), dan percobaan pada jumlah lapisan yang esktrim (1202) pada jaringan residual (kanan) [8].

Sementara itu, untuk arsitektur ResNet dengan jumlah lapisan 50 dan selebihnya, alih-alih menggunakan blok residual biasa, diaplikasikanlah *Bottleneck Building Block* yang serupa dengan blok residual biasa, namun dengan tambahan blok konvolusional 1×1 yang berguna untuk membuat proyeksi linear dari *Feature Maps* yang ditumpuk (menjadi *depth*) dengan tujuan untuk mengurangi (atau mengembalikan) dimensi, atau untuk menambahkan jumlah *Feature Maps* [8]. Adapun hasil pengujian [8] menunjukkan bahwa arsitektur yang menggunakan blok *Bottleneck* menampilkan performa yang lebih baik seperti yang dapat dilihat pada ***Tabel 3***.



Gambar 17 - Blok Residual Biasa (kiri), beserta konfigurasi lapis konvolusinya (tengah), dan Blok Bottleneck untuk konfigurasi jaringan ResNet-50/101/152 (kanan) [8].

method	top-1 err.	top-5 err.
VGG [40] (ILSVRC'14)	-	8.43†
GoogLeNet [43] (ILSVRC'14)	-	7.89
VGG [40] (v5)	24.4	7.1
PReLU-net [12]	21.59	5.71
BN-inception [16]	21.99	5.81
ResNet-34 B	21.84	5.71
ResNet-34 C	21.53	5.60
ResNet-50	20.74	5.25
ResNet-101	19.87	4.60
ResNet-152	**19.38**	**4.49**

Tabel 8 - Error dari percobaan single-model menggunakan dataset ImageNet [8].

IV. Tumor Otak

Tumor Otak merupakan pertumbuhan sel asing secara tidak terkendali, yang terbentuk pada bagian tertentu pada otak. Adapun pertumbuhan sel tersebut dapat terjadi secara alami, atau merupakan *metastasis*, atau penyebaran sel kanker dari organ lainnya yang juga memiliki sel kanker. Sedangkan untuk jenis-jenis dari tumor otak ini kemudian dibagi berdasarkan lokasi dan tingkat keganasannya [LINK 4].

Sel tumor dapat tumbuh di hampir seluruh bagian pada otak, namun mayoritas kasus tumor otak yang serius (primer) terjadi pada sel glial, atau sel yang mengubungkan sel saraf pada otak. Sedangkan untuk tingkat keganasannya, tumor otak dibedakan menjadi jinak (*benign*) atau ganas (*malignant*). Dimana pada kasus tumor jinak, sel kanker cenderung tidak menyebar, namun harus tetap diawasi secara berkala. Sedangkan pada kasus tumor ganas, pasien harus segera mendapat perawatan yang intensif untuk mencegah persebaran sel kanker dan mengatasi komplikasi yang mungkin akan terjadi [LINK 4].

Adapun beberapa jenis tumor otak yang sering terjadi adalah: Meningioma, Adenoma pituitari, Neuroma akustik, Craniopharyngioma, Tumor kelenjar pineal, Tumor otak glioma, Limfoma sistem saraf pusat, dan Tumor otak metastasis [LINK 4].

V. Tumor Sel Glial (Glioma)

Glioma merupakan sel tumor yang mulai berkembang dari sel glial pada otak, yaitu sel yang menghubungkan saraf pada otak. Adapun dari tingkat keganasannya, WHO membagi nya ke dalam 4 kategori, yaitu: WHO grade I (potensi proliferasi rendah, kurabilitas cukup baik), WHO grade II (infiltratif, mitosis rendah, namun kerap timbul rekurensi/kambuhan), WHO grade III (mitosis jelas, infiltrasi tinggi, terdapat anaplasia), WHO grade IV (mitosis aktif, nekrosis, progresivitas penyakit cepat) [11].

Sedangkan, secara histologik, Tumor Sel Glial terbagi menjadi beberapa jenis, yaitu: *Astrocytic tumours, Oligodendrial tumours, Oligoastrocytic tumours, Ependymal tumours, Choroid plexus tumour, Other neuroepithelial tumours. Neuronal and mixed neuronal-glial tumours, Tumours of the pineal region,* dan *Embryonal tumours* [11].

VI. Meningioma

Meningioma merupakan tumor jinak intrakranial yang sering dijumpai pada pasien tumor otak dengan estimasi 13-26% dari kesuluruhan tumor primer intrakranial dan berasal dari *arachnoid cap cells* durameter. Pada umumnya tidak berbahaya (paling umum, untuk grade I). Gambaran lesi Meningioma umumnya jelas, namun pada kasus khusus yang tumbuh pada *sphenoid ridge* atau disebut sebagai *meningioma en plaque*, gambaran lesi difus/tidak terlalu jelas. Meskipun umumnya jinak, namun pada grade II, bisa terjadi rekurensi dan pada grade III (jarang terjadi), bersifat papiler, rhabdoid, dan anaplastik. Meningioma grade III diklasifikasikan sebagai Meningioma Malignant [11].

VII. Adenoma Pituitari

Ademoma pituitari adalah tumor otak yang tumbuh pada kelenjar pituitari. Kelenjar pituitary sendiri adalah kelenjar yang berfungsi untuk melepaskan hormon ke dalam aliran darah. Tumor jenis ini pada umumnya jinak, namun dapat menjadi serius ketika timbul komplikasi yang berhubungan dengan kelainan hormon. Untuk mengatasi kelainan hormon akibat tumor jenis ini, pasien dapat disuplai dengan obat pengganti hormone, dan dapat disembuhkan dengan prosedur radioterapi [LINK 4].

BAB III
METODOLOGI

I. Spesifikasi Perangkat yang Digunakan

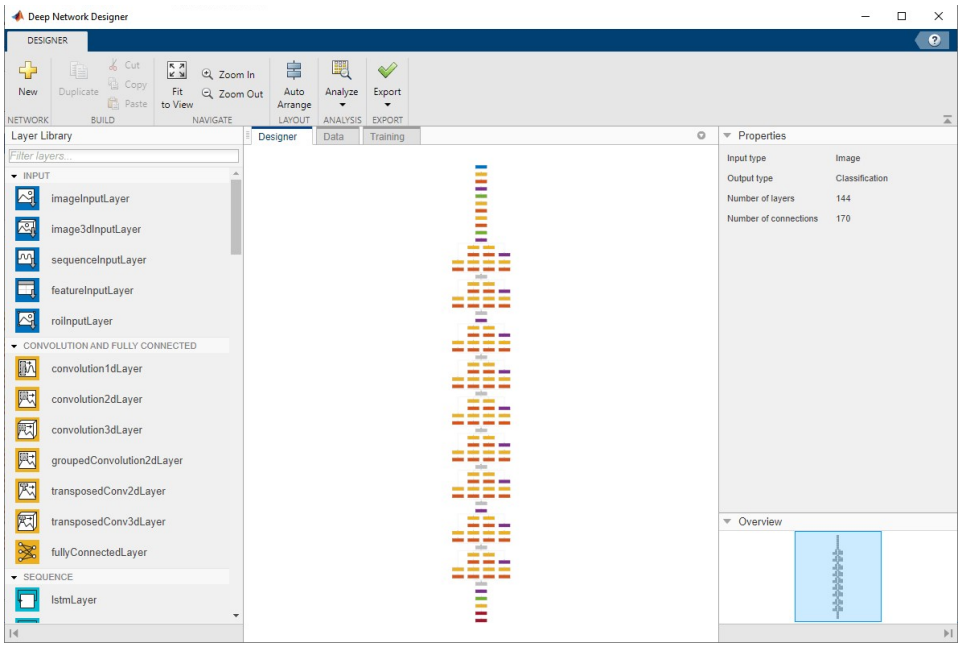
Pengujian untuk melatih dan menggunakan *neural network* dengan arsitektur VGG-19 dan ResNet-50, seluruhnya dilakukan pada perangkat *Laptop* Lenovo YOGA C640 dengan spesifikasi lengkap dapat dilihat pada tautan berikut [LINK 5]. Adapun perangkat bergerak dengan sistem operasi Windows 10 dengan aplikasi MATLAB versi 2019b terpasang di dalamnya sebagai aplikasi pemroses utama yang akan dipakai dalam pengujian ini.

II. Aplikasi Pemrograman yang Digunakan

Pengujian pelatihan dan validasi penggunaan *neural network* ini akan dilaksanakan menggunakan *platform* MATLAB 2019b, khususnya dengan menggunakan *Deep Network Designer Toolbox* yang tersedia pada aplikasi MATLAB [LINK 6] sebagai instrumen yang digunakan untuk menyusun lapisan *neural network* untuk kemudian dapat dilatih untuk mengerjakan tugas tertentu. *Deep Network Designer Toolbox* dapat diakses dengan menggunakan perintah `deepNetworkDesigner` pada *console*.

Adapun untuk MATLAB 2019b, karena *Deep Network Designer Toolbox* hanya dapat digunakan untuk merancang, namun tidak dapat mensimulasikan kerja jaringan secara langsung, maka akan direkomendasikan untuk meng-*generate equivalent code* nya untuk kemudian dijalankan guna menghasilkan mencatatkan jaringan pada *Workspace* di MATLAB (*source code* dapat dilihat pada [LAMPIRAN 3] untuk VGG-19 dan [LAMPIRAN 6] untuk ResNet-50, atau bisa juga dilakukan secara langsung dengan menekan tombol *Export* lalu memilih untuk *export to workspace*, untuk mencatatkan jaringan di *Workspace*).

Setelah *toolbox* berhasil terbuka, maka pengguna dapat menyusun lapisan jaringan menggunakan pilihan jenis jaringan yang tersedia pada *Layer Library* yang dapat diakses pada *toolbox* bagian kiri, seperti yang dapat dilihat pada ***Gambar 7***. Dari masing-masing lapisan kemudian dapat dihubungkan satu sama lain dengan menarik garis pada bagian bawah *layer* dan dihubungkan pada bagian atas *layer* yang selanjutnya.



Gambar 18 - Contoh tampilan Deep Network Designer pada MATLAB [LINK 6].

Setelah *neural network* yang diinginkan berhasil disusun dan masing-masing lapisan nya telah dihubungkan berdasarkan [LINK 2, LAMPIRAN 1] untuk arsitektur VGG-19, dan berdasarkan [LINK 3, LAMPIRAN 2] untuk arsitektur ResNet-50 (dengan nilai parameter yang telah disesuaikan dengan konfigurasi umum untuk masing-masing arsitekturm, dan penyesuaian lebar keluaran untuk jumlah kelas yang telah terdaftar pada *dataset* yang digunakan [LINK 1]), maka tahap selanjutnya adalah untuk melakukan *Export* pada masing-masing arsitektur ke *Workspace* agar dapat diproses untuk dilatih.

III. Langkah Pelatihan Neural Network

Jaringan *neural network* yang sudah di rancang dan ditempatkan pada *Workspace*, pada konsol MATLAB, kemudian dapat di latih dengan menggunakan data latih yang sudah disiapkan, dimana proses pelatihan nya dapat di picu berdasarkan *source code* yang tertera pada [LAMPIRAN 4] untuk jaringan VGG-19 dan [LAMPIRAN 7] untuk jaringan ResNet-50. Pada dasarnya keduanya memiliki fungsi dan runtutan perintah yang sama, dimana yang menjadi pembeda adalah nama variabel (jaringan) yang kemudian diproses untuk di latih. Adapun pelatihan dilakukan dengan tahapan sebagai berikut:

```
addpath('C:\Users\LENOVO\OneDrive\Desktop\Materi
Kuliah\Semester 7\Teknik Neurofuzi\Tugas\Deep Learning
Project\Program Files\VGG19');

unzip('Training.zip');

imds =
imageDatastore('Training','IncludeSubfolders',true,'LabelSo
urce','foldernames');

[imdsTrain,imdsValidation] =
splitEachLabel(imds,0.7,'randomized');
```

Pada bagian inisiasi awal, penguji perlu untuk mendaftarkan lokasi dari *dataset* untuk mengakses berkas yang dimaksud. Untuk dapat melakukan ini, penguji perlu menjalankan MATLAB sebagai *Administrator* untuk mendapatkan akses menggunakan perintah `addpath`. Setelah berkas berhasil dimuat dalam format ZIP, berkas kemudian dapat di ekstrak menggunakan perintah `unzip`, dimana berkas yang berhasil di ekstrak tersebut dapat dikategorikan berdasarkan lokasi folder yang akan di daftarkan sebagai kelas pada pembacaan direktori di MATLAB menggunakan perintah `imageDatastore`.

Pada proses pelatihan, *dataset* yang dibagi menjadi dua bagian untuk pelatihan itu sendiri dan untuk validasi hasil pelatihan. Pada *source code* yang tertera pada [LAMPIRAN 4, LAMPIRAN 7], ditentukan bahwa *dataset* akan dibagi dengan proporsi 70% untuk pelatihan dan 30% untuk validasi, dengan proses pemisahan secara acak menggunakan perintah `splitEachLabel`. *Dataset* yang berhasil dipisahkan, kemudian di daftarkan sebagai variabel baru dengan nama `imdsTrain` untuk *dataset* pelatihan dan `imdsValidation` untuk *dataset* validasi.

```
augimdsTrain = augmentedImageDatastore([224
224],imdsTrain);
augimdsValidation = augmentedImageDatastore([224
224],imdsValidation);

options = trainingOptions('sgdm', ...
    'MiniBatchSize',10, ...
    'MaxEpochs',6, ...
    'Shuffle','every-epoch', ...
    'InitialLearnRate',1e-4, ...
    'ValidationData',augimdsValidation, ...
    'ValidationFrequency',6, ...
```

```
'Verbose',false, ...
'Plots','training-progress');
```

Tahap selanjutnya adalah melakukan penyesuaian ukuran citra untuk disesuaikan dengan besar lapis masukan (224 × 224) dengan menggunakan perintah `augmentedImageDatastore`, sementara itu konfigurasi kondisi pelatihan dapat dilakukan dengan menggunakan perintah `trainingOptions`. Perintah ini dilengkapi dengan beberapa sub-perintah yang dapat digunakan untuk menentukan nilai masing-masing dari parameter pelatihan yang dapat disesuaikan untuk menunjang proses pelatihan. Pada pelatihan ini, akan dilakukan sebanyan 6 *epoch* dengan masing-masing *epoch* terdiri atas 200 iterasi dan frekuensi validasi sebesar 6. Pengaturan ini diterapkan untuk melatih jaringan VGG-19 dan ResNet-50. Lingkungan pelatihan yang sama diterapkan untuk kedua model jaringan untuk dapat menghasilkan keluaran pembanding yang lebih obyektif. Adapun parameter pengaturan pelatihan yang sudah diterapkan kemudian didaftarkan dengan nama variabel `options` untuk dapat dipanggil kemudian, pada proses pelatihan.

```
netTransfer = trainNetwork(augimdsTrain,layers_1,options);
```

Pada tahap pelatihan yang terakhir, jendela pelatihan kemudian dibuka dan pelatihan akan dilaksanakan menggunakan perintah `trainNetwork`, berdasarkan *dataset* yang sudah didaftarkan pada variabel `augimdsTrain`, dijalankan dengan jaringan yang sudah terdaftar di *Workspace* dengan nama variabel `layers_1` untuk VGG-19 [LAMPIRAN 4] dan `lgraph` untuk ResNet-50 [LAMPIRAN 7], dengan konfigurasi parameter pelatihan yang terdaftar pada variabel `options`. Hasil pelatihan kemudian akan didaftarkan dengan nama variabel `netTransfer`, sebagai *DAGNetwork*. Dari jaringan yang sudah selesai dilatih, penguji dapat melihat nilai *weights* dan *bias* dari jaringan yang telah dilatih [LAMPIRAN 9, LAMPIRAN 10] dengan menggunakan perintah `netTransfer.Layers(2).Weights` dan `netTransfer.Layers(2).Bias`.

IV. Langkah Pengujian Neural Network

Jaringan yang sudah terlatih dan terdaftar dengan nama `netTransfer`, kemudian dapat digunakan untuk menjalankan tugas yang telah dirancang, yaitu untuk mengklasifikasikan jenis citra tumor otak yang tersimpan dalam *dataset* dengan nama *Testing*. Proses untuk memuat berkas *dataset* sama dengan apa yang dilakukan dalam proses pelatihan, yang menjadi pembeda hanyalah nama berkas dari yang tadinya *Training.zip*, menjadi *Testing.zip*. Dan alih-alih membagi *dataset* menjadi dua bagian, pada proses pengujian tidak ada pembagian *dataset* karena seluruh data akan digunakan untuk proses validasi, yang demikian juga berlaku untuk proses penyesuaian ukuran citra.

```
[YPred,probs] = classify(netTransfer,augimdsValidation);
accuracy = mean(YPred == imdsValidation.Labels)
```

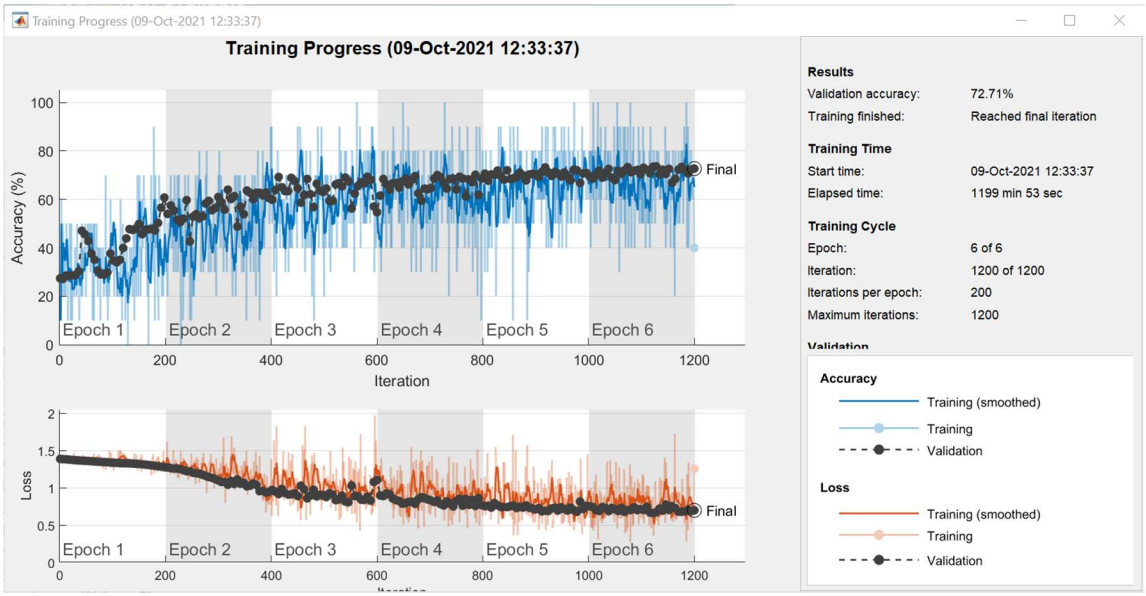
Sementara itu, untuk proses pengujian nya sendiri dilakukan dengan menggunakan perintah `classify`. Adapun keluaran dari dari fungsi tersebut didaftar kedalam 2 variabel, yaitu `YPred` yang berfungsi untuk menyatakan prediksi dari kelas atas citra yang telah di proses dan variabel `probs` yang menyatakan peluang/tingkat keyakinan atas prediksi yang diberikan. Sedangkan akurasi pengujian diukur dengan menghitung rerata dari keberhasilan prediksi kelas pada *dataset* dengan membandingkan kelas yang diprediksi (pada variabel `YPred`) dan kelas yang sebenarnya (pada variabel `imdsValidation.Labels`).

```
idx = randperm(numel(augimdsValidation.Files),9);
figure
for i = 1:9
    subplot(3,3,i)
    I = readimage(imdsValidation,idx(i));
    imshow(I)
    label = YPred(idx(i));
    title(string(label) + ", " +
num2str(100*max(probs(idx(i),:)),3) + "%");
end
```

Setelah mengukur nilai akurasi, meskipun opsional, penguji dapat mencetak beberapa sampel citra beserta dengan prediksi kelas dan tingkat keyakinan/peluang atas benarnya prediksi tersebut menggunakan perintah diatas [LAMPIRAN 5, LAMPIRAN 8].

BAB IV
HASIL DAN ANALISIS

I. Hasil Training & Testing Jaringan VGG-19

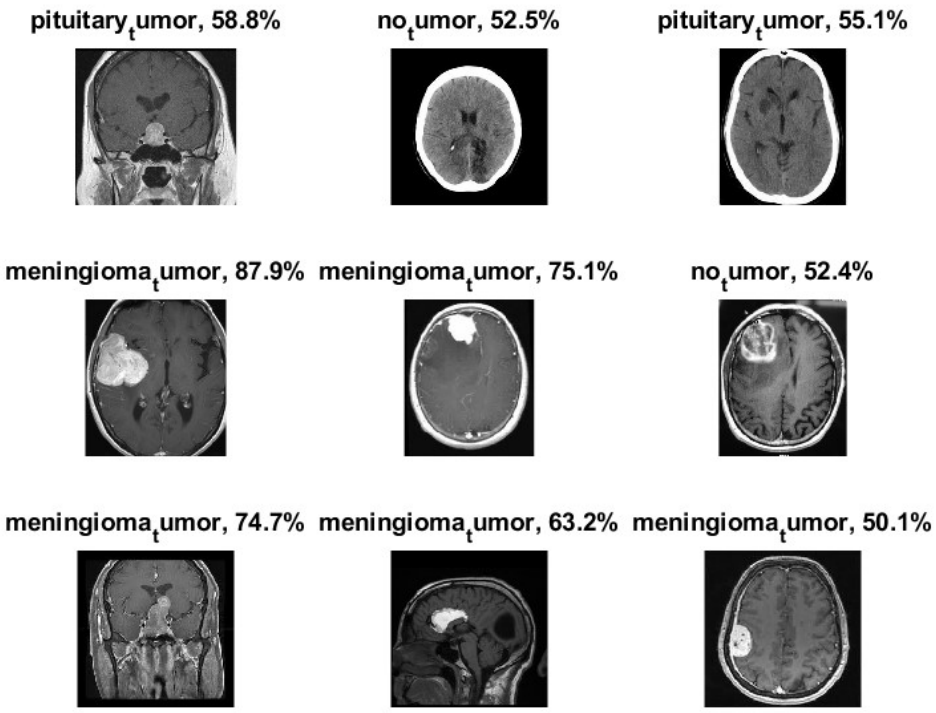


Gambar 19 - Hasil Training dan Validation Jaringan VGG-19.

Setelah berhasil melatih jaringan sebanyak 6 *epoch* dengan total mencapai 1200 iterasi dengan masa pelatihan selama 1199 menit dan 53 detik, dapat dilihat pada ***Gambar 8***, bahwa sejauh hasil pengamatan, akurasi pelatihan dan validasi masih bergerak naik meskipun sudah mulai berkurang kenaikannya sejak memasuki pertengahan *epoch* ke-2. Dengan akurasi validasi tercatat pada iterasi terakhir sebesar 72,71%, namun jika melihat ke karakteristik kurva validasi, dapat diketahui bahwa hasil tersebut belum merupakan potensi maksimum dari model jaringan ini, mengingat bahwa kurva masih belum menunjukkan tanda-tanda konvergen meskipun kenaikannya sudah cukup melambat. Hal yang sama berlaku terbalik untuk nilai *loss* dari bacaan gambar diatas.

Adapun pada jaringan yang sudah berhasil dilatih, maka nilai *Weight* dan *Bias* dari jaringan berubah dari nilai asalnya, menjadi rangkaian nilai yang dapat di lihat pada [LAMPIRAN 9]. Nilai-nilai tersebut menyesuaikan dengan proses pelatihan, yang dalam kasus ini, dirancang untuk dapat mendeteksi/mengklasifikasikan citra MRI dari pasien tumor otak. Setelah jaringan dirasa sudah selesai di latih dan sudah siap untuk digunakan, maka

tahap selanjutnya adalah melakukan proses pengujian dengan menggunakan beberapa citra MRI pasien tumor otak dengan *dataset* yang berbeda dari *dataset* pelatihan, untuk proses ini, digunakan *dataset* terpisah yang di labeli dengan *dataset Testing.* Dari hasil pengujian ini, didapati bahwa rerata akurasi dari masing-masing pengujian tercatat sebesar 0.4086, atau 40,86%. Dari keseluruhan citra dalam *dataset* yang diujikan, berikut beberapa sampel pengujian yang dapat di lihat pada ***Gambar 9***.

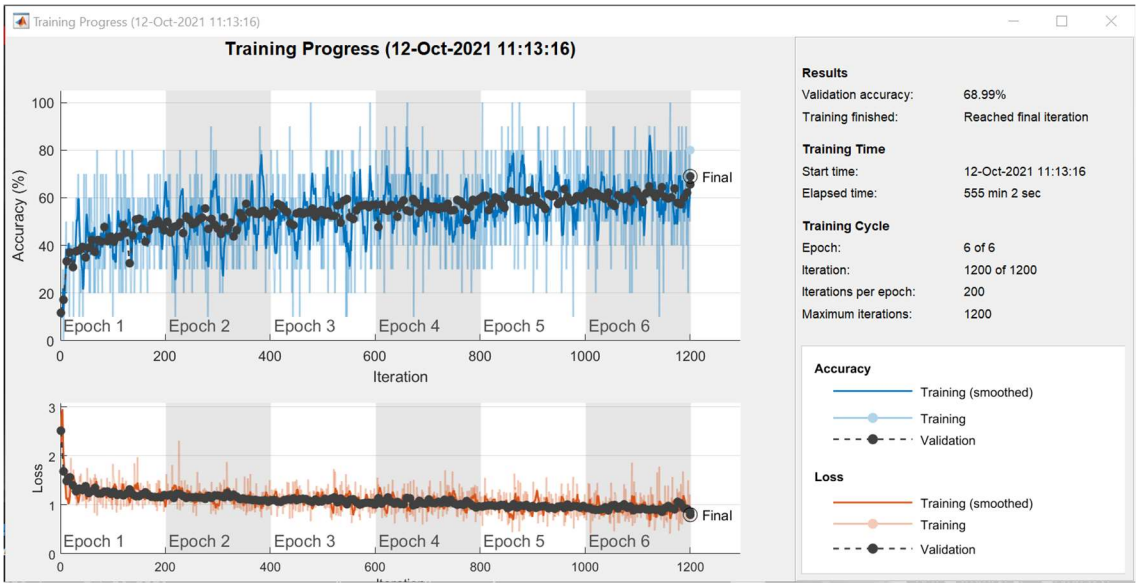


Gambar 20 - Beberapa sampel hasil pengujian/klasifikasi citra berdasarkan kelas yang terdaftar dan derajat kepastiannya (dalam bentuk nilai peluang) menggunakan jaringan VGG-19.

II. Hasil Training & Testing Jaringan ResNet-50

Dengan kondisi pelatihan yang sama dengan konfigurasi lingkungan pelatihan yang digunakan untuk melatih jaringan VGG-19, setelah berhasil dilatih selama 555 menit dan 2 detik, didapati bahwa pada iterasi terakhir, akurasi validasi tercatat sebesar 68,99%. Apabila diamati laju kenaikan akurasi dan penurunan *loss* bergerak secara linier, tercatat sejak pertengahan *epoch* 1, seperti yang dapat dilihat pada ***Gambar 10***. Laju pergerakan

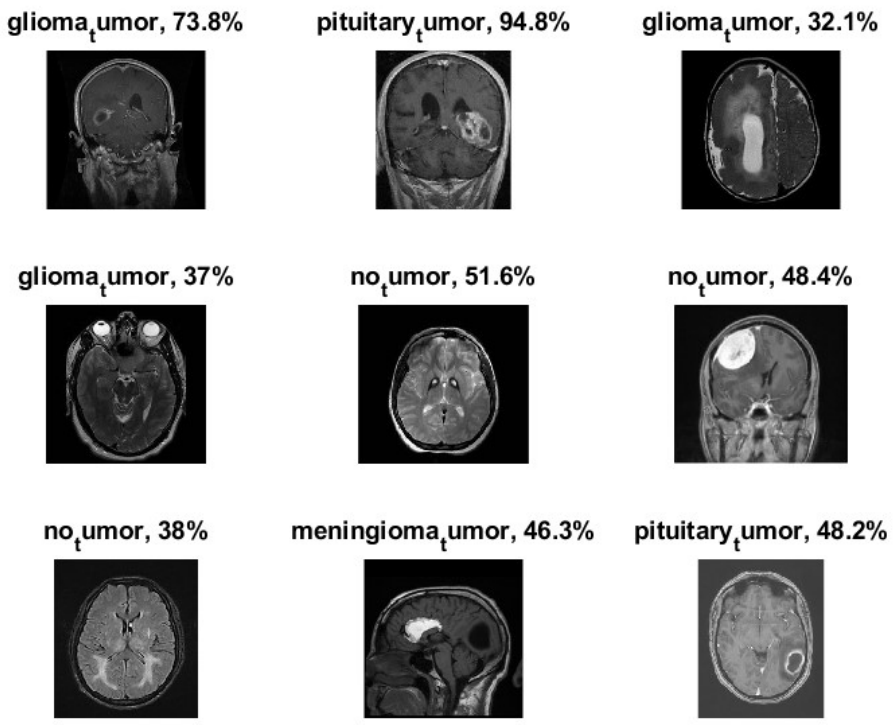
gradien kenaikan nilai akurasi juga belum terlihat tanda-tanda bahwa nilai akurasi akan segera konvergen. Sehingga dapat diestimasikan bahwa akurasi validasi yang tercatat belum dapat dikatakan sebagai nilai akurasi maksimal yang dapat dicapai oleh arsitektur ResNet-50 untuk *dataset* terkait [LINK 1].



Gambar 21 - Hasil Training dan Validation Jaringan ResNet-50.

Jaringan ResNet-50 yang dilatih dengan parameter yang ditunjukkan pada ***Gambar 10***, Kemudian akan menghasilkan jaringan dengan nilai *Weight* dan *Bias* yang dapat di lihat pada [LAMPIRAN 10]. Dari jaringan ini, kemudian diujikan dengan *dataset Testing* yang sama dengan yang digunakan untuk pengujian menggunakan jaringan VGG-19, dimana mendapatkan hasil rata-rata akurasi pengujian sebesar 0.3447 atau 34.47%. Adapun beberapa sampel pengujian dapat dilihat pada ***Gambar 11***.

Hasil pengujian menggunakan jaringan ResNet-50 ini terpantau masih sangat rendah, sama halnya dengan pengujian menggunakan jaringan VGG-19, meskipun masih tercatat menampilkan performa yang sedikit lebih baik. Adapun detail mengenai perbandingan performa antara kedua jaringan dan hasil analisis nya akan disampaikan pada bagian yang selanjutnya.



Gambar 22 - Beberapa sampel hasil pengujian/klasifikasi citra berdasarkan kelas yang terdaftar dan derajat kepastiannya (dalam bentuk nilai peluang) menggunakan jaringan ResNet-50.

III. Perbandingan Antara VGG-19 & ResNet-50

Setelah berhasil melatih dan menguji performa dari kedua jaringan *neural network*, penguji dapat kemudian membandingkan hasil dari kedua jaringan untuk menentukan jaringan mana yang lebih cocok untuk digunakan dalam memproses *dataset* yang berisi citra MRI pasien tumor otak [LINK 1]. Dari hasil akurasi validasi pada pelatihan jaringan VGG-19 dan ResNet-50 yang ditujukkan pada ***Gambar 8*** dan ***Gambar 10*** serta hasil rerata akurasi pada pengujian kedua jaringan yang telah disampaikan pada bagian sebelumnya, maka dapat dapat dikatakan bahwa VGG-19 memiliki performa keseluruhan yang lebih baik daripada ResNet-50 dalam lingkungan pelatihan yang terkontrol untuk kedua jaringan.

Dari akurasi validasi sampai rerata akurasi pengujian, didapati bahwa VGG-19 memiliki akurasi yang lebih tinggi dibanding ResNet-50. Untuk dapat mengkonfirmasi temuan ini, beberapa perbandingan performa dari VGG-19 dan ResNet-50 untuk citra

medis dari beberapa karya tulis yang dapat dilihat pada ***Tabel 4*** dan ***Tabel 5*** yang dikutip dari [9, 10]. Dari referensi yang dapat dilihat pada ***Tabel 4***, diketahui dari akurasi keseluruhan untuk *dataset* COVID-19 yang dapat dilihat pada kolom *Pooled*, untuk *Batchsize* sebesar 16, ResNet-50 mengungguli VGG-19 sebesar 0.001, atau 0.1%. Sementara untuk *Batchsize* sebesar 32, diketahui bahwa baik untuk VGG-19 dan ResNet-50 memiliki akurasi yang sama sebesar 0.997 atau 99.7% [10].

Network	BS	COVID-19	No pneumonia	Non-COVID-19 pneumonia	Pooled
AlexNet	16	0.986	0.977	0.977	0.980
DenseNet-121	16	1.000	0.995	0.995	0.997
DenseNet-161	16	1.000	0.996	0.996	0.997
DenseNet-169	16	1.000	0.995	0.995	0.997
DenseNet-201	16	1.000	0.996	0.995	0.997
Inception v4	16	0.995	0.985	0.985	0.988
ResNet-18	16	1.000	0.992	0.992	0.995
ResNet-34	16	1.000	0.994	0.994	0.996
ResNet-50	16	1.000	0.995	0.994	0.996
ResNet-101	16	1.000	0.995	0.994	0.996
ResNet-152	16	1.000	0.996	0.996	0.997
SqueezeNet-1.0	16	0.995	0.980	0.980	0.985
SqueezeNet-1.1	16	0.995	0.979	0.978	0.984
VGG-13	16	0.999	0.991	0.991	0.994
VGG-16	16	1.000	0.993	0.993	0.995
VGG-19	16	0.999	0.993	0.993	0.995
AlexNet	32	0.994	0.978	0.978	0.983
DenseNet-121	32	1.000	0.996	0.996	0.997
DenseNet-169	32	1.000	0.997	0.997	0.998
DenseNet-201	32	1.000	0.997	0.997	0.998
Inception v4	32	0.995	0.987	0.987	0.990
ResNet-18	32	1.000	0.993	0.993	0.995
ResNet-34	32	1.000	0.995	0.995	0.997
ResNet-50	32	1.000	0.995	0.995	0.997
ResNet-101	32	1.000	0.996	0.996	0.997
ResNet-152	32	1.000	0.995	0.995	0.997
SqueezeNet-1.0	32	0.996	0.982	0.982	0.987
SqueezeNet-1.1	32	0.998	0.981	0.980	0.986
VGG-13	32	1.000	0.992	0.992	0.995
VGG-16	32	1.000	0.995	0.995	0.997
VGG-19	32	1.000	0.995	0.995	0.997

Tabel 9 - Perbandingan Akurasi dari beberapa metode Deep Learning untuk klasifikasi hasil radiograf pada dada pasien [10].

Dari perbandingan yang disajikan pada ***Tabel 4***, kemudian dapat disimpulkan bahwa baik jaringan VGG-19 dan ResNet-50 memiliki perbdedaan akurasi yang tidak cukup signifikan, mengingat waktu proses nya yang sangat berbeda, dimana VGG-19 memakan jauh lebih banyak waktu. Sedangkan pada ***Tabel 5***, menyatakan secara gamblang bahwa VGG-19 memiliki performa yang lebih baik dari ResNet-50, dengan penggunaan untuk mengklasifikasikan citra X-Ray.

Sehingga, dari hasil percobaan dan referensi yang sudah disebutkan sebelumnya [9, 10], dapat diambil titik tengah bahwa kecenderungan VGG-19 untuk menjadi *performer* yang lebih baik lebih dari ResNet-50. Namun mengingat waktu dan kebutuhan daya komputasi yang cukup besar untuk menjalankan, terlebih melatih jaringan VGG-19, ResNet-50 tetap dapat menjadi alternatif apabila proses pengujian terkendala waktu, atau mendapat *dataset* latih yang ternyata dapat bekerja dengan lebih baik untuk jaringan ResNet-50 (dimana perlu penelitian lanjutan terkait hal ini).

Metrics	VGG-19	ResNet-50	IykeNet
Accuracy (%)	97.3	96.2	93.60
Specificity (NPV) (%)	97.2	96.4	91.66
Precision (%)	96.7	95.3	91.30
Recall (%)	99.2	98.4	92.03

Tabel 10 - Perbandingan Akurasi antara VGG-19, ResNet-50, dan IykeNet untuk klasifikasi Pneumonia dengan menggunakan citra X-Ray [9].

IV. Hasil Analisa Keseluruhan

Pada awal proses analisa, hal pertama yang perlu dianalisis adalah hasil latihan dan akurasi validasi proses pelatihan dari kedua jaringan yang dapat di lihat pada ***Gambar 8*** dan ***Gambar 10***. Dari kedua gambar tersebut, dapat dilihat bahwa untuk konfigurasi pelatihan yang sama, 6 *epoch* dengan masing-masing *epoch* terdiri atas 200 iterasi, didapati bahwa akurasi masih bergerak naik dan belum menunjukkan tanda-tanda akan konvergen ke nilai tertentu (meskipun kenaikan nya sudah tergolong lambat). Namun, yang membedakan adalah jika pada VGG-19, gradien akurasi mulai linier pada akhir *epoch* ke-

2, pada ResNet-50 akurasi mulai linier sejak pertengahan *epoch* pertama. Hal ini mengindikasikan bahwa *progress* yang ditempuh dengan arsitektur ResNet-50 lebih stabil dan linier. Hal ini tentunya dipengaruhi oleh penyelesaian masalah kehilangan gradien dengan menggunakan *shortcut connection* yang terdapat pada *Bottleneck Block* yang merupakan blok pembangun arsitektur ResNet-50.

Dengan demikian arsitektur jaringan residual memiliki kemampuan lebih untuk dapat menambah jumlah *layer* tanpa kehilangan gradien dan tetap menjadi kekonvergenan nilai akurasi nya, yang di sisi lain juga membantu untuk mencegah *overfitting*, yang dengan demikian, meskipun pada *dataset* dan jumlah iterasi yang sama VGG-19 mungkin lebih unggul dari ResNet-50, tetapi ResNet-50 memiliki kapabilitas latih yang lebih tinggi dari VGG-19. Berdasarkan informasi ini, dapat diestimasikan bahwa ResNet-50 dapat bekerja lebih baik dari VGG-19 apabila dilatih dengan *dataset* yang lebih besar atau dengan iterasi yang lebih banyak, dimana pada tahapan tersebut, VGG-19 lebih berisiko untuk mengalami *overfitting* dan kehilangan nilai akurasinya.

Di sisi lain, meskipun nilai akurasi validasi pada tahap pelatihan untuk kedua model arsitektur jaringan tergolong cukup baik dan deterministik, tetapi saat diujikan dengan *dataset Testing*, didapati akurasi pengujian cukup buruk di angka 40,86% untuk VGG-19 dan 34,47% untuk ResNet-50. Hal ini diperkirakan dapat terjadi karena citra MRI yang digunakan, meskipun sudah cukup mewakili keseluruhan kondisi yang memungkinkan dari pasien yang menderita tumor otak, tetapi membuat rancu dalam proses pengenalan fitur yang diterapkan pada *neural network*.

Neural network dapat mengenali sebuah citra dengan mengekstrak fitur dari sebuah citra dan membandingkan nya dengan contoh berdasarkan masing-masing kelas. Pada citra MRI Tumor Otak, fitur dari tumor otak itu sendiri berbentuk gumpalan berwarna cerah yang berbentuk acak, sehingga akan sulit untuk menentukan jenis tumor berdasarkan bentuknya, cara paling masuk akal untuk mengidentifikasi jenis tumor nya adalah dengan memanfaatkan lokasi dimana tumor tersebut berada, mengingat jenis tumor yang didaftarkan sebagai kelas klasifikasi memang dibedakan berdasarkan tempat tumbuhnya tumor tersebut (glioma pada sel glial, adenoma pituitary pada kelenjar pituitary, dan meningioma pada *arachnoid cap cells*).

Namun yang menjadi masalah adalah, dalam *dataset* ini [LINK 1], citra diambil dari berbagai sisi, sehingga identifikasi lokasi dari tumor bisa menjadi kacau karena adanya citra yang diambil dari sisi lain. Jika kita melihat pada referensi [9, 10], dapat diketahui bahwa kedua referensi tersebut menggunakan citra X-Ray bagian dada, yang sudah jelas hanya dapat diambil dari bagian depan, sehingga identifikasi lokasi fitur dapat dimanfaatkan dengan maksimal untuk menunjang proses klasifikasi.

Demikian adalah alasan mengapa akurasi pengujian didapati masih cukup rendah, untuk dapat menghasilkan akurasi yang tinggi dan deterministik, baiknya untuk menggunakan *dataset* dengan orientasi yang seragam, sehingga jaringan dapat berfokus pada fitur nya secara langsung, yang dalam kasus ini adalah tumor otak, dan tidak dibingungkan oleh orientasi citra yang berubah-ubah.

BAB V
KESIMPULAN

Dari hasil pelatihan, pengujian, serta analisis yang telah dilakukan untuk jaringan *Neural Network* VGG-19 dan ResNet-50 untuk *dataset* mengenai citra MRI dari pasien tumor otak [LINK 1], maka dapat disimpulkan bahwa dalam hal performa dasar (dengan perbandingan pengujian di lingkungan yang sama) VGG-19 dapat mengungguli ResNet-50 dalam akurasi klasifikasinya. Namun dapat dipertimbangkan kembali waktu proses dan pelatihan nya, karena VGG-19 memakan waktu lebih dari dua kali lebih lama dari ResNet-50 dengan kenaikan akurasi yang tidak terlalu signifikan.

Di sisi lain, ResNet-50 dapat bekerja dengan lebih baik apabila *dataset* yang digunakan lebih banyak, atau menggunakan sesi pelatihan yang lebih lama. Karena *shortcut connection* nya yang membuat jaringan ResNet-50 tidak rentan terhadap masalah *vanishing gradient* dan membutuhkan proses yang lebih banyak sampai akhirnya *overfitting* jika dibandingkan dengan jaringan VGG-19.

Sementara itu, penyebab dari kurangnya akurasi saat sesi pengujian dapat disebabkan oleh kondisi pelatihan yang belum cukup melatih jaringan sampai potensi maksimal nya. Atau dapat pula karena orientasi citra pada *dataset* yang berbeda-beda, sehingga proses klasifikasi berdasarkan lokasi tumor (fitur pada citra) menjadi terganggu, yang pada akhirnya menyebabkan nilai akurasi bacaan yang rendah. Sehingga untuk dapat menghasilkan akurasi klasifikasi yang lebih tinggi, akan lebih baik apabila citra yang digunakan merupakan hasil rekaman pada orientasi yang sama untuk semua citra yang akan digunakan dalam proses pelatihan dan proses klasifikasi atau pengujian nya itu sendiri.

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LAMPIRAN

LAMPIRAN 1 – Konfigurasi Layer VGG-19

1	imageinput 224x224x3 images with 'zeroc...	Image Input	224×224×3	-
2	conv_1 64 3x3x3 convolutions with stri...	Convolution	224×224×64	Weights 3×3×3×64 Bias 1×1×64
3	relu_1 ReLU	ReLU	224×224×64	-
4	conv_2 64 3x3x64 convolutions with st...	Convolution	224×224×64	Weights 3×3×64×64 Bias 1×1×64
5	relu_2 ReLU	ReLU	224×224×64	-
6	maxpool_1 2x2 max pooling with stride [2 ...	Max Pooling	112×112×64	-
7	conv_3 128 3x3x64 convolutions with ...	Convolution	112×112×128	Weights 3×3×64×128 Bias 1×1×128
8	relu_3 ReLU	ReLU	112×112×128	-
9	conv_4 128 3x3x128 convolutions with...	Convolution	112×112×128	Weights 3×3×128×128 Bias 1×1×128
10	relu_4 ReLU	ReLU	112×112×128	-
11	maxpool_2 2x2 max pooling with stride [2 ...	Max Pooling	56×56×128	-
12	conv_5 256 3x3x128 convolutions with...	Convolution	56×56×256	Weights 3×3×128×256 Bias 1×1×256
13	relu_5 ReLU	ReLU	56×56×256	-
14	conv_6 256 3x3x256 convolutions with...	Convolution	56×56×256	Weights 3×3×256×256 Bias 1×1×256
15	relu_6 ReLU	ReLU	56×56×256	-
16	conv_7 256 3x3x256 convolutions with...	Convolution	56×56×256	Weights 3×3×256×256 Bias 1×1×256
17	relu_7 ReLU	ReLU	56×56×256	-
18	conv_8 256 3x3x256 convolutions with...	Convolution	56×56×256	Weights 3×3×256×256 Bias 1×1×256
19	relu_8 ReLU	ReLU	56×56×256	-
20	maxpool_3 2x2 max pooling with stride [2 ...	Max Pooling	28×28×256	-

21	conv_9 512 3x3x256 convolutions with…	Convolution	28×28×512	Weights 3×3×256×512 Bias 1×1×512
22	relu_9 ReLU	ReLU	28×28×512	-
23	conv_10 512 3x3x512 convolutions with…	Convolution	28×28×512	Weights 3×3×512×512 Bias 1×1×512
24	relu_10 ReLU	ReLU	28×28×512	-
25	conv_11 512 3x3x512 convolutions with…	Convolution	28×28×512	Weights 3×3×512×512 Bias 1×1×512
26	relu_11 ReLU	ReLU	28×28×512	-
27	conv_12 512 3x3x512 convolutions with…	Convolution	28×28×512	Weights 3×3×512×512 Bias 1×1×512
28	relu_12 ReLU	ReLU	28×28×512	-
29	maxpool_4 2x2 max pooling with stride [2 …	Max Pooling	14×14×512	-
30	conv_13 512 3x3x512 convolutions with…	Convolution	14×14×512	Weights 3×3×512×512 Bias 1×1×512
31	relu_13 ReLU	ReLU	14×14×512	-
32	conv_14 512 3x3x512 convolutions with…	Convolution	14×14×512	Weights 3×3×512×512 Bias 1×1×512
33	relu_14 ReLU	ReLU	14×14×512	-
34	conv_15 512 3x3x512 convolutions with…	Convolution	14×14×512	Weights 3×3×512×512 Bias 1×1×512
35	relu_15 ReLU	ReLU	14×14×512	-
36	conv_16 512 3x3x512 convolutions with…	Convolution	14×14×512	Weights 3×3×512×512 Bias 1×1×512
37	relu_16 ReLU	ReLU	14×14×512	-
38	maxpool_5 2x2 max pooling with stride [2 …	Max Pooling	7×7×512	-
39	fc_1 4096 fully connected layer	Fully Connected	1×1×4096	Weights 4096×25088 Bias 4096×1
40	relu_17 ReLU	ReLU	1×1×4096	-

41	dropout_1 50% dropout	Dropout	1×1×4096	-
42	fc_2 4096 fully conne…	Fully Connected	1×1×4096	Weights 4096×4096 Bias 4096×1
43	relu_18 ReLU	ReLU	1×1×4096	-
44	dropout_2 50% dropout	Dropout	1×1×4096	-
45	fc_3 4 fully connecte…	Fully Connected	1×1×4	Weights 4×4096 Bias 4×1
46	softmax softmax	Softmax	1×1×4	-
47	classoutput crossentropyex	Classification Output	-	-

LAMPIRAN 2 – Konfigurasi Layer ResNet-50

1	input_1 224x224x3 ima...	Image Input	224×224×3	-
2	conv1 64 7x7x3 convol...	Convolution	112×112×64	Weights 7×7×3×64 Bias 1×1×64
3	bn_conv1 Batch normaliza...	Batch Normalization	112×112×64	Offset 1×1×64 Scale 1×1×64
4	activation_1_... ReLU	ReLU	112×112×64	-
5	max_pooling... 3x3 max poolin...	Max Pooling	55×55×64	-
6	res2a_branc... 64 1x1x64 conv...	Convolution	55×55×64	Weights 1×1×64×64 Bias 1×1×64
7	bn2a_branch2a Batch normaliza...	Batch Normalization	55×55×64	Offset 1×1×64 Scale 1×1×64
8	activation_2_... ReLU	ReLU	55×55×64	-
9	res2a_branc... 64 3x3x64 conv...	Convolution	55×55×64	Weights 3×3×64×64 Bias 1×1×64
10	bn2a_branch2b Batch normaliza...	Batch Normalization	55×55×64	Offset 1×1×64 Scale 1×1×64
11	activation_3_... ReLU	ReLU	55×55×64	-
12	res2a_branc... 256 1x1x64 con...	Convolution	55×55×256	Weights 1×1×64×256 Bias 1×1×256
13	bn2a_branch2c Batch normaliza...	Batch Normalization	55×55×256	Offset 1×1×256 Scale 1×1×256
14	res2a_branch1 256 1x1x64 con...	Convolution	55×55×256	Weights 1×1×64×256 Bias 1×1×256
15	bn2a_branch1 Batch normaliza...	Batch Normalization	55×55×256	Offset 1×1×256 Scale 1×1×256
16	add_1 Element-wise a...	Addition	55×55×256	-
17	activation_4_... ReLU	ReLU	55×55×256	-
18	res2b_branc... 64 1x1x256 con...	Convolution	55×55×64	Weights 1×1×256×64 Bias 1×1×64
19	bn2b_branch2a Batch normaliza...	Batch Normalization	55×55×64	Offset 1×1×64 Scale 1×1×64
20	activation_5_... ReLU	ReLU	55×55×64	-

21	res2b_branc… 64 3x3x64 conv…	Convolution	55×55×64	Weights 3×3×64×64 Bias 1×1×64
22	bn2b_branch2b Batch normaliza…	Batch Normalization	55×55×64	Offset 1×1×64 Scale 1×1×64
23	activation_6_… ReLU	ReLU	55×55×64	-
24	res2b_branc… 256 1x1x64 con…	Convolution	55×55×256	Weights 1×1×64×256 Bias 1×1×256
25	bn2b_branch2c Batch normaliza…	Batch Normalization	55×55×256	Offset 1×1×256 Scale 1×1×256
26	add_2 Element-wise a…	Addition	55×55×256	-
27	activation_7_… ReLU	ReLU	55×55×256	-
28	res2c_branc… 64 1x1x256 con…	Convolution	55×55×64	Weights 1×1×256×64 Bias 1×1×64
29	bn2c_branch2a Batch normaliza…	Batch Normalization	55×55×64	Offset 1×1×64 Scale 1×1×64
30	activation_8_… ReLU	ReLU	55×55×64	-
31	res2c_branc… 64 3x3x64 conv…	Convolution	55×55×64	Weights 3×3×64×64 Bias 1×1×64
32	bn2c_branch2b Batch normaliza…	Batch Normalization	55×55×64	Offset 1×1×64 Scale 1×1×64
33	activation_9_… ReLU	ReLU	55×55×64	-
34	res2c_branc… 256 1x1x64 con…	Convolution	55×55×256	Weights 1×1×64×256 Bias 1×1×256
35	bn2c_branch2c Batch normaliza…	Batch Normalization	55×55×256	Offset 1×1×256 Scale 1×1×256
36	add_3 Element-wise a…	Addition	55×55×256	-
37	activation_10… ReLU	ReLU	55×55×256	-
38	res3a_branc… 128 1x1x256 co…	Convolution	28×28×128	Weights 1×1×256×128 Bias 1×1×128
39	res3a_branch1 512 1x1x256 co…	Convolution	28×28×512	Weights 1×1×256×512 Bias 1×1×512
40	bn3a_branch1 Batch normaliza…	Batch Normalization	28×28×512	Offset 1×1×512 Scale 1×1×512

41	bn3a_branch2a Batch normaliza…	Batch Normalization	28×28×128	Offset 1×1×128 Scale 1×1×128
42	activation_11… ReLU	ReLU	28×28×128	-
43	res3a_branc… 128 3x3x128 co…	Convolution	28×28×128	Weights 3×3×128×128 Bias 1×1×128
44	bn3a_branch2b Batch normaliza…	Batch Normalization	28×28×128	Offset 1×1×128 Scale 1×1×128
45	activation_12… ReLU	ReLU	28×28×128	-
46	res3a_branc… 512 1x1x128 co…	Convolution	28×28×512	Weights 1×1×128×512 Bias 1×1×512
47	bn3a_branch2c Batch normaliza…	Batch Normalization	28×28×512	Offset 1×1×512 Scale 1×1×512
48	add_4 Element-wise a…	Addition	28×28×512	-
49	activation_13… ReLU	ReLU	28×28×512	-
50	res3b_branc… 128 1x1x512 co…	Convolution	28×28×128	Weights 1×1×512×128 Bias 1×1×128
51	bn3b_branch2a Batch normaliza…	Batch Normalization	28×28×128	Offset 1×1×128 Scale 1×1×128
52	activation_14… ReLU	ReLU	28×28×128	-
53	res3b_branc… 128 3x3x128 co…	Convolution	28×28×128	Weights 3×3×128×128 Bias 1×1×128
54	bn3b_branch2b Batch normaliza…	Batch Normalization	28×28×128	Offset 1×1×128 Scale 1×1×128
55	activation_15… ReLU	ReLU	28×28×128	-
56	res3b_branc… 512 1x1x128 co…	Convolution	28×28×512	Weights 1×1×128×512 Bias 1×1×512
57	bn3b_branch2c Batch normaliza…	Batch Normalization	28×28×512	Offset 1×1×512 Scale 1×1×512
58	add_5 Element-wise a…	Addition	28×28×512	-
59	activation_16… ReLU	ReLU	28×28×512	-
60	res3c_branc… 128 1x1x512 co…	Convolution	28×28×128	Weights 1×1×512×128 Bias 1×1×128

61	bn3c_branch2a Batch normaliza…	Batch Normalization	28×28×128	Offset 1×1×128 Scale 1×1×128
62	activation_17… ReLU	ReLU	28×28×128	-
63	res3c_branc… 128 3x3x128 co…	Convolution	28×28×128	Weights 3×3×128×128 Bias 1×1×128
64	bn3c_branch2b Batch normaliza…	Batch Normalization	28×28×128	Offset 1×1×128 Scale 1×1×128
65	activation_18… ReLU	ReLU	28×28×128	-
66	res3c_branc… 512 1x1x128 co…	Convolution	28×28×512	Weights 1×1×128×512 Bias 1×1×512
67	bn3c_branch2c Batch normaliza…	Batch Normalization	28×28×512	Offset 1×1×512 Scale 1×1×512
68	add_6 Element-wise a…	Addition	28×28×512	-
69	activation_19… ReLU	ReLU	28×28×512	-
70	res3d_branc… 128 1x1x512 co…	Convolution	28×28×128	Weights 1×1×512×128 Bias 1×1×128
71	bn3d_branch2a Batch normaliza…	Batch Normalization	28×28×128	Offset 1×1×128 Scale 1×1×128
72	activation_20… ReLU	ReLU	28×28×128	-
73	res3d_branc… 128 3x3x128 co…	Convolution	28×28×128	Weights 3×3×128×128 Bias 1×1×128
74	bn3d_branch2b Batch normaliza…	Batch Normalization	28×28×128	Offset 1×1×128 Scale 1×1×128
75	activation_21… ReLU	ReLU	28×28×128	-
76	res3d_branc… 512 1x1x128 co…	Convolution	28×28×512	Weights 1×1×128×512 Bias 1×1×512
77	bn3d_branch2c Batch normaliza…	Batch Normalization	28×28×512	Offset 1×1×512 Scale 1×1×512
78	add_7 Element-wise a…	Addition	28×28×512	-
79	activation_22… ReLU	ReLU	28×28×512	-
80	res4a_branch1 1024 1x1x512 c…	Convolution	14×14×1024	Weigh… 1×1×512×10… Bias 1×1×1024

81	bn4a_branch1 Batch normaliza…	Batch Normalization	14×14×1024	Offset 1×1×1024 Scale 1×1×1024
82	res4a_branc… 256 1x1x512 co…	Convolution	14×14×256	Weights 1×1×512×256 Bias 1×1×256
83	bn4a_branch2a Batch normaliza…	Batch Normalization	14×14×256	Offset 1×1×256 Scale 1×1×256
84	activation_23… ReLU	ReLU	14×14×256	-
85	res4a_branc… 256 3x3x256 co…	Convolution	14×14×256	Weights 3×3×256×256 Bias 1×1×256
86	bn4a_branch2b Batch normaliza…	Batch Normalization	14×14×256	Offset 1×1×256 Scale 1×1×256
87	activation_24… ReLU	ReLU	14×14×256	-
88	res4a_branc… 1024 1x1x256 c…	Convolution	14×14×1024	Weigh… 1×1×256×10… Bias 1×1×1024
89	bn4a_branch2c Batch normaliza…	Batch Normalization	14×14×1024	Offset 1×1×1024 Scale 1×1×1024
90	add_8 Element-wise a…	Addition	14×14×1024	-
91	activation_25… ReLU	ReLU	14×14×1024	-
92	res4b_branc… 256 1x1x1024 c…	Convolution	14×14×256	Weigh… 1×1×1024×2… Bias 1×1×256
93	bn4b_branch2a Batch normaliza…	Batch Normalization	14×14×256	Offset 1×1×256 Scale 1×1×256
94	activation_26… ReLU	ReLU	14×14×256	-
95	res4b_branc… 256 3x3x256 co…	Convolution	14×14×256	Weights 3×3×256×256 Bias 1×1×256
96	bn4b_branch2b Batch normaliza…	Batch Normalization	14×14×256	Offset 1×1×256 Scale 1×1×256
97	activation_27… ReLU	ReLU	14×14×256	-
98	res4b_branc… 1024 1x1x256 c…	Convolution	14×14×1024	Weigh… 1×1×256×10… Bias 1×1×1024
99	bn4b_branch2c Batch normaliza…	Batch Normalization	14×14×1024	Offset 1×1×1024 Scale 1×1×1024
100	add_9 Element-wise a…	Addition	14×14×1024	-

101	activation_28… ReLU	ReLU	14×14×1024	-
102	res4c_branc… 256 1x1x1024 c…	Convolution	14×14×256	Weigh… 1×1×1024×2… Bias 1×1×256
103	bn4c_branch2a Batch normaliza…	Batch Normalization	14×14×256	Offset 1×1×256 Scale 1×1×256
104	activation_29… ReLU	ReLU	14×14×256	-
105	res4c_branc… 256 3x3x256 co…	Convolution	14×14×256	Weights 3×3×256×256 Bias 1×1×256
106	bn4c_branch2b Batch normaliza…	Batch Normalization	14×14×256	Offset 1×1×256 Scale 1×1×256
107	activation_30… ReLU	ReLU	14×14×256	-
108	res4c_branc… 1024 1x1x256 c…	Convolution	14×14×1024	Weigh… 1×1×256×10… Bias 1×1×1024
109	bn4c_branch2c Batch normaliza…	Batch Normalization	14×14×1024	Offset 1×1×1024 Scale 1×1×1024
110	add_10 Element-wise a…	Addition	14×14×1024	-
111	activation_31… ReLU	ReLU	14×14×1024	-
112	res4d_branc… 256 1x1x1024 c…	Convolution	14×14×256	Weigh… 1×1×1024×2… Bias 1×1×256
113	bn4d_branch2a Batch normaliza…	Batch Normalization	14×14×256	Offset 1×1×256 Scale 1×1×256
114	activation_32… ReLU	ReLU	14×14×256	-
115	res4d_branc… 256 3x3x256 co…	Convolution	14×14×256	Weights 3×3×256×256 Bias 1×1×256
116	bn4d_branch2b Batch normaliza…	Batch Normalization	14×14×256	Offset 1×1×256 Scale 1×1×256
117	activation_33… ReLU	ReLU	14×14×256	-
118	res4d_branc… 1024 1x1x256 c…	Convolution	14×14×1024	Weigh… 1×1×256×10… Bias 1×1×1024
119	bn4d_branch2c Batch normaliza…	Batch Normalization	14×14×1024	Offset 1×1×1024 Scale 1×1×1024
120	add_11 Element-wise a…	Addition	14×14×1024	-

121	activation_34… ReLU	ReLU	14×14×1024	-
122	res4e_branc… 256 1x1x1024 c…	Convolution	14×14×256	Weigh… 1×1×1024×2… Bias 1×1×256
123	bn4e_branch2a Batch normaliza…	Batch Normalization	14×14×256	Offset 1×1×256 Scale 1×1×256
124	activation_35… ReLU	ReLU	14×14×256	-
125	res4e_branc… 256 3x3x256 co…	Convolution	14×14×256	Weights 3×3×256×256 Bias 1×1×256
126	bn4e_branch2b Batch normaliza…	Batch Normalization	14×14×256	Offset 1×1×256 Scale 1×1×256
127	activation_36… ReLU	ReLU	14×14×256	-
128	res4e_branc… 1024 1x1x256 c…	Convolution	14×14×1024	Weigh… 1×1×256×10… Bias 1×1×1024
129	bn4e_branch2c Batch normaliza…	Batch Normalization	14×14×1024	Offset 1×1×1024 Scale 1×1×1024
130	add_12 Element-wise a…	Addition	14×14×1024	-
131	activation_37… ReLU	ReLU	14×14×1024	-
132	res4f_branch2a 256 1x1x1024 c…	Convolution	14×14×256	Weigh… 1×1×1024×2… Bias 1×1×256
133	bn4f_branch2a Batch normaliza…	Batch Normalization	14×14×256	Offset 1×1×256 Scale 1×1×256
134	activation_38… ReLU	ReLU	14×14×256	-
135	res4f_branch2b 256 3x3x256 co…	Convolution	14×14×256	Weights 3×3×256×256 Bias 1×1×256
136	bn4f_branch2b Batch normaliza…	Batch Normalization	14×14×256	Offset 1×1×256 Scale 1×1×256
137	activation_39… ReLU	ReLU	14×14×256	-
138	res4f_branch2c 1024 1x1x256 c…	Convolution	14×14×1024	Weigh… 1×1×256×10… Bias 1×1×1024
139	bn4f_branch2c Batch normaliza…	Batch Normalization	14×14×1024	Offset 1×1×1024 Scale 1×1×1024
140	add_13 Element-wise a…	Addition	14×14×1024	-

141	activation_40… ReLU	ReLU	14×14×1024	-
142	res5a_branc… 512 1x1x1024 c…	Convolution	7×7×512	Weigh… 1×1×1024×5… Bias 1×1×512
143	bn5a_branch2a Batch normaliza…	Batch Normalization	7×7×512	Offset 1×1×512 Scale 1×1×512
144	activation_41… ReLU	ReLU	7×7×512	-
145	res5a_branc… 512 3x3x512 co…	Convolution	7×7×512	Weights 3×3×512×512 Bias 1×1×512
146	bn5a_branch2b Batch normaliza…	Batch Normalization	7×7×512	Offset 1×1×512 Scale 1×1×512
147	activation_42… ReLU	ReLU	7×7×512	-
148	res5a_branc… 2048 1x1x512 c…	Convolution	7×7×2048	Weigh… 1×1×512×20… Bias 1×1×2048
149	res5a_branch1 2048 1x1x1024 …	Convolution	7×7×2048	Weigh… 1×1×1024×20… Bias 1×1×2048
150	bn5a_branch2c Batch normaliza…	Batch Normalization	7×7×2048	Offset 1×1×2048 Scale 1×1×2048
151	bn5a_branch1 Batch normaliza…	Batch Normalization	7×7×2048	Offset 1×1×2048 Scale 1×1×2048
152	add_14 Element-wise a…	Addition	7×7×2048	-
153	activation_43… ReLU	ReLU	7×7×2048	-
154	res5b_branc… 512 1x1x2048 c…	Convolution	7×7×512	Weigh… 1×1×2048×5… Bias 1×1×512
155	bn5b_branch2a Batch normaliza…	Batch Normalization	7×7×512	Offset 1×1×512 Scale 1×1×512
156	activation_44… ReLU	ReLU	7×7×512	-
157	res5b_branc… 512 3x3x512 co…	Convolution	7×7×512	Weights 3×3×512×512 Bias 1×1×512
158	bn5b_branch2b Batch normaliza…	Batch Normalization	7×7×512	Offset 1×1×512 Scale 1×1×512
159	activation_45… ReLU	ReLU	7×7×512	-
160	res5b_branc… 2048 1x1x512 c…	Convolution	7×7×2048	Weigh… 1×1×512×20… Bias 1×1×2048

161	bn5b_branch2c Batch normaliza…	Batch Normalization	7×7×2048	Offset 1×1×2048 Scale 1×1×2048
162	add_15 Element-wise a…	Addition	7×7×2048	-
163	activation_46… ReLU	ReLU	7×7×2048	-
164	res5c_branc… 512 1x1x2048 c…	Convolution	7×7×512	Weigh… 1×1×2048×5… Bias 1×1×512
165	bn5c_branch2a Batch normaliza…	Batch Normalization	7×7×512	Offset 1×1×512 Scale 1×1×512
166	activation_47… ReLU	ReLU	7×7×512	-
167	res5c_branc… 512 3x3x512 co…	Convolution	7×7×512	Weights 3×3×512×512 Bias 1×1×512
168	bn5c_branch2b Batch normaliza…	Batch Normalization	7×7×512	Offset 1×1×512 Scale 1×1×512
169	activation_48… ReLU	ReLU	7×7×512	-
170	res5c_branc… 2048 1x1x512 c…	Convolution	7×7×2048	Weigh… 1×1×512×20… Bias 1×1×2048
171	bn5c_branch2c Batch normaliza…	Batch Normalization	7×7×2048	Offset 1×1×2048 Scale 1×1×2048
172	add_16 Element-wise a…	Addition	7×7×2048	-
173	activation_49… ReLU	ReLU	7×7×2048	-
174	avg_pool 7x7 average po…	Average Pooling	1×1×2048	-
175	fc 4 fully connecte…	Fully Connected	1×1×4	Weights 4×2048 Bias 4×1
176	fc1000_soft… softmax	Softmax	1×1×4	-
177	classoutput crossentropyex	Classification Output	-	-

LAMPIRAN 3 – *Source Code Network* VGG-19

```
layers = [
    imageInputLayer([224 224 3],"Name","imageinput")
    convolution2dLayer([3 3],64,"Name","conv_1","Padding",[1 1 1 1])
    reluLayer("Name","relu_1")
    convolution2dLayer([3 3],64,"Name","conv_2","Padding",[1 1 1 1])
    reluLayer("Name","relu_2")
    maxPooling2dLayer([2 2],"Name","maxpool_1","Stride",[2 2])
    convolution2dLayer([3 3],128,"Name","conv_3","Padding",[1 1 1 1])
    reluLayer("Name","relu_3")
    convolution2dLayer([3 3],128,"Name","conv_4","Padding",[1 1 1 1])
    reluLayer("Name","relu_4")
    maxPooling2dLayer([2 2],"Name","maxpool_2","Stride",[2 2])
    convolution2dLayer([3 3],256,"Name","conv_5","Padding",[1 1 1 1])
    reluLayer("Name","relu_5")
    convolution2dLayer([3 3],256,"Name","conv_6","Padding",[1 1 1 1])
    reluLayer("Name","relu_6")
    convolution2dLayer([3 3],256,"Name","conv_7","Padding",[1 1 1 1])
    reluLayer("Name","relu_7")
    convolution2dLayer([3 3],256,"Name","conv_8","Padding",[1 1 1 1])
    reluLayer("Name","relu_8")
    maxPooling2dLayer([2 2],"Name","maxpool_3","Stride",[2 2])
    convolution2dLayer([3 3],512,"Name","conv_9","Padding",[1 1 1 1])
    reluLayer("Name","relu_9")
    convolution2dLayer([3 3],512,"Name","conv_10","Padding",[1 1 1 1])
    reluLayer("Name","relu_10")
    convolution2dLayer([3 3],512,"Name","conv_11","Padding",[1 1 1 1])
    reluLayer("Name","relu_11")
    convolution2dLayer([3 3],512,"Name","conv_12","Padding",[1 1 1 1])
    reluLayer("Name","relu_12")
    maxPooling2dLayer([2 2],"Name","maxpool_4","Stride",[2 2])
    convolution2dLayer([3 3],512,"Name","conv_13","Padding",[1 1 1 1])
    reluLayer("Name","relu_13")
    convolution2dLayer([3 3],512,"Name","conv_14","Padding",[1 1 1 1])
    reluLayer("Name","relu_14")
    convolution2dLayer([3 3],512,"Name","conv_15","Padding",[1 1 1 1])
    reluLayer("Name","relu_15")
    convolution2dLayer([3 3],512,"Name","conv_16","Padding",[1 1 1 1])
    reluLayer("Name","relu_16")
    maxPooling2dLayer([2 2],"Name","maxpool_5","Stride",[2 2])
    fullyConnectedLayer(4096,"Name","fc_1")
    reluLayer("Name","relu_17")
    dropoutLayer(0.5,"Name","dropout_1")
    fullyConnectedLayer(4096,"Name","fc_2")
    reluLayer("Name","relu_18")
    dropoutLayer(0.5,"Name","dropout_2")
```

```
    fullyConnectedLayer(1000,"Name","fc_3")
    softmaxLayer("Name","softmax")
    classificationLayer("Name","classoutput")];

plot(layerGraph(layers));
```

LAMPIRAN 4 – *Source Code Training* VGG-19

```
addpath('C:\Users\LENOVO\OneDrive\Desktop\Materi Kuliah\Semester 7\Teknik
Neurofuzi\Tugas\Deep Learning Project\Program Files\VGG19');
unzip('Training.zip');
imds =
imageDatastore('Training','IncludeSubfolders',true,'LabelSource','foldernames')
;
[imdsTrain,imdsValidation] = splitEachLabel(imds,0.7,'randomized');


augimdsTrain = augmentedImageDatastore([224 224],imdsTrain);
augimdsValidation = augmentedImageDatastore([224 224],imdsValidation);


options = trainingOptions('sgdm', ...
    'MiniBatchSize',10, ...
    'MaxEpochs',6, ...
    'Shuffle','every-epoch', ...
    'InitialLearnRate',1e-4, ...
    'ValidationData',augimdsValidation, ...
    'ValidationFrequency',6, ...
    'Verbose',false, ...
    'Plots','training-progress');


netTransfer = trainNetwork(augimdsTrain,layers_1,options);
```

LAMPIRAN 5 – *Source Code Testing* VGG-19

```
addpath('C:\Users\LENOVO\OneDrive\Desktop\Materi Kuliah\Semester 7\Teknik
Neurofuzi\Tugas\Deep Learning Project\Program Files\VGG19');
unzip('Testing.zip');
imds =
imageDatastore('Testing','IncludeSubfolders',true,'LabelSource','foldernames');
imdsValidation = imds;


augimdsValidation = augmentedImageDatastore([224 224], imdsValidation);


[YPred,probs] = classify(netTransfer,augimdsValidation);
accuracy = mean(YPred == imdsValidation.Labels)


idx = randperm(numel(augimdsValidation.Files),9);
figure
for i = 1:9
    subplot(3,3,i)
    I = readimage(imdsValidation,idx(i));
    imshow(I)
    label = YPred(idx(i));
    title(string(label) + ", " + num2str(100*max(probs(idx(i),:)),3) + "%");
end
```

LAMPIRAN 6 – *Source Code Network* ResNet-50

```
lgraph = layerGraph();

tempLayers = [
    imageInputLayer([224 224 3],"Name","input_1")
    convolution2dLayer([7 7],64,"Name","conv1","Padding",[3 3 3 3],"Stride",[2
2])
    batchNormalizationLayer("Name","bn_conv1","Epsilon",0.001)
    reluLayer("Name","activation_1_relu")
    maxPooling2dLayer([3 3],"Name","max_pooling2d_1","Stride",[2 2])];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],64,"Name","res2a_branch2a")
    batchNormalizationLayer("Name","bn2a_branch2a","Epsilon",0.001)
    reluLayer("Name","activation_2_relu")
    convolution2dLayer([3 3],64,"Name","res2a_branch2b","Padding","same")
    batchNormalizationLayer("Name","bn2a_branch2b","Epsilon",0.001)
    reluLayer("Name","activation_3_relu")
    convolution2dLayer([1 1],256,"Name","res2a_branch2c")
    batchNormalizationLayer("Name","bn2a_branch2c","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],256,"Name","res2a_branch1")
    batchNormalizationLayer("Name","bn2a_branch1","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    additionLayer(2,"Name","add_1")
    reluLayer("Name","activation_4_relu")];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],64,"Name","res2b_branch2a")
    batchNormalizationLayer("Name","bn2b_branch2a","Epsilon",0.001)
    reluLayer("Name","activation_5_relu")
    convolution2dLayer([3 3],64,"Name","res2b_branch2b","Padding","same")
    batchNormalizationLayer("Name","bn2b_branch2b","Epsilon",0.001)
    reluLayer("Name","activation_6_relu")
    convolution2dLayer([1 1],256,"Name","res2b_branch2c")
    batchNormalizationLayer("Name","bn2b_branch2c","Epsilon",0.001)];
```

```
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    additionLayer(2,"Name","add_2")
    reluLayer("Name","activation_7_relu")];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],64,"Name","res2c_branch2a")
    batchNormalizationLayer("Name","bn2c_branch2a","Epsilon",0.001)
    reluLayer("Name","activation_8_relu")
    convolution2dLayer([3 3],64,"Name","res2c_branch2b","Padding","same")
    batchNormalizationLayer("Name","bn2c_branch2b","Epsilon",0.001)
    reluLayer("Name","activation_9_relu")
    convolution2dLayer([1 1],256,"Name","res2c_branch2c")
    batchNormalizationLayer("Name","bn2c_branch2c","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    additionLayer(2,"Name","add_3")
    reluLayer("Name","activation_10_relu")];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],128,"Name","res3a_branch2a","Stride",[2 2])
    batchNormalizationLayer("Name","bn3a_branch2a","Epsilon",0.001)
    reluLayer("Name","activation_11_relu")
    convolution2dLayer([3 3],128,"Name","res3a_branch2b","Padding","same")
    batchNormalizationLayer("Name","bn3a_branch2b","Epsilon",0.001)
    reluLayer("Name","activation_12_relu")
    convolution2dLayer([1 1],512,"Name","res3a_branch2c")
    batchNormalizationLayer("Name","bn3a_branch2c","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],512,"Name","res3a_branch1","Stride",[2 2])
    batchNormalizationLayer("Name","bn3a_branch1","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    additionLayer(2,"Name","add_4")
    reluLayer("Name","activation_13_relu")];
```

```
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],128,"Name","res3b_branch2a")
    batchNormalizationLayer("Name","bn3b_branch2a","Epsilon",0.001)
    reluLayer("Name","activation_14_relu")
    convolution2dLayer([3 3],128,"Name","res3b_branch2b","Padding","same")
    batchNormalizationLayer("Name","bn3b_branch2b","Epsilon",0.001)
    reluLayer("Name","activation_15_relu")
    convolution2dLayer([1 1],512,"Name","res3b_branch2c")
    batchNormalizationLayer("Name","bn3b_branch2c","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    additionLayer(2,"Name","add_5")
    reluLayer("Name","activation_16_relu")];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],128,"Name","res3c_branch2a")
    batchNormalizationLayer("Name","bn3c_branch2a","Epsilon",0.001)
    reluLayer("Name","activation_17_relu")
    convolution2dLayer([3 3],128,"Name","res3c_branch2b","Padding","same")
    batchNormalizationLayer("Name","bn3c_branch2b","Epsilon",0.001)
    reluLayer("Name","activation_18_relu")
    convolution2dLayer([1 1],512,"Name","res3c_branch2c")
    batchNormalizationLayer("Name","bn3c_branch2c","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    additionLayer(2,"Name","add_6")
    reluLayer("Name","activation_19_relu")];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],128,"Name","res3d_branch2a")
    batchNormalizationLayer("Name","bn3d_branch2a","Epsilon",0.001)
    reluLayer("Name","activation_20_relu")
    convolution2dLayer([3 3],128,"Name","res3d_branch2b","Padding","same")
    batchNormalizationLayer("Name","bn3d_branch2b","Epsilon",0.001)
    reluLayer("Name","activation_21_relu")
    convolution2dLayer([1 1],512,"Name","res3d_branch2c")
    batchNormalizationLayer("Name","bn3d_branch2c","Epsilon",0.001)];
```

```
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    additionLayer(2,"Name","add_7")
    reluLayer("Name","activation_22_relu")];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],1024,"Name","res4a_branch1","Stride",[2 2])
    batchNormalizationLayer("Name","bn4a_branch1","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],256,"Name","res4a_branch2a","Stride",[2 2])
    batchNormalizationLayer("Name","bn4a_branch2a","Epsilon",0.001)
    reluLayer("Name","activation_23_relu")
    convolution2dLayer([3 3],256,"Name","res4a_branch2b","Padding","same")
    batchNormalizationLayer("Name","bn4a_branch2b","Epsilon",0.001)
    reluLayer("Name","activation_24_relu")
    convolution2dLayer([1 1],1024,"Name","res4a_branch2c")
    batchNormalizationLayer("Name","bn4a_branch2c","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    additionLayer(2,"Name","add_8")
    reluLayer("Name","activation_25_relu")];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],256,"Name","res4b_branch2a")
    batchNormalizationLayer("Name","bn4b_branch2a","Epsilon",0.001)
    reluLayer("Name","activation_26_relu")
    convolution2dLayer([3 3],256,"Name","res4b_branch2b","Padding","same")
    batchNormalizationLayer("Name","bn4b_branch2b","Epsilon",0.001)
    reluLayer("Name","activation_27_relu")
    convolution2dLayer([1 1],1024,"Name","res4b_branch2c")
    batchNormalizationLayer("Name","bn4b_branch2c","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    additionLayer(2,"Name","add_9")
    reluLayer("Name","activation_28_relu")];
```

```
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],256,"Name","res4c_branch2a")
    batchNormalizationLayer("Name","bn4c_branch2a","Epsilon",0.001)
    reluLayer("Name","activation_29_relu")
    convolution2dLayer([3 3],256,"Name","res4c_branch2b","Padding","same")
    batchNormalizationLayer("Name","bn4c_branch2b","Epsilon",0.001)
    reluLayer("Name","activation_30_relu")
    convolution2dLayer([1 1],1024,"Name","res4c_branch2c")
    batchNormalizationLayer("Name","bn4c_branch2c","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    additionLayer(2,"Name","add_10")
    reluLayer("Name","activation_31_relu")];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],256,"Name","res4d_branch2a")
    batchNormalizationLayer("Name","bn4d_branch2a","Epsilon",0.001)
    reluLayer("Name","activation_32_relu")
    convolution2dLayer([3 3],256,"Name","res4d_branch2b","Padding","same")
    batchNormalizationLayer("Name","bn4d_branch2b","Epsilon",0.001)
    reluLayer("Name","activation_33_relu")
    convolution2dLayer([1 1],1024,"Name","res4d_branch2c")
    batchNormalizationLayer("Name","bn4d_branch2c","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    additionLayer(2,"Name","add_11")
    reluLayer("Name","activation_34_relu")];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],256,"Name","res4e_branch2a")
    batchNormalizationLayer("Name","bn4e_branch2a","Epsilon",0.001)
    reluLayer("Name","activation_35_relu")
    convolution2dLayer([3 3],256,"Name","res4e_branch2b","Padding","same")
    batchNormalizationLayer("Name","bn4e_branch2b","Epsilon",0.001)
    reluLayer("Name","activation_36_relu")
    convolution2dLayer([1 1],1024,"Name","res4e_branch2c")
    batchNormalizationLayer("Name","bn4e_branch2c","Epsilon",0.001)];
```

```
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    additionLayer(2,"Name","add_12")
    reluLayer("Name","activation_37_relu")];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],256,"Name","res4f_branch2a")
    batchNormalizationLayer("Name","bn4f_branch2a","Epsilon",0.001)
    reluLayer("Name","activation_38_relu")
    convolution2dLayer([3 3],256,"Name","res4f_branch2b","Padding","same")
    batchNormalizationLayer("Name","bn4f_branch2b","Epsilon",0.001)
    reluLayer("Name","activation_39_relu")
    convolution2dLayer([1 1],1024,"Name","res4f_branch2c")
    batchNormalizationLayer("Name","bn4f_branch2c","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    additionLayer(2,"Name","add_13")
    reluLayer("Name","activation_40_relu")];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],512,"Name","res5a_branch2a","Stride",[2 2])
    batchNormalizationLayer("Name","bn5a_branch2a","Epsilon",0.001)
    reluLayer("Name","activation_41_relu")
    convolution2dLayer([3 3],512,"Name","res5a_branch2b","Padding","same")
    batchNormalizationLayer("Name","bn5a_branch2b","Epsilon",0.001)
    reluLayer("Name","activation_42_relu")
    convolution2dLayer([1 1],2048,"Name","res5a_branch2c")
    batchNormalizationLayer("Name","bn5a_branch2c","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],2048,"Name","res5a_branch1","Stride",[2 2])
    batchNormalizationLayer("Name","bn5a_branch1","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    additionLayer(2,"Name","add_14")
    reluLayer("Name","activation_43_relu")];
```

```
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],512,"Name","res5b_branch2a")
    batchNormalizationLayer("Name","bn5b_branch2a","Epsilon",0.001)
    reluLayer("Name","activation_44_relu")
    convolution2dLayer([3 3],512,"Name","res5b_branch2b","Padding","same")
    batchNormalizationLayer("Name","bn5b_branch2b","Epsilon",0.001)
    reluLayer("Name","activation_45_relu")
    convolution2dLayer([1 1],2048,"Name","res5b_branch2c")
    batchNormalizationLayer("Name","bn5b_branch2c","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    additionLayer(2,"Name","add_15")
    reluLayer("Name","activation_46_relu")];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    convolution2dLayer([1 1],512,"Name","res5c_branch2a")
    batchNormalizationLayer("Name","bn5c_branch2a","Epsilon",0.001)
    reluLayer("Name","activation_47_relu")
    convolution2dLayer([3 3],512,"Name","res5c_branch2b","Padding","same")
    batchNormalizationLayer("Name","bn5c_branch2b","Epsilon",0.001)
    reluLayer("Name","activation_48_relu")
    convolution2dLayer([1 1],2048,"Name","res5c_branch2c")
    batchNormalizationLayer("Name","bn5c_branch2c","Epsilon",0.001)];
lgraph = addLayers(lgraph,tempLayers);


tempLayers = [
    additionLayer(2,"Name","add_16")
    reluLayer("Name","activation_49_relu")
    averagePooling2dLayer([7 7],"Name","avg_pool","Stride",[7 7])
    fullyConnectedLayer(4,"Name","fc")
    softmaxLayer("Name","fc1000_softmax")
    classificationLayer("Name","classoutput")];
lgraph = addLayers(lgraph,tempLayers);


lgraph = connectLayers(lgraph,"max_pooling2d_1","res2a_branch2a");
lgraph = connectLayers(lgraph,"max_pooling2d_1","res2a_branch1");
lgraph = connectLayers(lgraph,"bn2a_branch2c","add_1/in1");
lgraph = connectLayers(lgraph,"bn2a_branch1","add_1/in2");
lgraph = connectLayers(lgraph,"activation_4_relu","res2b_branch2a");
```

```
lgraph = connectLayers(lgraph,"activation_4_relu","add_2/in2");
lgraph = connectLayers(lgraph,"bn2b_branch2c","add_2/in1");
lgraph = connectLayers(lgraph,"activation_7_relu","res2c_branch2a");
lgraph = connectLayers(lgraph,"activation_7_relu","add_3/in2");
lgraph = connectLayers(lgraph,"bn2c_branch2c","add_3/in1");
lgraph = connectLayers(lgraph,"activation_10_relu","res3a_branch2a");
lgraph = connectLayers(lgraph,"activation_10_relu","res3a_branch1");
lgraph = connectLayers(lgraph,"bn3a_branch1","add_4/in2");
lgraph = connectLayers(lgraph,"bn3a_branch2c","add_4/in1");
lgraph = connectLayers(lgraph,"activation_13_relu","res3b_branch2a");
lgraph = connectLayers(lgraph,"activation_13_relu","add_5/in2");
lgraph = connectLayers(lgraph,"bn3b_branch2c","add_5/in1");
lgraph = connectLayers(lgraph,"activation_16_relu","res3c_branch2a");
lgraph = connectLayers(lgraph,"activation_16_relu","add_6/in2");
lgraph = connectLayers(lgraph,"bn3c_branch2c","add_6/in1");
lgraph = connectLayers(lgraph,"activation_19_relu","res3d_branch2a");
lgraph = connectLayers(lgraph,"activation_19_relu","add_7/in2");
lgraph = connectLayers(lgraph,"bn3d_branch2c","add_7/in1");
lgraph = connectLayers(lgraph,"activation_22_relu","res4a_branch1");
lgraph = connectLayers(lgraph,"activation_22_relu","res4a_branch2a");
lgraph = connectLayers(lgraph,"bn4a_branch1","add_8/in2");
lgraph = connectLayers(lgraph,"bn4a_branch2c","add_8/in1");
lgraph = connectLayers(lgraph,"activation_25_relu","res4b_branch2a");
lgraph = connectLayers(lgraph,"activation_25_relu","add_9/in2");
lgraph = connectLayers(lgraph,"bn4b_branch2c","add_9/in1");
lgraph = connectLayers(lgraph,"activation_28_relu","res4c_branch2a");
lgraph = connectLayers(lgraph,"activation_28_relu","add_10/in2");
lgraph = connectLayers(lgraph,"bn4c_branch2c","add_10/in1");
lgraph = connectLayers(lgraph,"activation_31_relu","res4d_branch2a");
lgraph = connectLayers(lgraph,"activation_31_relu","add_11/in2");
lgraph = connectLayers(lgraph,"bn4d_branch2c","add_11/in1");
lgraph = connectLayers(lgraph,"activation_34_relu","res4e_branch2a");
lgraph = connectLayers(lgraph,"activation_34_relu","add_12/in2");
lgraph = connectLayers(lgraph,"bn4e_branch2c","add_12/in1");
lgraph = connectLayers(lgraph,"activation_37_relu","res4f_branch2a");
lgraph = connectLayers(lgraph,"activation_37_relu","add_13/in2");
lgraph = connectLayers(lgraph,"bn4f_branch2c","add_13/in1");
lgraph = connectLayers(lgraph,"activation_40_relu","res5a_branch2a");
lgraph = connectLayers(lgraph,"activation_40_relu","res5a_branch1");
lgraph = connectLayers(lgraph,"bn5a_branch2c","add_14/in1");
lgraph = connectLayers(lgraph,"bn5a_branch1","add_14/in2");
lgraph = connectLayers(lgraph,"activation_43_relu","res5b_branch2a");
lgraph = connectLayers(lgraph,"activation_43_relu","add_15/in2");
lgraph = connectLayers(lgraph,"bn5b_branch2c","add_15/in1");
lgraph = connectLayers(lgraph,"activation_46_relu","res5c_branch2a");
lgraph = connectLayers(lgraph,"activation_46_relu","add_16/in2");
lgraph = connectLayers(lgraph,"bn5c_branch2c","add_16/in1");
```

```
clear tempLayers;

plot(lgraph);
```

LAMPIRAN 7 – *Source Code Training* ResNet-50

```
addpath('C:\Users\LENOVO\OneDrive\Desktop\Materi Kuliah\Semester 7\Teknik
Neurofuzi\Tugas\Deep Learning Project\Program Files\VGG19');
unzip('Training.zip');
imds =
imageDatastore('Training','IncludeSubfolders',true,'LabelSource','foldernames')
;
[imdsTrain,imdsValidation] = splitEachLabel(imds,0.7,'randomized');


augimdsTrain = augmentedImageDatastore([224 224],imdsTrain);
augimdsValidation = augmentedImageDatastore([224 224],imdsValidation);


options = trainingOptions('sgdm', ...
    'MiniBatchSize',10, ...
    'MaxEpochs',6, ...
    'Shuffle','every-epoch', ...
    'InitialLearnRate',1e-4, ...
    'ValidationData',augimdsValidation, ...
    'ValidationFrequency',6, ...
    'Verbose',false, ...
    'Plots','training-progress');


netTransfer = trainNetwork(augimdsTrain,lgraph,options);
```

LAMPIRAN 8 – *Source Code Testing* ResNet-50

```
addpath('C:\Users\LENOVO\OneDrive\Desktop\Materi Kuliah\Semester 7\Teknik
Neurofuzi\Tugas\Deep Learning Project\Program Files\VGG19');
unzip('Testing.zip');
imds =
imageDatastore('Testing','IncludeSubfolders',true,'LabelSource','foldernames');
imdsValidation = imds;


augimdsValidation = augmentedImageDatastore([224 224], imdsValidation);


[YPred,probs] = classify(netTransfer,augimdsValidation);
accuracy = mean(YPred == imdsValidation.Labels)


idx = randperm(numel(augimdsValidation.Files),9);
figure
for i = 1:9
    subplot(3,3,i)
    I = readimage(imdsValidation,idx(i));
    imshow(I)
    label = YPred(idx(i));
    title(string(label) + ", " + num2str(100*max(probs(idx(i),:)),3) + "%");
end
```

LAMPIRAN 9 – *Weight & Bias* Hasil Latihan VGG-19

```
>> netTransfer.Layers(2).Weights

  3×3×3×64 single array

ans(:,:,1,1) =

   -0.0005   -0.0871   -0.0466
    0.0179   -0.0582   -0.0122
   -0.0067    0.0710    0.0601


ans(:,:,2,1) =

   -0.0411   -0.0898    0.0580
   -0.0664   -0.0914   -0.0878
   -0.0476    0.0674   -0.0127


ans(:,:,3,1) =

   -0.0297   -0.0205    0.0615
   -0.0671    0.0582   -0.0629
   -0.0246    0.0712   -0.0340


ans(:,:,1,2) =

   -0.0173    0.0089   -0.0471
    0.0911    0.0700    0.0999
   -0.0121    0.0905   -0.0329


ans(:,:,2,2) =

   -0.0493   -0.0849   -0.0084
    0.0738   -0.0908   -0.0636
    0.0359    0.0037    0.0356


ans(:,:,3,2) =

    0.0214   -0.0679    0.0628
    0.0762    0.0619   -0.0000
   -0.0084    0.0928    0.0416


ans(:,:,1,3) =

    0.0664    0.0791   -0.0194
    0.0490    0.0592   -0.0064
   -0.0771   -0.0557    0.0650
```

```
>> netTransfer.Layers(2).Bias

  1×1×64 single array

ans(:,:,1) =

  9.1119e-05


ans(:,:,2) =

 -3.4369e-05


ans(:,:,3) =

  1.3568e-06


ans(:,:,4) =

 -5.0792e-05


ans(:,:,5) =

  6.9235e-05


ans(:,:,6) =

 -4.5045e-05


ans(:,:,7) =

 -3.8534e-05


ans(:,:,8) =

  7.1908e-06


ans(:,:,9) =

 -1.7569e-05


ans(:,:,10) =

  5.6374e-05
```

```
ans(:,:,2,3) =

    0.0821   -0.0212   -0.0755
    0.0551    0.0543   -0.0109
   -0.0373    0.0214    0.0795


ans(:,:,3,3) =

   -0.0537    0.0287    0.0199
    0.0200   -0.0893    0.0914
   -0.0606    0.0268    0.0798


ans(:,:,1,4) =

    0.0260   -0.0120    0.0468
   -0.0030   -0.0955   -0.0022
    0.0937    0.0702    0.0498


ans(:,:,2,4) =

    0.0547    0.0605    0.0059
   -0.0797   -0.0316   -0.0286
   -0.0166    0.0054   -0.0334


ans(:,:,3,4) =

    0.0535    0.0103    0.0763
    0.0941   -0.0308   -0.0526
    0.0237    0.0257    0.0546


ans(:,:,1,5) =

   -0.0111    0.0864    0.0576
   -0.0453    0.0863    0.0368
   -0.0531    0.0771    0.0257


ans(:,:,2,5) =

   -0.0620    0.0154   -0.0773
    0.0789   -0.0362    0.0362
   -0.0994   -0.0701   -0.0982


ans(:,:,3,5) =

    0.0558   -0.0667    0.0876
   -0.0660   -0.0893   -0.0147
   -0.0539   -0.0918   -0.1004


ans(:,:,1,6) =
```

```
ans(:,:,11) =

 -6.2490e-05


ans(:,:,12) =

 -3.4067e-05


ans(:,:,13) =

 -4.2153e-05


ans(:,:,14) =

  1.2327e-05


ans(:,:,15) =

  1.3591e-05


ans(:,:,16) =

 -1.6440e-06


ans(:,:,17) =

 -4.2746e-05


ans(:,:,18) =

  1.4308e-04


ans(:,:,19) =

  6.3387e-05


ans(:,:,20) =

 -3.2276e-05


ans(:,:,21) =

  7.9016e-05


ans(:,:,22) =
```

```
    0.0423   -0.0203    0.0428
   -0.0108   -0.0443    0.0109
   -0.0513   -0.0177   -0.0860


ans(:,:,2,6) =

    0.0690    0.0734    0.0430
   -0.0003    0.0426    0.0108
    0.0916    0.0390    0.0740


ans(:,:,3,6) =

   -0.0021   -0.0962   -0.0266
   -0.0873   -0.0408   -0.0415
   -0.0561   -0.0947    0.0116


ans(:,:,1,7) =

   -0.0093   -0.0415   -0.0250
    0.0070   -0.0640   -0.0100
   -0.0835   -0.0533    0.0386


ans(:,:,2,7) =

   -0.0051   -0.0553    0.0248
   -0.0159    0.0867   -0.0830
   -0.0869    0.0837   -0.0566


ans(:,:,3,7) =

   -0.0751   -0.0543    0.0066
    0.0476    0.0940    0.0785
   -0.0804    0.0364    0.0274


ans(:,:,1,8) =

    0.0786   -0.0575   -0.0121
    0.0792   -0.0754   -0.0043
    0.0851   -0.0705   -0.0350


ans(:,:,2,8) =

   -0.0540    0.0520   -0.0757
   -0.0297   -0.0455    0.0271
   -0.0693    0.0306    0.0648


ans(:,:,3,8) =

 -6.3733e-05


ans(:,:,23) =

 -5.9651e-05


ans(:,:,24) =

 -2.5285e-05


ans(:,:,25) =

 -9.0131e-05


ans(:,:,26) =

 -6.9201e-05


ans(:,:,27) =

  6.1074e-06


ans(:,:,28) =

  9.5067e-05


ans(:,:,29) =

 -3.9071e-05


ans(:,:,30) =

 -7.2953e-05


ans(:,:,31) =

 -4.3349e-05


ans(:,:,32) =

 -3.2519e-05


ans(:,:,33) =

  1.6067e-05
```

```
    0.0980    0.0214   -0.0121
    0.0472    0.0505   -0.0303
   -0.0246    0.0525    0.0457


ans(:,:,1,9) =

   -0.0334   -0.0028    0.0815
    0.0534    0.0134   -0.0247
   -0.0271    0.0244    0.0706


ans(:,:,2,9) =

   -0.0541   -0.0831   -0.0800
    0.0646    0.0574   -0.0116
   -0.0560    0.0195   -0.0941


ans(:,:,3,9) =

   -0.0054   -0.0903   -0.0295
   -0.0524    0.0023    0.0919
    0.0763    0.0496   -0.0851


ans(:,:,1,10) =

   -0.0228   -0.0899   -0.0496
   -0.0442   -0.0489    0.0174
   -0.0603    0.0042   -0.0898


ans(:,:,2,10) =

    0.0099   -0.0353   -0.0925
    0.0864   -0.0485   -0.0751
   -0.0510    0.0473   -0.0451


ans(:,:,3,10) =

   -0.0173   -0.0328   -0.0206
   -0.0675    0.0091    0.0450
   -0.0107   -0.0100    0.0425


ans(:,:,1,11) =

   -0.0432   -0.0726   -0.0466
   -0.0100   -0.0311    0.0802
   -0.0888   -0.0733    0.0668


ans(:,:,2,11) =

    0.0786   -0.0517   -0.0219


ans(:,:,34) =

 -3.2450e-05


ans(:,:,35) =

 -1.3925e-05


ans(:,:,36) =

 -1.8199e-05


ans(:,:,37) =

  3.8500e-05


ans(:,:,38) =

  1.1234e-04


ans(:,:,39) =

 -4.3854e-05


ans(:,:,40) =

  8.1205e-05


ans(:,:,41) =

 -1.5705e-05


ans(:,:,42) =

 -1.8429e-05


ans(:,:,43) =

 -3.3959e-05


ans(:,:,44) =

  1.2594e-04
```

```
   -0.0414    0.0927   -0.0009
    0.0629   -0.0529    0.0238


ans(:,:,3,11) =

    0.0475   -0.0172    0.0638
   -0.0223   -0.0937   -0.0489
    0.0108    0.0622    0.0093


ans(:,:,1,12) =

    0.0986   -0.0920   -0.0754
   -0.0146    0.0147    0.0459
   -0.0588    0.0708    0.0379


ans(:,:,2,12) =

   -0.0037    0.0783    0.0786
    0.0753    0.0996    0.0261
    0.0160    0.0626    0.0241


ans(:,:,3,12) =

   -0.0616   -0.0374   -0.0518
   -0.0480    0.0845   -0.0719
   -0.0109   -0.0095   -0.0087


ans(:,:,1,13) =

    0.0728    0.0262   -0.0873
    0.1010   -0.0282   -0.0298
   -0.0417    0.0605    0.0448


ans(:,:,2,13) =

   -0.0009   -0.0241   -0.0714
    0.0273    0.0032   -0.0260
    0.0807    0.0375    0.0487


ans(:,:,3,13) =

   -0.0103    0.0241    0.0307
   -0.0227   -0.0368    0.0375
   -0.0923    0.0149    0.0204


ans(:,:,1,14) =

    0.0263   -0.0927    0.0971
    0.0431    0.0201    0.0405
```

```
ans(:,:,45) =

 -3.7039e-05


ans(:,:,46) =

 -3.8941e-05


ans(:,:,47) =

  1.0084e-04


ans(:,:,48) =

 -2.1202e-05


ans(:,:,49) =

 -2.6101e-05


ans(:,:,50) =

  2.5839e-05


ans(:,:,51) =

 -2.4330e-06


ans(:,:,52) =

 -3.1458e-05


ans(:,:,53) =

  5.5861e-05


ans(:,:,54) =

 -3.3608e-05


ans(:,:,55) =

 -2.7474e-06


ans(:,:,56) =
```

```
   -0.0521    0.0764   -0.0081


ans(:,:,2,14) =

   -0.0299   -0.0983    0.0890
   -0.0629    0.0482    0.0871
   -0.0605    0.0802   -0.0284


ans(:,:,3,14) =

    0.0810   -0.0572   -0.0970
    0.0453   -0.0554    0.0052
    0.0288   -0.0172   -0.0266


ans(:,:,1,15) =

    0.0525    0.0009    0.0755
    0.0632   -0.0365   -0.0610
    0.0624    0.0163   -0.0498


ans(:,:,2,15) =

    0.0477   -0.0017    0.0483
    0.0435   -0.0001    0.0755
   -0.0494    0.0295   -0.0178


ans(:,:,3,15) =

    0.0846    0.0443   -0.0804
    0.0050   -0.0555   -0.0087
    0.0238    0.0254   -0.0303


ans(:,:,1,16) =

    0.0492    0.0033   -0.0040
    0.0484    0.0752    0.0879
    0.0287    0.0659   -0.0931


ans(:,:,2,16) =

   -0.0717   -0.0772    0.0245
   -0.0998   -0.0516    0.0600
    0.0572   -0.0053   -0.0919


ans(:,:,3,16) =

    0.0068    0.0903   -0.0433
   -0.0252    0.0642    0.0746
    0.0065   -0.0111   -0.0487
```

```
  1.8676e-05


ans(:,:,57) =

  1.3997e-05


ans(:,:,58) =

  2.2623e-04


ans(:,:,59) =

 -2.1785e-05


ans(:,:,60) =

  1.2869e-04


ans(:,:,61) =

 -2.7603e-05


ans(:,:,62) =

 -2.9783e-06


ans(:,:,63) =

  5.1221e-06


ans(:,:,64) =

  9.6376e-06
```

```
ans(:,:,1,17) =

    0.0915   -0.0516    0.0989
    0.0238   -0.0917    0.0647
    0.0987    0.0178   -0.0284


ans(:,:,2,17) =

    0.0894   -0.0337   -0.0382
    0.1002   -0.0614   -0.0137
    0.0812   -0.0575    0.0523


ans(:,:,3,17) =

    0.0473    0.1011   -0.0317
    0.0842    0.0540    0.0956
   -0.0450    0.0797    0.0164


ans(:,:,1,18) =

    0.0112    0.0880   -0.0721
   -0.0653    0.0262    0.0526
    0.0713    0.0664   -0.0472


ans(:,:,2,18) =

    0.0512   -0.0889    0.0673
    0.0781    0.0069    0.0285
   -0.0410   -0.0932   -0.0865


ans(:,:,3,18) =

   -0.0363   -0.0612   -0.0674
    0.0073    0.0497   -0.0677
   -0.0242    0.0070   -0.0259


ans(:,:,1,19) =

   -0.0443    0.0071   -0.0215
    0.0326    0.0344   -0.0726
    0.0910   -0.0841    0.0455


ans(:,:,2,19) =

   -0.0432   -0.0985   -0.0673
    0.0378   -0.0577    0.0393
    0.0909   -0.0752   -0.0154
```

```
ans(:,:,3,19) =

    0.0631    0.0266   -0.0616
    0.0249   -0.0062   -0.0635
   -0.0382   -0.0959    0.0154


ans(:,:,1,20) =

    0.0514    0.0623    0.0933
    0.1012   -0.0127   -0.0390
    0.0296    0.0335   -0.0421


ans(:,:,2,20) =

    0.0380   -0.0401    0.0743
   -0.0932   -0.0183   -0.0658
    0.0656    0.0691    0.0097


ans(:,:,3,20) =

   -0.0443    0.0151   -0.0185
   -0.0539    0.0160   -0.0938
    0.0678   -0.0377   -0.0187


ans(:,:,1,21) =

   -0.0995    0.0505    0.0260
   -0.0382   -0.0935   -0.0828
    0.0440   -0.0229   -0.0869


ans(:,:,2,21) =

   -0.0231    0.0484   -0.0893
    0.0417    0.0561   -0.0161
   -0.0468   -0.0065   -0.0628


ans(:,:,3,21) =

    0.0397   -0.0474   -0.0297
    0.0249    0.0003   -0.0219
    0.0364    0.0549    0.0893


ans(:,:,1,22) =

    0.0947    0.0060    0.0068
   -0.0162   -0.0524    0.0255
    0.0980    0.0663    0.0201
```

```
ans(:,:,2,22) =

   -0.0422    0.0098    0.0790
    0.0657    0.0604   -0.0048
   -0.0109   -0.0280   -0.0596


ans(:,:,3,22) =

    0.0179    0.0266   -0.0620
    0.0673   -0.0728    0.0893
   -0.0701    0.0189    0.0874


ans(:,:,1,23) =

    0.0784   -0.0961    0.0105
   -0.0931   -0.0803    0.0837
    0.0147    0.0982    0.0441


ans(:,:,2,23) =

   -0.0017   -0.0164   -0.0508
    0.0050   -0.0496   -0.0244
   -0.0083   -0.0515    0.0921


ans(:,:,3,23) =

   -0.0625    0.0750   -0.0913
    0.0873   -0.0252    0.0979
   -0.0961    0.0663    0.0100


ans(:,:,1,24) =

    0.0892   -0.0342    0.0963
    0.0718   -0.0542    0.0710
   -0.0777   -0.0220   -0.0713


ans(:,:,2,24) =

   -0.0732   -0.0182    0.0984
   -0.0357    0.0348   -0.0908
   -0.0252    0.0829    0.0930


ans(:,:,3,24) =

    0.0892   -0.0978   -0.0209
   -0.0671   -0.0385   -0.0685
    0.0404    0.0152    0.0126


ans(:,:,1,25) =
```

```
   -0.0726    0.0726    0.0080
    0.0226   -0.0226    0.0500
   -0.0958    0.1009    0.0561


ans(:,:,2,25) =

    0.0915    0.0598    0.0541
    0.0553   -0.0541    0.0478
    0.0760    0.0603   -0.0031


ans(:,:,3,25) =

    0.1012    0.0815    0.0429
   -0.0935    0.0526    0.0673
    0.0380   -0.0300    0.0325


ans(:,:,1,26) =

   -0.0730   -0.0134   -0.0887
   -0.0745   -0.0167    0.0309
   -0.0876    0.0186   -0.0327


ans(:,:,2,26) =

    0.0793   -0.0906    0.0612
   -0.0190    0.0403    0.0577
   -0.0216    0.0047   -0.0876


ans(:,:,3,26) =

    0.0332   -0.0194   -0.0729
    0.0825    0.0506   -0.0731
   -0.0157   -0.0172    0.0939


ans(:,:,1,27) =

    0.0852    0.0150    0.0609
    0.0814    0.0919   -0.0478
   -0.0810   -0.0489   -0.0821


ans(:,:,2,27) =

   -0.0043    0.0281   -0.0549
    0.0258    0.0161    0.0292
    0.0493   -0.0339    0.0162


ans(:,:,3,27) =
```

```
   -0.0973    0.0664    0.0926
   -0.0846    0.0888   -0.0973
    0.0505    0.0543    0.0429


ans(:,:,1,28) =

    0.0113   -0.0271    0.0812
   -0.0062    0.0773    0.0393
   -0.0522   -0.0866    0.0337


ans(:,:,2,28) =

   -0.0684   -0.0088    0.0544
   -0.0963   -0.0383   -0.0141
   -0.0890   -0.0579    0.0042


ans(:,:,3,28) =

   -0.0435    0.0967   -0.0890
    0.0284   -0.0381    0.0627
   -0.0021    0.0645   -0.0713


ans(:,:,1,29) =

   -0.0236    0.0034    0.0928
    0.0483   -0.0165    0.0146
   -0.0122   -0.0476    0.0332


ans(:,:,2,29) =

    0.0795   -0.0010   -0.0495
   -0.0128    0.0355    0.0866
    0.0645   -0.0009   -0.0922


ans(:,:,3,29) =

    0.0477   -0.0621    0.1011
    0.0869    0.0173    0.0167
    0.0495   -0.0054    0.0647


ans(:,:,1,30) =

   -0.0584   -0.0905   -0.0844
   -0.0856   -0.0478    0.0485
    0.0892    0.0000   -0.0697


ans(:,:,2,30) =

    0.0016    0.0667   -0.0438
```

```
   -0.0891   -0.0635   -0.0221
   -0.0510   -0.0862   -0.0933


ans(:,:,3,30) =

   -0.0051   -0.0147    0.0496
    0.0511    0.0089    0.0094
    0.0864    0.0967   -0.0239


ans(:,:,1,31) =

    0.0850   -0.0096    0.0053
   -0.0670    0.0889    0.0801
   -0.0608   -0.0230   -0.0046


ans(:,:,2,31) =

   -0.0070    0.0771   -0.0896
    0.0309    0.0024   -0.0039
   -0.0608    0.0100   -0.0757


ans(:,:,3,31) =

    0.0366    0.0636    0.0582
    0.0935    0.0701    0.0437
    0.0772    0.0664    0.0286


ans(:,:,1,32) =

    0.0045    0.0403    0.0702
   -0.0651    0.0424   -0.0657
    0.0931    0.0640    0.0034


ans(:,:,2,32) =

    0.0915   -0.0551    0.0556
   -0.0447    0.0981    0.0343
    0.0825   -0.0278    0.0529


ans(:,:,3,32) =

    0.0126    0.0858    0.0233
    0.0384   -0.0630   -0.0219
    0.0208   -0.0158   -0.0205


ans(:,:,1,33) =

    0.0785   -0.0901    0.0177
   -0.0618    0.0044    0.0828
```

```
   -0.0104    0.0521    0.0156


ans(:,:,2,33) =

    0.0274    0.0931   -0.0416
    0.0939    0.0515   -0.0793
   -0.0125   -0.0608   -0.0671


ans(:,:,3,33) =

    0.0543    0.0927    0.0001
    0.0529    0.0925    0.0775
   -0.0171   -0.0612   -0.0138


ans(:,:,1,34) =

   -0.0084    0.0076   -0.0102
   -0.0737    0.0689    0.0197
   -0.0589   -0.0761    0.0469


ans(:,:,2,34) =

    0.0695   -0.0390    0.0629
   -0.0854    0.0604    0.0563
   -0.0814    0.1020    0.0719


ans(:,:,3,34) =

    0.0127   -0.0864    0.0038
    0.0422   -0.0865    0.0908
    0.0893    0.0905    0.0845


ans(:,:,1,35) =

   -0.0571    0.0108    0.0502
    0.0235    0.0970   -0.0474
    0.0490    0.0856    0.0894


ans(:,:,2,35) =

   -0.0863    0.0586    0.0633
   -0.0396   -0.0543    0.0317
   -0.0588    0.0030   -0.0721


ans(:,:,3,35) =

    0.0364    0.0612   -0.0951
    0.0328   -0.0680    0.0094
   -0.0528   -0.0650    0.0082
```

```
ans(:,:,1,36) =

   -0.0303    0.0659    0.0189
    0.0623    0.0507   -0.0198
    0.0461   -0.0626    0.0358


ans(:,:,2,36) =

   -0.0160    0.0351    0.0725
    0.0314   -0.0945    0.0501
    0.0663    0.0366    0.0811


ans(:,:,3,36) =

   -0.0550   -0.0287    0.0408
    0.0189    0.1001    0.0181
   -0.0259    0.0469   -0.0969


ans(:,:,1,37) =

   -0.0912    0.0261   -0.0081
   -0.0045   -0.0027    0.0259
   -0.0290   -0.0449    0.0153


ans(:,:,2,37) =

    0.0231   -0.0649   -0.0620
    0.0734   -0.0443   -0.0950
   -0.0041    0.0832    0.0553


ans(:,:,3,37) =

   -0.0706   -0.0643    0.0100
   -0.0331    0.0727   -0.0880
   -0.0482   -0.0285   -0.0337


ans(:,:,1,38) =

   -0.0524   -0.0192    0.0435
   -0.0463   -0.0360   -0.0952
    0.0383    0.0061   -0.0011


ans(:,:,2,38) =

    0.0414    0.0273   -0.0817
   -0.0035   -0.0176   -0.0326
    0.0799   -0.0833   -0.0922
```

```
ans(:,:,3,38) =

   -0.0918    0.0100   -0.0513
   -0.0963   -0.0161    0.0860
   -0.0170   -0.0011   -0.0775


ans(:,:,1,39) =

    0.0808   -0.0038    0.0124
    0.0946   -0.0791    0.0759
    0.0633   -0.0131    0.0444


ans(:,:,2,39) =

    0.0244   -0.0418   -0.0843
    0.0370    0.0744    0.0864
    0.0361   -0.0650   -0.0980


ans(:,:,3,39) =

    0.0226    0.0481   -0.0870
   -0.0611   -0.0589    0.0360
    0.0111    0.0639   -0.0406


ans(:,:,1,40) =

   -0.0061    0.0132   -0.0060
    0.0740   -0.0226    0.0395
    0.0364    0.0388   -0.0868


ans(:,:,2,40) =

   -0.0978   -0.0641   -0.0521
   -0.0700    0.0505   -0.0489
   -0.0971    0.0438   -0.0071


ans(:,:,3,40) =

   -0.0198    0.0974    0.0107
    0.0932   -0.0772   -0.0201
   -0.0776    0.0266   -0.0359


ans(:,:,1,41) =

    0.0358   -0.0765    0.0892
   -0.0644   -0.0570   -0.0627
   -0.0753    0.0862    0.0957
```

```
ans(:,:,2,41) =

    0.0860    0.0011    0.0118
    0.0569    0.0234   -0.0288
   -0.0327    0.0212   -0.0912


ans(:,:,3,41) =

    0.0824    0.0545   -0.0378
    0.0203   -0.0236    0.0634
   -0.0090    0.0385    0.0198


ans(:,:,1,42) =

    0.0638    0.0634   -0.0211
   -0.0695    0.0074    0.0553
    0.0306    0.0376    0.0857


ans(:,:,2,42) =

   -0.0492   -0.0771    0.0226
   -0.0672    0.0338   -0.0350
    0.0929    0.0488    0.0918


ans(:,:,3,42) =

    0.0859   -0.0071   -0.0118
    0.0057    0.0014    0.1034
    0.0055   -0.0052   -0.0336


ans(:,:,1,43) =

    0.0197    0.0731   -0.0160
   -0.0841    0.0281    0.0927
   -0.0082    0.0733    0.0045


ans(:,:,2,43) =

    0.0897    0.0772    0.0495
    0.0593    0.0314   -0.0855
    0.0150    0.0702    0.0561


ans(:,:,3,43) =

   -0.0586    0.0922   -0.0546
    0.0493    0.0056    0.0758
   -0.0519    0.0911   -0.0526


ans(:,:,1,44) =
```

```
   -0.1007   -0.0067   -0.0597
    0.0169    0.0401   -0.0823
   -0.0456    0.0164   -0.0309


ans(:,:,2,44) =

   -0.0330   -0.0321   -0.0014
   -0.0955    0.0433    0.0299
   -0.0998    0.0320    0.0577


ans(:,:,3,44) =

    0.0279    0.0920   -0.0967
    0.0409    0.0727   -0.0356
    0.0603   -0.0403   -0.0426


ans(:,:,1,45) =

    0.0893    0.0500    0.0231
    0.0088   -0.0541    0.0900
    0.0534    0.0718    0.0917


ans(:,:,2,45) =

   -0.0576   -0.0799   -0.0839
    0.0633   -0.0041   -0.0138
    0.0840   -0.0255   -0.0113


ans(:,:,3,45) =

    0.0256    0.0024   -0.0818
    0.0067    0.0606    0.0880
   -0.0351   -0.0149   -0.0909


ans(:,:,1,46) =

    0.0614    0.0862    0.0217
    0.0005   -0.0593   -0.0723
    0.0400    0.0356   -0.0339


ans(:,:,2,46) =

   -0.0008   -0.0186   -0.0578
   -0.0150    0.0270   -0.0595
    0.0885   -0.0039   -0.0710


ans(:,:,3,46) =
```

```
    0.0242   -0.0194    0.0070
   -0.0805    0.0586   -0.0429
    0.0758    0.0276   -0.0250


ans(:,:,1,47) =

    0.0796    0.0484    0.0654
   -0.0700   -0.0532    0.0045
   -0.0883   -0.0376    0.0514


ans(:,:,2,47) =

   -0.0651   -0.0532    0.0385
    0.0544   -0.0759    0.0248
    0.0441   -0.0625    0.0728


ans(:,:,3,47) =

   -0.0487   -0.0446   -0.0435
    0.0399   -0.0950    0.0218
   -0.0311   -0.0692   -0.0530


ans(:,:,1,48) =

    0.0132   -0.0759   -0.0035
    0.0011    0.0720    0.0326
   -0.0279   -0.0492   -0.0290


ans(:,:,2,48) =

   -0.0873    0.0236   -0.0593
    0.0640    0.0451    0.0781
    0.0368   -0.0176    0.0278


ans(:,:,3,48) =

    0.0402   -0.0702   -0.0758
   -0.0236    0.0140    0.0511
   -0.0425   -0.0126    0.0142


ans(:,:,1,49) =

    0.0760   -0.0256    0.0273
    0.0991    0.0128    0.0982
   -0.0427    0.0192   -0.0819


ans(:,:,2,49) =

    0.0691   -0.0322   -0.0007
```

```
    0.0867   -0.0469    0.0848
   -0.0335    0.0209   -0.0060


ans(:,:,3,49) =

    0.0744    0.0360    0.0690
    0.0338   -0.0401   -0.0090
   -0.0967    0.0443    0.0883


ans(:,:,1,50) =

   -0.0560    0.0466    0.0525
    0.0967    0.0734    0.0323
   -0.0575    0.0966   -0.0625


ans(:,:,2,50) =

    0.0945   -0.0672    0.0000
    0.0835   -0.0466   -0.0334
   -0.0873    0.0858    0.0461


ans(:,:,3,50) =

   -0.0255   -0.0441    0.0379
   -0.0348   -0.0940   -0.0482
   -0.0058   -0.0426   -0.0394


ans(:,:,1,51) =

   -0.0332    0.0507    0.0593
    0.0806   -0.0909   -0.0431
   -0.0287    0.0355    0.0395


ans(:,:,2,51) =

    0.0344    0.0836    0.0825
   -0.0935   -0.0125    0.0987
    0.0074   -0.0867   -0.0905


ans(:,:,3,51) =

   -0.0548    0.0585   -0.0718
    0.0455   -0.0385    0.0666
    0.0305    0.0468    0.0834


ans(:,:,1,52) =

   -0.0508    0.0098   -0.0326
   -0.0464    0.0224    0.0856
```

```
   -0.0524    0.0125    0.0331


ans(:,:,2,52) =

    0.0739   -0.0329    0.0245
    0.0377    0.0597    0.0216
    0.0512    0.0286   -0.0485


ans(:,:,3,52) =

   -0.0095   -0.0119    0.0952
    0.0137   -0.0242   -0.0404
   -0.0143    0.0331   -0.0790


ans(:,:,1,53) =

    0.0503   -0.0648   -0.0339
    0.0491    0.0887    0.0967
    0.0280    0.0087   -0.0620


ans(:,:,2,53) =

   -0.0708   -0.0854    0.0695
   -0.0632    0.0382    0.0721
   -0.0951    0.0776    0.0418


ans(:,:,3,53) =

   -0.0696   -0.0081    0.0615
   -0.0174    0.0465   -0.0249
   -0.0534   -0.0048   -0.0922


ans(:,:,1,54) =

    0.0884    0.0295    0.0882
   -0.0305   -0.0730   -0.0097
    0.0851    0.0995    0.0719


ans(:,:,2,54) =

    0.0938   -0.0353   -0.0340
   -0.0503    0.0972    0.0654
    0.0315   -0.0604   -0.0651


ans(:,:,3,54) =

   -0.0620    0.0331    0.0497
   -0.0093    0.0722    0.0320
    0.0168    0.0806   -0.0226
```

```
ans(:,:,1,55) =

   -0.0367    0.0226   -0.0423
    0.0545   -0.0107    0.0929
    0.0007   -0.0127   -0.0482


ans(:,:,2,55) =

   -0.0363   -0.0749    0.0132
    0.0906    0.0203    0.0851
    0.0843    0.0927    0.0763


ans(:,:,3,55) =

   -0.0905    0.0601    0.0433
    0.0451    0.0391    0.0311
   -0.0823   -0.0727   -0.0374


ans(:,:,1,56) =

   -0.0546    0.0750    0.0210
    0.0835    0.0087    0.0892
   -0.0949   -0.0778   -0.0238


ans(:,:,2,56) =

    0.0752    0.0534   -0.0116
    0.0110   -0.0917    0.0065
    0.0251   -0.0377   -0.0786


ans(:,:,3,56) =

    0.0687    0.0089    0.0227
   -0.0742   -0.0030   -0.0794
    0.0060   -0.0966   -0.0113


ans(:,:,1,57) =

   -0.0943    0.0398    0.0410
    0.0540   -0.0219   -0.0415
    0.0058    0.0144    0.0146


ans(:,:,2,57) =

   -0.0319    0.0322    0.0793
   -0.0419    0.0383   -0.0981
    0.0813    0.0730    0.0901
```

```
ans(:,:,3,57) =

   -0.0295   -0.0227   -0.0032
   -0.0461   -0.0992    0.0210
   -0.0672    0.0961    0.0755


ans(:,:,1,58) =

    0.0898    0.0243   -0.0387
   -0.0352    0.0817   -0.0948
   -0.0332   -0.0388    0.0181


ans(:,:,2,58) =

   -0.0644   -0.0436   -0.0777
   -0.0715    0.0688   -0.0181
   -0.1010   -0.0598    0.0476


ans(:,:,3,58) =

   -0.0352   -0.0773   -0.0566
   -0.0298    0.0888   -0.0733
    0.0407   -0.0062   -0.0771


ans(:,:,1,59) =

    0.0431    0.0113    0.0263
    0.0451    0.0957   -0.0946
    0.0246    0.0591    0.0566


ans(:,:,2,59) =

   -0.0820   -0.0187    0.0522
   -0.0518   -0.0782    0.0391
   -0.0061   -0.0010    0.0044


ans(:,:,3,59) =

   -0.0362    0.0699   -0.0472
   -0.0778   -0.0569    0.0847
    0.0249    0.0186   -0.0635


ans(:,:,1,60) =

   -0.0070    0.0051   -0.0418
   -0.1006   -0.0975    0.0858
    0.0171    0.0350    0.0546
```

```
ans(:,:,2,60) =

    0.0058   -0.0558   -0.0451
   -0.0555   -0.0694    0.0716
    0.0939   -0.0509   -0.0458


ans(:,:,3,60) =

   -0.0848   -0.0910    0.0285
    0.0760   -0.0640    0.0544
   -0.0971   -0.0106   -0.0563


ans(:,:,1,61) =

   -0.0941   -0.0012    0.0988
    0.0907    0.0516    0.0358
   -0.0022    0.0652   -0.0257


ans(:,:,2,61) =

    0.0768   -0.0160    0.0674
   -0.0103    0.0072   -0.0029
   -0.0297    0.0509    0.0776


ans(:,:,3,61) =

   -0.0455    0.0129    0.0927
    0.0648   -0.0762    0.0775
    0.0829   -0.0090    0.0528


ans(:,:,1,62) =

    0.0764   -0.0568    0.0072
    0.0785    0.0736    0.0774
   -0.0467   -0.0950    0.0034


ans(:,:,2,62) =

    0.0482   -0.0854    0.0866
   -0.0040    0.0549   -0.0604
   -0.0888    0.0594    0.0779


ans(:,:,3,62) =

    0.0719    0.0659    0.0349
   -0.0542   -0.0538    0.0882
   -0.0487   -0.0205   -0.0730


ans(:,:,1,63) =
```

```
   -0.0692   -0.0417   -0.0891
   -0.0954   -0.0234    0.0572
    0.0660    0.0236   -0.0803


ans(:,:,2,63) =

   -0.0217   -0.0970   -0.0314
   -0.0727    0.0855   -0.0573
    0.0349   -0.0713    0.0465


ans(:,:,3,63) =

    0.0130   -0.0474    0.0083
   -0.0511   -0.0320   -0.0550
    0.0226    0.0591    0.0731


ans(:,:,1,64) =

   -0.0815    0.0122   -0.0910
    0.0437    0.0048   -0.0144
   -0.0964    0.0864    0.0759


ans(:,:,2,64) =

    0.0820    0.0202    0.0686
   -0.0445    0.0812    0.0554
    0.0290   -0.0082   -0.0133


ans(:,:,3,64) =

   -0.0128   -0.0563   -0.0072
    0.0840    0.0971    0.0044
   -0.0401    0.0776   -0.0441
```

LAMPIRAN 10 – *Weight & Bias* Hasil Latihan ResNet-50

```
>>  netTransfer.Layers(2).Weights

  7×7×3×64 single array

ans(:,:,1,1) =

   -0.0273   -0.0316    0.0021   -0.0237
0.0015   -0.0283    0.0506
    0.0473   -0.0251    0.0351    0.0162
-0.0424    0.0278   -0.0021
   -0.0124    0.0320   -0.0055   -0.0218
-0.0052   -0.0194    0.0206
   -0.0072    0.0210    0.0079    0.0433
0.0316    0.0532    0.0157
    0.0556    0.0343    0.0272   -0.0208
0.0012   -0.0282   -0.0047
    0.0067   -0.0099    0.0458    0.0093
-0.0215   -0.0307   -0.0091
   -0.0003   -0.0047   -0.0341   -0.0168
0.0375   -0.0001   -0.0235


ans(:,:,2,1) =

    0.0131    0.0368    0.0255    0.0305
-0.0148   -0.0247    0.0010
   -0.0194    0.0315    0.0478    0.0037
0.0012   -0.0189    0.0330
    0.0451    0.0574    0.0170   -0.0253
-0.0093   -0.0219    0.0450
   -0.0246    0.0379    0.0385   -0.0263
0.0249    0.0273    0.0392
    0.0463    0.0524   -0.0024    0.0260
0.0438   -0.0169    0.0149
    0.0312    0.0247    0.0438   -0.0235
-0.0169    0.0488    0.0096
   -0.0071    0.0278   -0.0314    0.0386
0.0526    0.0458    0.0195


ans(:,:,3,1) =

    0.0347    0.0489    0.0487   -0.0214
0.0082    0.0072   -0.0252
   -0.0099   -0.0076    0.0491   -0.0334
0.0188    0.0134    0.0153
    0.0619    0.0036    0.0073   -0.0064
0.0107   -0.0240    0.0152
    0.0511   -0.0074    0.0293    0.0179
0.0050    0.0118    0.0307
    0.0045   -0.0090    0.0342   -0.0084
-0.0192    0.0290   -0.0184
```

```
>> netTransfer.Layers(2).Bias

  1×1×64 single array

ans(:,:,1) =

  2.6659e-10


ans(:,:,2) =

  4.9017e-10


ans(:,:,3) =

 -8.1748e-10


ans(:,:,4) =

  5.0024e-10


ans(:,:,5) =

  9.2982e-10


ans(:,:,6) =

 -1.1518e-10


ans(:,:,7) =

  5.3356e-11


ans(:,:,8) =

  8.8464e-10


ans(:,:,9) =

 -1.7279e-10


ans(:,:,10) =

  1.9054e-10
```

```
    0.0333    0.0038    0.0161    0.0155
0.0282   -0.0269    0.0375
    0.0512    0.0278    0.0345   -0.0035
-0.0182   -0.0184    0.0422


ans(:,:,1,2) =

    0.0247   -0.0387    0.0234    0.0297
-0.0139    0.0305    0.0025
   -0.0254    0.0451    0.0315   -0.0087
0.0303    0.0407    0.0508
   -0.0193    0.0123   -0.0180    0.0150
-0.0105    0.0265    0.0291
    0.0487    0.0538    0.0473   -0.0151
0.0211    0.0119   -0.0206
    0.0505    0.0546   -0.0214    0.0438
0.0321    0.0065    0.0007
   -0.0046   -0.0125    0.0213    0.0418
0.0346    0.0382   -0.0062
   -0.0446   -0.0319   -0.0420   -0.0188
0.0457    0.0342    0.0087


ans(:,:,2,2) =

    0.0154    0.0244   -0.0063   -0.0285
0.0383    0.0297   -0.0223
    0.0221   -0.0026    0.0168   -0.0130
0.0360    0.0486   -0.0126
    0.0499    0.0292    0.0152    0.0496
-0.0070    0.0375   -0.0238
    0.0021    0.0116    0.0189    0.0126
0.0431   -0.0200    0.0434
    0.0135    0.0440    0.0091    0.0210
0.0522   -0.0047    0.0506
    0.0375    0.0124    0.0423   -0.0048
0.0326    0.0056    0.0613
    0.0208   -0.0214    0.0389    0.0226
0.0135   -0.0080   -0.0094


ans(:,:,3,2) =

   -0.0435   -0.0191   -0.0252   -0.0339
0.0188    0.0086    0.0219
   -0.0305    0.0136    0.0200    0.0314
-0.0012    0.0168   -0.0204
   -0.0042   -0.0041   -0.0232   -0.0083
-0.0058    0.0100   -0.0126
    0.0569    0.0205    0.0426    0.0133
0.0471   -0.0195    0.0038
    0.0026    0.0481   -0.0125   -0.0186
-0.0034   -0.0072    0.0483
    0.0177   -0.0138    0.0366   -0.0329
0.0201   -0.0076    0.0416
```

```
ans(:,:,11) =

 -5.0674e-10


ans(:,:,12) =

 -2.9782e-10


ans(:,:,13) =

 -1.1976e-09


ans(:,:,14) =

 -4.9338e-10


ans(:,:,15) =

 -1.2775e-11


ans(:,:,16) =

  6.4724e-11


ans(:,:,17) =

  4.6389e-10


ans(:,:,18) =

  6.1284e-11


ans(:,:,19) =

  4.2648e-10


ans(:,:,20) =

  4.3641e-10


ans(:,:,21) =

 -9.3051e-10


ans(:,:,22) =
```

```
   -0.0386   -0.0032   -0.0082    0.0073
-0.0316   -0.0289   -0.0051


ans(:,:,1,3) =

    0.0075   -0.0024   -0.0066   -0.0306
0.0066   -0.0045    0.0539
   -0.0278    0.0334    0.0410   -0.0222
0.0114   -0.0011    0.0504
   -0.0179    0.0310   -0.0315    0.0267
0.0159    0.0071    0.0199
   -0.0279   -0.0105    0.0434    0.0288
0.0310    0.0337    0.0313
    0.0063    0.0359    0.0154    0.0460
0.0187   -0.0261    0.0335
    0.0233    0.0369    0.0349    0.0490
0.0277    0.0529   -0.0231
   -0.0007    0.0027    0.0143   -0.0356
0.0279   -0.0280    0.0372


ans(:,:,2,3) =

    0.0179   -0.0144    0.0101   -0.0183
0.0156    0.0169    0.0177
    0.0105    0.0276    0.0326   -0.0018
0.0054   -0.0228   -0.0038
    0.0134   -0.0105   -0.0351    0.0376
0.0359   -0.0100    0.0136
    0.0383    0.0286    0.0020    0.0168
0.0111   -0.0181   -0.0199
   -0.0158   -0.0045    0.0277    0.0019
0.0153    0.0142    0.0333
   -0.0104    0.0018    0.0399    0.0441
0.0214    0.0309   -0.0148
    0.0054    0.0064    0.0264    0.0045
-0.0342    0.0404    0.0362


ans(:,:,3,3) =

    0.0014   -0.0194   -0.0252    0.0433
0.0011   -0.0125    0.0087
   -0.0013   -0.0152    0.0175   -0.0375
0.0001    0.0360    0.0347
    0.0422    0.0414    0.0348    0.0237
0.0226   -0.0188    0.0423
    0.0414    0.0022    0.0445    0.0368
0.0418    0.0492   -0.0078
    0.0001   -0.0189    0.0436   -0.0338
0.0318   -0.0168    0.0560
    0.0142    0.0162    0.0267   -0.0070
0.0098   -0.0209    0.0397
    0.0007    0.0352    0.0085   -0.0198
-0.0368   -0.0323    0.0016
```

```
  8.8418e-10


ans(:,:,23) =

  7.6651e-10

ans(:,:,24) =

  2.8492e-10

ans(:,:,25) =

  6.1528e-11

ans(:,:,26) =

  4.3168e-10

ans(:,:,27) =

 -2.8789e-10

ans(:,:,28) =

  6.1716e-10

ans(:,:,29) =

  2.6780e-10


ans(:,:,30) =

  5.6596e-10

ans(:,:,31) =

 -4.2421e-10

ans(:,:,32) =

  2.1446e-10

ans(:,:,33) =

 -4.3285e-10
```

```
ans(:,:,1,4) =

   -0.0564   -0.0047    0.0135    0.0400
0.0509    0.0522   -0.0098
    0.0111    0.0417    0.0339    0.0406
0.0248    0.0425    0.0407
    0.0103    0.0153    0.0543   -0.0261
-0.0108    0.0309    0.0326
    0.0300    0.0336    0.0367   -0.0089
-0.0003   -0.0286    0.0332
   -0.0295    0.0500   -0.0124    0.0088
0.0066    0.0283    0.0183
   -0.0098    0.0210    0.0452   -0.0144
-0.0375    0.0164   -0.0137
    0.0333    0.0470    0.0205    0.0208
-0.0553   -0.0599    0.0285


ans(:,:,2,4) =

   -0.0561   -0.0222    0.0252    0.0395
0.0303    0.0033    0.0391
    0.0121   -0.0041    0.0538    0.0518
0.0140    0.0107   -0.0059
   -0.0105    0.0069   -0.0023   -0.0199
-0.0023    0.0438   -0.0028
   -0.0052    0.0581    0.0165   -0.0024
0.0281    0.0204   -0.0090
    0.0016    0.0470    0.0453   -0.0284
-0.0237   -0.0091    0.0389
    0.0286   -0.0250   -0.0250    0.0218
-0.0225   -0.0334    0.0271
    0.0363    0.0283   -0.0100   -0.0543
-0.0420   -0.0322   -0.0331


ans(:,:,3,4) =

   -0.0344    0.0113    0.0213    0.0007
0.0530    0.0419    0.0686
    0.0113   -0.0045    0.0339   -0.0195
0.0308   -0.0029   -0.0010
    0.0425    0.0124    0.0200   -0.0042
0.0293    0.0072    0.0337
   -0.0123    0.0339    0.0119    0.0317
-0.0333    0.0263   -0.0103
   -0.0135    0.0449   -0.0082    0.0157
-0.0366   -0.0075    0.0140
    0.0417    0.0393    0.0012   -0.0036
0.0135    0.0083   -0.0230
   -0.0102    0.0221   -0.0104   -0.0601
-0.0011   -0.0370   -0.0254


ans(:,:,1,5) =
```

```
ans(:,:,34) =

  4.3792e-10


ans(:,:,35) =

  1.0296e-09


ans(:,:,36) =

 -3.9954e-10


ans(:,:,37) =

  2.3627e-10


ans(:,:,38) =

  1.7206e-10


ans(:,:,39) =

  4.0136e-10


ans(:,:,40) =

  6.8313e-10


ans(:,:,41) =

  6.5211e-10


ans(:,:,42) =

  1.4209e-10


ans(:,:,43) =

 -2.3432e-10


ans(:,:,44) =

  4.2423e-10
```

```
    0.0423    0.0038    0.0080    0.0548
-0.0046    0.0559   -0.0222
    0.0379   -0.0015    0.0259    0.0297
0.0489    0.0224    0.0163
   -0.0144    0.0600   -0.0005   -0.0238
-0.0286    0.0198    0.0292
   -0.0261    0.0327    0.0492    0.0272
-0.0269    0.0043   -0.0345
    0.0302   -0.0179    0.0300   -0.0024
0.0116    0.0440    0.0244
    0.0201    0.0166    0.0059   -0.0031
0.0059    0.0115   -0.0340
   -0.0066   -0.0121   -0.0221   -0.0068
0.0437   -0.0291   -0.0316


ans(:,:,2,5) =

    0.0565    0.0011    0.0487    0.0259
0.0499    0.0163    0.0132
    0.0024    0.0218    0.0044    0.0746
0.0025    0.0492   -0.0157
    0.0120   -0.0072    0.0525    0.0309
-0.0043    0.0357    0.0377
    0.0009    0.0408   -0.0001   -0.0250
0.0270   -0.0002    0.0155
    0.0003    0.0118    0.0234   -0.0061
0.0239    0.0156   -0.0211
   -0.0170    0.0242    0.0217    0.0302
0.0031    0.0134    0.0011
    0.0287   -0.0127    0.0296    0.0162
0.0200   -0.0261   -0.0242


ans(:,:,3,5) =

    0.0140    0.0115    0.0488    0.0765
0.0450    0.0126    0.0427
    0.0494    0.0161    0.0190    0.0150
0.0133    0.0194    0.0305
    0.0170    0.0617    0.0680    0.0046
0.0125   -0.0236    0.0044
   -0.0059    0.0242   -0.0201    0.0402
0.0288    0.0276   -0.0081
   -0.0200    0.0293   -0.0206    0.0302
-0.0032    0.0132   -0.0195
    0.0142   -0.0241    0.0439   -0.0344
-0.0235   -0.0350    0.0226
   -0.0322   -0.0271    0.0191    0.0365
0.0436   -0.0287   -0.0331


ans(:,:,1,6) =

   -0.0130   -0.0153    0.0271   -0.0417
-0.0177    0.0159    0.0135
```

```
ans(:,:,45) =

  5.9869e-10


ans(:,:,46) =

  1.2344e-10


ans(:,:,47) =

  4.0838e-10


ans(:,:,48) =

 -8.3573e-10


ans(:,:,49) =

 -1.0337e-09


ans(:,:,50) =

 -8.3291e-11


ans(:,:,51) =

 -1.4597e-10


ans(:,:,52) =

  6.1066e-10


ans(:,:,53) =

  1.7308e-10


ans(:,:,54) =

  5.4837e-10


ans(:,:,55) =

  3.9214e-10


ans(:,:,56) =
```

```
    0.0192   -0.0322    0.0005   -0.0200
0.0096    0.0212   -0.0170
   -0.0386   -0.0202   -0.0371    0.0003
-0.0249   -0.0147    0.0257
   -0.0217    0.0220   -0.0238    0.0161
-0.0467    0.0367    0.0339
    0.0274   -0.0077    0.0014   -0.0351
0.0306    0.0180   -0.0033
   -0.0419   -0.0080   -0.0378   -0.0451
-0.0322   -0.0436    0.0196
   -0.0387    0.0144   -0.0336   -0.0334
-0.0003   -0.0393    0.0070


ans(:,:,2,6) =

   -0.0452    0.0283   -0.0246   -0.0411
-0.0123    0.0387    0.0182
   -0.0421    0.0077   -0.0419    0.0258
0.0023    0.0026    0.0346
   -0.0348   -0.0274    0.0079   -0.0003
-0.0365   -0.0136    0.0426
    0.0065   -0.0219   -0.0398   -0.0387
-0.0393   -0.0401    0.0192
    0.0164   -0.0475   -0.0351   -0.0490
-0.0012   -0.0312    0.0194
   -0.0108    0.0036   -0.0311   -0.0189
0.0199    0.0084   -0.0375
    0.0109   -0.0423    0.0064   -0.0362
0.0235   -0.0212   -0.0231


ans(:,:,3,6) =

    0.0114   -0.0138    0.0036   -0.0327
-0.0280    0.0353    0.0335
   -0.0298    0.0216   -0.0027    0.0034
-0.0136    0.0056    0.0238
   -0.0420   -0.0090   -0.0079   -0.0377
-0.0441    0.0248   -0.0045
   -0.0369   -0.0141   -0.0074    0.0129
-0.0178    0.0322    0.0409
    0.0017   -0.0180   -0.0089    0.0300
0.0026   -0.0181   -0.0269
   -0.0167   -0.0032   -0.0276    0.0110
-0.0433   -0.0382    0.0072
   -0.0246   -0.0107   -0.0100   -0.0351
-0.0148    0.0080    0.0309


ans(:,:,1,7) =

   -0.0398   -0.0175    0.0086    0.0008
0.0397    0.0367    0.0551
   -0.0288    0.0202   -0.0264   -0.0126
-0.0081    0.0245    0.0476
```

```
  8.7837e-10


ans(:,:,57) =

  2.2101e-10


ans(:,:,58) =

  6.1246e-10


ans(:,:,59) =

 -3.3195e-10


ans(:,:,60) =

 -6.3985e-10


ans(:,:,61) =

  5.3441e-10


ans(:,:,62) =

  8.7308e-10


ans(:,:,63) =

  4.5698e-10


ans(:,:,64) =

  3.7422e-10
```

```
   -0.0085   -0.0008    0.0209    0.0123
0.0476    0.0281   -0.0142
    0.0604    0.0489    0.0003    0.0112
-0.0212    0.0314    0.0098
    0.0298    0.0072   -0.0153    0.0164
0.0215    0.0574    0.0467
   -0.0239   -0.0040   -0.0124    0.0157
-0.0112   -0.0051    0.0600
    0.0268   -0.0290    0.0092   -0.0103
0.0397    0.0378   -0.0071


ans(:,:,2,7) =

    0.0032   -0.0155   -0.0379    0.0417
0.0462    0.0101    0.0143
   -0.0360   -0.0398    0.0345   -0.0199
-0.0189   -0.0198    0.0650
    0.0318   -0.0085   -0.0233    0.0082
-0.0135    0.0609    0.0296
    0.0228    0.0216    0.0190    0.0436
0.0044    0.0277   -0.0186
    0.0389    0.0286   -0.0229   -0.0063
0.0088    0.0454    0.0609
    0.0492    0.0214   -0.0295    0.0021
0.0398    0.0193    0.0162
   -0.0155   -0.0116    0.0421    0.0238
0.0277   -0.0109    0.0313


ans(:,:,3,7) =

    0.0048    0.0252   -0.0157   -0.0287
0.0417   -0.0136   -0.0115
   -0.0415   -0.0425    0.0355   -0.0317
-0.0272    0.0452    0.0113
   -0.0226    0.0363   -0.0365   -0.0414
-0.0072    0.0096    0.0068
   -0.0201    0.0267    0.0397    0.0336
-0.0181   -0.0058   -0.0163
    0.0602    0.0522   -0.0059    0.0366
0.0495   -0.0144    0.0320
    0.0349   -0.0195    0.0001    0.0122
0.0365    0.0050    0.0530
   -0.0167   -0.0216    0.0256    0.0100
0.0486    0.0441   -0.0114


ans(:,:,1,8) =

    0.0006    0.0074    0.0481    0.0151
-0.0236    0.0357   -0.0294
   -0.0166    0.0487   -0.0318    0.0185
-0.0181    0.0223   -0.0112
    0.0466    0.0294    0.0297    0.0273
-0.0062    0.0205    0.0165
```

```
    0.0523    0.0596   -0.0316    0.0055
0.0334    0.0062   -0.0157
    0.0060    0.0283   -0.0034    0.0294
-0.0429   -0.0109   -0.0357
    0.0637    0.0456    0.0148    0.0222
0.0288    0.0322    0.0119
    0.0503    0.0491    0.0176   -0.0320
-0.0353   -0.0465    0.0020


ans(:,:,2,8) =

    0.0203    0.0206    0.0196   -0.0264
0.0194    0.0313    0.0228
    0.0444    0.0477    0.0072    0.0075
-0.0022    0.0154   -0.0374
    0.0577    0.0604   -0.0232    0.0393
-0.0308   -0.0380   -0.0048
    0.0710    0.0576   -0.0131   -0.0099
0.0132   -0.0469   -0.0275
    0.0045    0.0105   -0.0231    0.0075
0.0161   -0.0436   -0.0099
    0.0475    0.0101    0.0321   -0.0271
0.0181    0.0114   -0.0143
    0.0331   -0.0176   -0.0111   -0.0202
-0.0181    0.0136   -0.0280


ans(:,:,3,8) =

    0.0236    0.0213    0.0228   -0.0200
-0.0337    0.0414    0.0071
    0.0686   -0.0157    0.0475    0.0315
0.0242   -0.0102    0.0201
    0.0377    0.0075   -0.0030   -0.0073
0.0009   -0.0583   -0.0028
    0.0714    0.0471    0.0066    0.0423
0.0222    0.0302   -0.0206
    0.0206    0.0153   -0.0292    0.0100
-0.0195   -0.0350   -0.0263
    0.0346    0.0110   -0.0201   -0.0425
-0.0062   -0.0469   -0.0513
    0.0715    0.0490   -0.0212   -0.0283
0.0334   -0.0035   -0.0455


ans(:,:,1,9) =

   -0.0246    0.0219    0.0108    0.0310
0.0457    0.0044   -0.0245
    0.0397    0.0294   -0.0012    0.0478
-0.0030    0.0213    0.0020
    0.0401    0.0196   -0.0131    0.0013
-0.0202   -0.0194    0.0462
    0.0332    0.0123   -0.0233    0.0300
0.0175    0.0536    0.0536
```

```
    0.0024    0.0485    0.0194   -0.0367
0.0299    0.0244    0.0575
    0.0217   -0.0210    0.0018   -0.0117
0.0175   -0.0212    0.0285
    0.0234   -0.0291    0.0222    0.0248
-0.0118    0.0525    0.0153


ans(:,:,2,9) =

    0.0287    0.0578    0.0168   -0.0111
0.0187    0.0584    0.0177
   -0.0153    0.0294    0.0009    0.0123
0.0000    0.0087    0.0408
    0.0188    0.0463    0.0269   -0.0128
0.0231    0.0487    0.0440
    0.0069    0.0210    0.0354   -0.0109
-0.0024    0.0309   -0.0033
   -0.0082   -0.0345   -0.0424    0.0317
0.0342   -0.0195   -0.0132
   -0.0005    0.0102    0.0236    0.0096
-0.0112    0.0475    0.0065
   -0.0017   -0.0347   -0.0388   -0.0089
-0.0077    0.0560    0.0159


ans(:,:,3,9) =

   -0.0115    0.0113    0.0357   -0.0004
0.0192    0.0262    0.0237
    0.0109    0.0446    0.0112    0.0070
0.0266   -0.0218   -0.0184
    0.0089    0.0398   -0.0350    0.0344
-0.0174   -0.0141   -0.0027
    0.0285    0.0279   -0.0057    0.0273
-0.0008   -0.0109    0.0307
    0.0068   -0.0066    0.0222   -0.0489
-0.0068    0.0140    0.0199
    0.0191   -0.0123   -0.0168   -0.0455
-0.0101   -0.0236   -0.0236
    0.0005    0.0111   -0.0028    0.0299
-0.0008    0.0463    0.0161


ans(:,:,1,10) =

   -0.0495   -0.0200    0.0183   -0.0221
-0.0001   -0.0276   -0.0043
   -0.0012    0.0213    0.0178   -0.0171
-0.0300   -0.0195    0.0251
   -0.0145   -0.0227    0.0020   -0.0011
-0.0261    0.0149   -0.0530
   -0.0091   -0.0026    0.0231   -0.0052
0.0143   -0.0109   -0.0422
   -0.0205   -0.0384   -0.0042    0.0098
-0.0297    0.0181   -0.0042
```

```
    0.0155   -0.0351   -0.0532   -0.0283
-0.0365    0.0251    0.0010
    0.0204   -0.0130   -0.0124   -0.0181
-0.0463   -0.0664   -0.0027


ans(:,:,2,10) =

    0.0207   -0.0162    0.0133   -0.0267
0.0149    0.0425   -0.0232
    0.0297    0.0074   -0.0143   -0.0187
0.0233   -0.0329   -0.0128
   -0.0395    0.0067   -0.0273    0.0038
-0.0378    0.0182    0.0113
    0.0117   -0.0542   -0.0305   -0.0245
0.0253   -0.0304   -0.0196
   -0.0116    0.0298    0.0126   -0.0371
0.0104   -0.0375   -0.0484
    0.0158    0.0255   -0.0458   -0.0269
-0.0275   -0.0421    0.0139
   -0.0296   -0.0255   -0.0365   -0.0607
-0.0426   -0.0278   -0.0387


ans(:,:,3,10) =

    0.0094    0.0266   -0.0348   -0.0083
0.0165    0.0070   -0.0180
   -0.0442    0.0301   -0.0514    0.0277
0.0422    0.0237   -0.0318
    0.0265   -0.0569    0.0093   -0.0026
0.0121    0.0148    0.0076
   -0.0456    0.0126   -0.0081    0.0284
0.0096   -0.0135    0.0228
   -0.0499   -0.0382   -0.0138   -0.0369
-0.0191    0.0011   -0.0140
   -0.0075    0.0284   -0.0137   -0.0190
-0.0437    0.0247    0.0246
    0.0196   -0.0091    0.0027   -0.0370
0.0028    0.0114    0.0113


ans(:,:,1,11) =

    0.0079   -0.0066    0.0554    0.0145
0.0378    0.0049   -0.0517
   -0.0172    0.0352    0.0161    0.0416
0.0318   -0.0501    0.0216
   -0.0048   -0.0031    0.0541    0.0214
0.0200    0.0238   -0.0134
    0.0153    0.0432   -0.0059    0.0291
0.0266   -0.0174   -0.0172
    0.0147   -0.0360    0.0293    0.0294
-0.0251   -0.0081    0.0201
   -0.0111   -0.0216    0.0374    0.0141
0.0242    0.0049    0.0030
```

```
   -0.0091    0.0303    0.0544   -0.0052
-0.0016   -0.0186    0.0279


ans(:,:,2,11) =

    0.0444    0.0514    0.0227    0.0485
-0.0144   -0.0299    0.0262
    0.0234    0.0062    0.0593   -0.0104
-0.0072   -0.0080   -0.0279
   -0.0034    0.0120    0.0062   -0.0307
0.0144   -0.0203   -0.0151
   -0.0167    0.0041   -0.0096    0.0064
-0.0142    0.0123    0.0176
   -0.0325   -0.0108    0.0237    0.0442
-0.0255   -0.0178    0.0184
    0.0090   -0.0002    0.0148   -0.0046
0.0041   -0.0150   -0.0307
    0.0060   -0.0138    0.0066    0.0283
-0.0328    0.0121   -0.0180


ans(:,:,3,11) =

    0.0447    0.0540    0.0036    0.0314
0.0367    0.0057   -0.0059
   -0.0051    0.0149    0.0372    0.0092
-0.0271    0.0254   -0.0274
    0.0217    0.0365    0.0103   -0.0225
0.0261    0.0098   -0.0062
    0.0368   -0.0156    0.0439    0.0187
0.0277   -0.0220   -0.0220
    0.0480    0.0205    0.0357    0.0324
-0.0140   -0.0343   -0.0193
    0.0448   -0.0149    0.0123    0.0495
-0.0068   -0.0417   -0.0315
    0.0075    0.0392    0.0234    0.0314
0.0238    0.0355   -0.0273


ans(:,:,1,12) =

    0.0104    0.0320   -0.0410    0.0231
0.0136   -0.0407    0.0286
    0.0363   -0.0001    0.0277   -0.0068
0.0018   -0.0460    0.0174
   -0.0002   -0.0054   -0.0291    0.0030
-0.0050    0.0170    0.0232
    0.0416   -0.0131   -0.0312    0.0180
-0.0258    0.0162   -0.0047
    0.0417    0.0117   -0.0015   -0.0149
0.0044    0.0213   -0.0198
    0.0137    0.0069   -0.0078    0.0406
0.0388    0.0168    0.0178
   -0.0226    0.0243    0.0106    0.0327
0.0293   -0.0298    0.0195
```

```
ans(:,:,2,12) =

    0.0190    0.0360   -0.0049    0.0166
-0.0104   -0.0406    0.0105
   -0.0318    0.0191    0.0382    0.0332
0.0100    0.0014    0.0283
   -0.0093   -0.0012    0.0077    0.0471
-0.0015    0.0355   -0.0216
    0.0009    0.0218   -0.0023    0.0425
0.0198   -0.0240    0.0330
    0.0130    0.0223    0.0491    0.0422
0.0163   -0.0129    0.0134
    0.0243   -0.0047    0.0627   -0.0031
0.0467   -0.0031    0.0389
    0.0105   -0.0165   -0.0096    0.0440
0.0531   -0.0001    0.0007


ans(:,:,3,12) =

    0.0192    0.0128   -0.0277    0.0281
-0.0098    0.0237    0.0056
   -0.0150    0.0217   -0.0106   -0.0180
-0.0353   -0.0442   -0.0288
    0.0001    0.0209    0.0341    0.0320
-0.0052    0.0187    0.0409
    0.0526    0.0429    0.0233    0.0325
0.0089    0.0110   -0.0032
    0.0399    0.0014    0.0437   -0.0117
0.0482   -0.0143    0.0050
   -0.0121    0.0608    0.0473    0.0242
0.0372   -0.0240   -0.0234
   -0.0160    0.0177    0.0245    0.0184
0.0371   -0.0222    0.0471


ans(:,:,1,13) =

    0.0230   -0.0096   -0.0346    0.0263
0.0069    0.0244   -0.0387
   -0.0400    0.0065    0.0093    0.0528
-0.0054    0.0436   -0.0007
   -0.0122    0.0352    0.0103    0.0349
0.0041   -0.0160    0.0032
   -0.0041   -0.0512    0.0042    0.0124
0.0105    0.0228   -0.0340
    0.0219   -0.0042   -0.0637    0.0021
0.0033   -0.0395    0.0226
   -0.0403    0.0115   -0.0236   -0.0819
-0.0682    0.0296   -0.0336
   -0.0675    0.0077   -0.0437    0.0024
0.0214    0.0442    0.0513


ans(:,:,2,13) =
```

```
   -0.0070    0.0070   -0.0439    0.0007
0.0078   -0.0080   -0.0149
   -0.0039    0.0358    0.0131    0.0117
0.0595    0.0247   -0.0082
   -0.0094   -0.0174   -0.0373   -0.0168
0.0116    0.0424    0.0332
   -0.0416    0.0211    0.0000   -0.0354
-0.0487    0.0186    0.0135
   -0.0582    0.0206   -0.0328   -0.0171
-0.0341    0.0065   -0.0082
    0.0175   -0.0275   -0.0647   -0.0642
-0.0294   -0.0335    0.0230
   -0.0540   -0.0723   -0.0603   -0.0241
-0.0255    0.0312    0.0277


ans(:,:,3,13) =

    0.0117   -0.0156    0.0076   -0.0243
0.0257    0.0042   -0.0138
    0.0132    0.0083    0.0122    0.0129
0.0066    0.0032    0.0197
   -0.0351   -0.0407    0.0139   -0.0117
0.0443    0.0397   -0.0151
   -0.0477   -0.0012   -0.0440   -0.0330
0.0127   -0.0462    0.0164
   -0.0245    0.0150   -0.0268   -0.0265
-0.0050   -0.0127    0.0382
   -0.0457   -0.0480   -0.0103   -0.0507
-0.0096    0.0109    0.0127
   -0.0045   -0.0671   -0.0005   -0.0067
-0.0389    0.0289    0.0456


ans(:,:,1,14) =

   -0.0691   -0.0480   -0.0541   -0.0170
0.0326    0.0199    0.0048
   -0.0174   -0.0298    0.0044    0.0282
0.0299    0.0586    0.0555
   -0.0398   -0.0161   -0.0145    0.0112
0.0480    0.0146    0.0463
    0.0110   -0.0226   -0.0416   -0.0157
0.0211   -0.0168    0.0067
   -0.0117    0.0337   -0.0286    0.0262
0.0383    0.0413   -0.0050
   -0.0224    0.0207    0.0325    0.0402
0.0286    0.0233    0.0406
   -0.0582    0.0095    0.0248    0.0401
0.0158   -0.0177    0.0062


ans(:,:,2,14) =

   -0.0467   -0.0464    0.0030    0.0320
0.0493    0.0679    0.0603
```

```
   -0.0620   -0.0193   -0.0092   -0.0260
0.0362   -0.0020    0.0295
   -0.0299   -0.0191   -0.0377   -0.0448
0.0122   -0.0127   -0.0145
   -0.0271    0.0280    0.0227   -0.0086
-0.0387    0.0260    0.0328
   -0.0284    0.0183   -0.0161    0.0314
0.0340    0.0117    0.0547
   -0.0415    0.0224    0.0367   -0.0003
0.0146    0.0467    0.0090
   -0.0010   -0.0284   -0.0134    0.0202
0.0059    0.0651    0.0129


ans(:,:,3,14) =

   -0.0174    0.0161    0.0082   -0.0249
0.0038    0.0657    0.0173
    0.0087   -0.0001    0.0111   -0.0387
0.0349    0.0414    0.0357
   -0.0031   -0.0202    0.0240   -0.0120
-0.0248    0.0118    0.0638
   -0.0122   -0.0295   -0.0488    0.0274
0.0280    0.0249    0.0519
   -0.0020    0.0158    0.0134   -0.0055
0.0022    0.0152    0.0516
   -0.0442   -0.0051    0.0216   -0.0017
-0.0008    0.0010    0.0029
   -0.0544   -0.0417   -0.0103   -0.0236
0.0511    0.0657    0.0443


ans(:,:,1,15) =

   -0.0014    0.0245    0.0272    0.0054
0.0225    0.0338    0.0091
    0.0217   -0.0032    0.0026    0.0416
0.0220    0.0186    0.0304
   -0.0168   -0.0484    0.0210    0.0144
0.0351   -0.0037    0.0275
    0.0083    0.0029    0.0413    0.0287
0.0280    0.0241   -0.0117
   -0.0456   -0.0451    0.0127    0.0299
-0.0353   -0.0206    0.0224
   -0.0083   -0.0203    0.0139    0.0103
-0.0010   -0.0237   -0.0178
   -0.0435   -0.0190   -0.0081   -0.0102
-0.0199    0.0263    0.0581


ans(:,:,2,15) =

   -0.0407   -0.0354   -0.0345   -0.0033
0.0366   -0.0200    0.0419
    0.0046   -0.0276    0.0233    0.0008
0.0428    0.0304    0.0555
```

```
   -0.0057   -0.0129   -0.0385   -0.0377
-0.0083    0.0424    0.0284
   -0.0464    0.0317   -0.0423   -0.0097
-0.0302   -0.0126    0.0312
   -0.0359    0.0050   -0.0369    0.0184
-0.0412   -0.0115    0.0582
    0.0008    0.0135    0.0092   -0.0382
-0.0039    0.0411    0.0044
   -0.0496   -0.0125   -0.0588    0.0074
0.0168    0.0207    0.0011


ans(:,:,3,15) =

   -0.0388   -0.0420   -0.0095    0.0431
-0.0084    0.0317    0.0185
   -0.0480   -0.0028    0.0318    0.0284
-0.0353    0.0445    0.0351
   -0.0200   -0.0242   -0.0176    0.0216
0.0132    0.0117    0.0580
    0.0118    0.0102   -0.0313   -0.0160
0.0202    0.0378    0.0451
   -0.0225   -0.0193    0.0328   -0.0033
0.0076   -0.0055    0.0655
   -0.0260    0.0076   -0.0596   -0.0332
-0.0458   -0.0306    0.0303
   -0.0203   -0.0386   -0.0341    0.0099
-0.0148   -0.0203    0.0407


ans(:,:,1,16) =

    0.0105   -0.0556    0.0148   -0.0043
-0.0108    0.0149   -0.0129
    0.0143   -0.0090    0.0242    0.0067
0.0402    0.0444    0.0315
   -0.0284   -0.0370    0.0271    0.0388
-0.0071   -0.0008    0.0028
   -0.0355    0.0178    0.0232    0.0206
-0.0222   -0.0323    0.0150
   -0.0575   -0.0089   -0.0358    0.0125
0.0032   -0.0170    0.0221
   -0.0167   -0.0146   -0.0552    0.0208
0.0374    0.0095    0.0012
   -0.0826   -0.0840   -0.0061   -0.0102
0.0329    0.0195    0.0346


ans(:,:,2,16) =

    0.0193   -0.0336   -0.0595   -0.0313
0.0142    0.0552    0.0346
    0.0261   -0.0126    0.0066   -0.0245
-0.0188    0.0316    0.0480
   -0.0275   -0.0102    0.0235   -0.0240
0.0141    0.0218   -0.0138
```

```
   -0.0572   -0.0220   -0.0037   -0.0272
0.0463    0.0018   -0.0533
   -0.0174   -0.0168   -0.0080    0.0253
0.0367    0.0192   -0.0586
   -0.0541   -0.0308    0.0080    0.0204
0.0327   -0.0306    0.0262
   -0.0573   -0.0769   -0.0232   -0.0088
0.0250    0.0341    0.0005


ans(:,:,3,16) =

   -0.0232   -0.0146   -0.0338   -0.0480
-0.0113    0.0358    0.0240
   -0.0277    0.0197   -0.0276   -0.0177
0.0547    0.0014   -0.0142
   -0.0339   -0.0307   -0.0047    0.0496
0.0229    0.0316    0.0371
   -0.0158    0.0061    0.0070    0.0086
0.0278   -0.0134   -0.0437
   -0.0523   -0.0379    0.0255   -0.0207
0.0378   -0.0333   -0.0135
    0.0080   -0.0262   -0.0462   -0.0406
0.0083    0.0428   -0.0177
   -0.0715   -0.0641   -0.0058    0.0383
-0.0218    0.0013    0.0051


ans(:,:,1,17) =

   -0.0482   -0.0231    0.0177   -0.0258
0.0036   -0.0235    0.0287
   -0.0596    0.0121    0.0106   -0.0148
-0.0251    0.0191    0.0284
    0.0068   -0.0173    0.0162    0.0244
-0.0238    0.0081   -0.0212
   -0.0418   -0.0014   -0.0284    0.0253
-0.0327   -0.0438   -0.0111
    0.0048    0.0013   -0.0126   -0.0300
0.0257    0.0082    0.0102
   -0.0309   -0.0433   -0.0450   -0.0198
0.0038   -0.0548   -0.0435
   -0.0290    0.0038    0.0202   -0.0249
0.0036   -0.0104   -0.0249


ans(:,:,2,17) =

    0.0026   -0.0659    0.0090   -0.0293
0.0216    0.0481   -0.0324
    0.0054   -0.0022    0.0216   -0.0251
-0.0309    0.0185   -0.0094
   -0.0315   -0.0077   -0.0018    0.0363
-0.0031    0.0280    0.0152
    0.0136    0.0238    0.0172    0.0137
-0.0441   -0.0014   -0.0054
```

```
   -0.0199    0.0222   -0.0301    0.0030
-0.0520   -0.0497   -0.0645
   -0.0257   -0.0331    0.0184   -0.0362
-0.0437   -0.0546    0.0085
   -0.0093   -0.0240    0.0258   -0.0510
-0.0230   -0.0183   -0.0089


ans(:,:,3,17) =

   -0.0208   -0.0527   -0.0391    0.0161
0.0085    0.0037   -0.0126
    0.0073    0.0089    0.0110    0.0444
0.0517   -0.0137    0.0167
   -0.0558   -0.0019    0.0130    0.0123
0.0293   -0.0283   -0.0285
   -0.0356    0.0226    0.0044   -0.0431
0.0258    0.0125   -0.0565
   -0.0455    0.0242   -0.0052   -0.0148
0.0242   -0.0521   -0.0623
    0.0241   -0.0048   -0.0497   -0.0512
-0.0175   -0.0435    0.0083
    0.0267   -0.0150    0.0061   -0.0092
-0.0361   -0.0064   -0.0691


ans(:,:,1,18) =

    0.0433   -0.0197   -0.0461    0.0072
-0.0383   -0.0122   -0.0518
   -0.0225   -0.0207   -0.0103    0.0133
-0.0306   -0.0610   -0.0645
   -0.0208    0.0354    0.0382   -0.0359
-0.0040   -0.0345   -0.0576
    0.0461    0.0034    0.0175    0.0301
-0.0435    0.0023    0.0052
    0.0290   -0.0376   -0.0204    0.0103
-0.0281    0.0007    0.0033
   -0.0425   -0.0450   -0.0047   -0.0163
0.0352   -0.0348   -0.0215
   -0.0296    0.0004    0.0108    0.0150
0.0276   -0.0090   -0.0113


ans(:,:,2,18) =

   -0.0106    0.0193   -0.0267   -0.0255
0.0165    0.0060   -0.0300
    0.0239    0.0058    0.0091   -0.0041
-0.0249   -0.0007   -0.0540
    0.0438    0.0401   -0.0314    0.0224
-0.0364   -0.0131    0.0093
    0.0014   -0.0293   -0.0047    0.0342
-0.0057    0.0220   -0.0406
    0.0271   -0.0085   -0.0117   -0.0068
-0.0300   -0.0359   -0.0469
```

```
   -0.0208   -0.0303    0.0010   -0.0399
-0.0491   -0.0108   -0.0120
   -0.0045   -0.0169   -0.0122   -0.0097
-0.0206   -0.0238    0.0213


ans(:,:,3,18) =

    0.0440   -0.0252   -0.0439   -0.0269
0.0000    0.0031   -0.0273
    0.0356   -0.0061    0.0170   -0.0542
0.0085   -0.0303   -0.0587
   -0.0225    0.0338   -0.0147   -0.0264
0.0118    0.0196    0.0212
   -0.0361   -0.0026   -0.0250   -0.0381
-0.0196   -0.0009    0.0103
   -0.0314   -0.0382   -0.0424   -0.0238
-0.0175   -0.0354    0.0209
   -0.0247   -0.0152   -0.0079    0.0272
-0.0451   -0.0333    0.0186
   -0.0202   -0.0016   -0.0240    0.0243
-0.0251    0.0100   -0.0351


ans(:,:,1,19) =

   -0.0316   -0.0346   -0.0056    0.0325
0.0301    0.0062    0.0659
   -0.0169   -0.0130    0.0171   -0.0148
0.0304    0.0420    0.0076
    0.0281    0.0115    0.0517    0.0317
0.0574    0.0507    0.0507
    0.0310    0.0087    0.0418    0.0336
-0.0155   -0.0236    0.0520
   -0.0387   -0.0389   -0.0021    0.0227
-0.0123    0.0293   -0.0080
   -0.0172   -0.0107   -0.0101    0.0174
0.0489   -0.0264    0.0087
   -0.0086    0.0032    0.0111    0.0383
-0.0126    0.0093   -0.0317


ans(:,:,2,19) =

    0.0072    0.0343    0.0064    0.0304
0.0283   -0.0045    0.0132
    0.0384    0.0114    0.0140    0.0228
-0.0032    0.0563    0.0421
   -0.0060    0.0375    0.0229    0.0208
-0.0066    0.0613    0.0374
    0.0149    0.0256   -0.0050    0.0067
0.0511    0.0090    0.0387
   -0.0407   -0.0346   -0.0236    0.0324
-0.0012    0.0181   -0.0216
   -0.0284    0.0060   -0.0424    0.0217
0.0182   -0.0290    0.0295
```

```
    0.0078    0.0026    0.0264    0.0412
0.0248    0.0146    0.0077


ans(:,:,3,19) =

    0.0178    0.0040   -0.0001    0.0293
-0.0152    0.0008    0.0305
    0.0078    0.0192    0.0035    0.0546
-0.0158   -0.0001   -0.0113
   -0.0308    0.0102    0.0491   -0.0157
-0.0033    0.0524   -0.0110
   -0.0423   -0.0205   -0.0169    0.0058
-0.0045    0.0496   -0.0104
   -0.0205    0.0033   -0.0007    0.0386
0.0239    0.0098    0.0232
   -0.0138    0.0328    0.0033    0.0400
-0.0250    0.0092    0.0264
   -0.0391   -0.0137    0.0102    0.0006
0.0161    0.0225   -0.0118


ans(:,:,1,20) =

    0.0191   -0.0001    0.0483    0.0132
-0.0006    0.0074    0.0022
   -0.0163    0.0305    0.0137   -0.0230
0.0384    0.0205   -0.0183
    0.0098    0.0360   -0.0344   -0.0110
-0.0331    0.0183    0.0495
   -0.0092   -0.0384   -0.0352    0.0074
0.0242   -0.0039    0.0272
   -0.0279   -0.0039    0.0185    0.0022
0.0156    0.0053   -0.0142
    0.0411    0.0078   -0.0202    0.0481
0.0066    0.0198    0.0620
   -0.0029   -0.0160    0.0497    0.0466
0.0257    0.0335    0.0101


ans(:,:,2,20) =

   -0.0384   -0.0332    0.0229    0.0295
-0.0118    0.0190    0.0161
    0.0228   -0.0187    0.0116    0.0151
-0.0314    0.0353   -0.0278
    0.0322   -0.0275    0.0312   -0.0050
0.0211    0.0078    0.0489
    0.0057    0.0199    0.0101   -0.0326
-0.0335    0.0480    0.0201
   -0.0275   -0.0384    0.0502   -0.0142
0.0280    0.0107    0.0390
    0.0158    0.0059    0.0512    0.0603
-0.0105    0.0234    0.0069
    0.0131    0.0239    0.0050   -0.0180
0.0100   -0.0027    0.0402
```

```
ans(:,:,3,20) =

   -0.0077    0.0367   -0.0198    0.0212
-0.0059    0.0144   -0.0063
    0.0204    0.0047    0.0050    0.0405
-0.0183    0.0333    0.0113
    0.0224    0.0060    0.0308   -0.0208
0.0012   -0.0142    0.0126
    0.0290   -0.0023   -0.0175    0.0470
-0.0143    0.0164   -0.0048
   -0.0360   -0.0268    0.0404    0.0179
0.0228    0.0240    0.0132
   -0.0083   -0.0142    0.0360    0.0475
0.0092    0.0533    0.0511
   -0.0004    0.0032    0.0016    0.0001
0.0057    0.0466    0.0027


ans(:,:,1,21) =

   -0.0227    0.0232   -0.0339   -0.0186
0.0242   -0.0314    0.0096
   -0.0123    0.0098   -0.0214   -0.0206
-0.0139   -0.0087   -0.0310
   -0.0337   -0.0310    0.0059    0.0223
-0.0261    0.0170    0.0264
    0.0149    0.0005   -0.0353    0.0071
-0.0072   -0.0219    0.0145
   -0.0343   -0.0135    0.0042   -0.0400
0.0349    0.0187    0.0171
   -0.0428   -0.0146   -0.0445    0.0267
0.0073   -0.0346    0.0047
    0.0052   -0.0465   -0.0482    0.0287
-0.0366   -0.0267   -0.0340


ans(:,:,2,21) =

   -0.0331   -0.0033    0.0280    0.0322
0.0092   -0.0494   -0.0162
   -0.0275   -0.0071    0.0042    0.0095
-0.0399    0.0098   -0.0176
    0.0321    0.0406   -0.0132   -0.0174
-0.0009    0.0204   -0.0354
   -0.0342    0.0105    0.0018   -0.0186
-0.0232    0.0167   -0.0355
   -0.0109   -0.0294    0.0337    0.0094
-0.0299   -0.0169    0.0073
   -0.0169   -0.0453    0.0197   -0.0288
0.0262    0.0042   -0.0447
    0.0094   -0.0047   -0.0217   -0.0223
-0.0023    0.0241   -0.0482


ans(:,:,3,21) =
```

```
    0.0144   -0.0192   -0.0335   -0.0457
0.0029    0.0130   -0.0465
   -0.0306   -0.0286   -0.0312   -0.0022
-0.0291   -0.0462   -0.0182
    0.0330   -0.0281    0.0385   -0.0279
0.0063    0.0102   -0.0306
    0.0115   -0.0194   -0.0189    0.0170
-0.0001    0.0335   -0.0272
   -0.0213   -0.0290   -0.0323   -0.0247
-0.0163    0.0096    0.0277
   -0.0293    0.0201   -0.0110   -0.0064
-0.0435    0.0069   -0.0359
    0.0047   -0.0359   -0.0219   -0.0343
0.0293   -0.0167   -0.0234


ans(:,:,1,22) =

   -0.0292   -0.0010   -0.0366   -0.0482
0.0184   -0.0039    0.0174
    0.0036    0.0070   -0.0389   -0.0360
0.0047   -0.0514    0.0389
   -0.0195   -0.0515   -0.0251    0.0077
-0.0363   -0.0415    0.0106
    0.0156   -0.0448   -0.0072   -0.0075
-0.0357   -0.0113    0.0352
    0.0338   -0.0301   -0.0019   -0.0426
0.0251   -0.0356   -0.0227
   -0.0172    0.0227    0.0187    0.0079
0.0173    0.0162   -0.0197
   -0.0160   -0.0243   -0.0093    0.0218
0.0001    0.0236    0.0117


ans(:,:,2,22) =

   -0.0487    0.0052   -0.0408   -0.0207
-0.0480    0.0099    0.0287
   -0.0521    0.0125   -0.0574   -0.0357
-0.0046   -0.0141   -0.0109
   -0.0010    0.0010   -0.0208    0.0194
-0.0131   -0.0408   -0.0353
   -0.0007    0.0200   -0.0098    0.0297
0.0238   -0.0394   -0.0217
    0.0059   -0.0222   -0.0126    0.0299
-0.0380   -0.0390   -0.0359
   -0.0196    0.0041    0.0152   -0.0273
-0.0090   -0.0385   -0.0364
   -0.0406   -0.0312   -0.0330   -0.0284
0.0121    0.0073    0.0434


ans(:,:,3,22) =

    0.0158   -0.0065   -0.0030    0.0225
-0.0477   -0.0287   -0.0410
```

```
    0.0186   -0.0096   -0.0342    0.0084
-0.0213   -0.0515   -0.0336
   -0.0620   -0.0212   -0.0223   -0.0058
0.0002   -0.0141    0.0005
    0.0110    0.0024   -0.0441    0.0118
0.0104   -0.0399   -0.0220
   -0.0164    0.0173    0.0028    0.0292
0.0305    0.0278    0.0262
    0.0217   -0.0436   -0.0403   -0.0120
0.0183    0.0195   -0.0177
   -0.0446   -0.0346   -0.0477   -0.0182
0.0085    0.0202    0.0286


ans(:,:,1,23) =

    0.0004    0.0125    0.0118    0.0249
0.0108    0.0290   -0.0169
   -0.0244   -0.0030   -0.0103    0.0501
-0.0184    0.0512    0.0029
    0.0391    0.0396   -0.0264    0.0073
-0.0251   -0.0110    0.0267
   -0.0119   -0.0207    0.0194    0.0228
-0.0073   -0.0062    0.0406
   -0.0024    0.0193    0.0559    0.0432
-0.0206    0.0022    0.0404
    0.0373   -0.0051    0.0588   -0.0207
0.0307   -0.0065    0.0268
    0.0468    0.0391   -0.0084   -0.0259
0.0400   -0.0009    0.0227


ans(:,:,2,23) =

   -0.0074   -0.0224   -0.0034    0.0487
0.0054    0.0097    0.0275
   -0.0105   -0.0159    0.0105    0.0186
-0.0226    0.0466    0.0351
   -0.0068   -0.0072    0.0209    0.0121
0.0247    0.0401    0.0432
    0.0112   -0.0154    0.0555   -0.0034
0.0255   -0.0251   -0.0205
   -0.0030    0.0159   -0.0145    0.0047
0.0367    0.0361    0.0464
   -0.0183    0.0265    0.0516    0.0129
-0.0158   -0.0093    0.0387
    0.0183    0.0365    0.0072    0.0081
0.0129    0.0157   -0.0211


ans(:,:,3,23) =

   -0.0035    0.0069    0.0001   -0.0272
0.0443   -0.0090    0.0278
    0.0130    0.0191   -0.0330    0.0054
-0.0195    0.0316    0.0386
```

```
   -0.0184   -0.0029   -0.0208    0.0112
-0.0089    0.0427   -0.0293
    0.0190   -0.0041    0.0038    0.0215
-0.0198    0.0274   -0.0349
    0.0360   -0.0048    0.0308    0.0320
0.0500    0.0270    0.0430
    0.0561    0.0074    0.0606    0.0133
0.0214    0.0176    0.0134
    0.0461    0.0023   -0.0272    0.0371
0.0545    0.0071    0.0109


ans(:,:,1,24) =

   -0.0139    0.0072   -0.0172    0.0234
0.0626    0.0087    0.0044
   -0.0033    0.0486   -0.0216    0.0013
-0.0085   -0.0025    0.0151
    0.0175   -0.0211   -0.0005    0.0203
0.0196   -0.0188   -0.0108
    0.0392    0.0474    0.0497    0.0081
-0.0220   -0.0144    0.0356
    0.0393    0.0001   -0.0330    0.0120
0.0093    0.0094   -0.0332
   -0.0282   -0.0117   -0.0467    0.0059
0.0028   -0.0132    0.0201
   -0.0096    0.0053   -0.0228    0.0167
-0.0035   -0.0242    0.0368


ans(:,:,2,24) =

    0.0626    0.0347   -0.0042    0.0360
0.0120   -0.0085    0.0127
    0.0280    0.0563    0.0487   -0.0011
0.0645    0.0243    0.0370
   -0.0209    0.0471    0.0061    0.0353
-0.0133    0.0321    0.0443
    0.0230    0.0480    0.0217   -0.0102
-0.0245    0.0039   -0.0156
    0.0114    0.0432   -0.0355   -0.0127
0.0247    0.0182    0.0053
   -0.0113   -0.0458    0.0152   -0.0079
0.0329    0.0008    0.0374
    0.0443   -0.0211    0.0340    0.0093
-0.0063    0.0161    0.0356


ans(:,:,3,24) =

    0.0481    0.0587    0.0431    0.0469
-0.0021    0.0450    0.0407
    0.0341    0.0223    0.0375    0.0259
-0.0153   -0.0120    0.0427
   -0.0077    0.0029   -0.0044    0.0329
0.0298    0.0489   -0.0220
```

```
    0.0003   -0.0071    0.0251   -0.0166
0.0187    0.0431    0.0145
   -0.0329    0.0246   -0.0245   -0.0033
0.0001   -0.0208   -0.0222
   -0.0255    0.0109    0.0277   -0.0453
0.0204   -0.0291   -0.0211
    0.0318    0.0059    0.0191   -0.0232
-0.0296   -0.0092    0.0011


ans(:,:,1,25) =

    0.0158   -0.0227    0.0242    0.0196
-0.0384    0.0391    0.0012
   -0.0052   -0.0104    0.0005    0.0359
-0.0356    0.0145    0.0160
    0.0441    0.0529    0.0320    0.0237
0.0440    0.0032    0.0290
   -0.0321    0.0197    0.0135   -0.0012
-0.0080    0.0418    0.0239
   -0.0389    0.0131    0.0102    0.0183
0.0139    0.0385    0.0056
    0.0156    0.0328    0.0296    0.0039
0.0386   -0.0120    0.0157
    0.0575    0.0167   -0.0149   -0.0375
-0.0201    0.0103    0.0211


ans(:,:,2,25) =

   -0.0020   -0.0228    0.0214    0.0206
0.0338    0.0325    0.0477
    0.0196   -0.0101   -0.0428    0.0124
-0.0161    0.0349   -0.0068
    0.0517   -0.0190   -0.0227    0.0040
0.0233    0.0064    0.0097
   -0.0357    0.0441    0.0458    0.0377
-0.0135   -0.0141    0.0264
    0.0160    0.0442    0.0557    0.0543
0.0364   -0.0066    0.0407
   -0.0090   -0.0368    0.0251   -0.0258
-0.0018   -0.0191    0.0124
    0.0083    0.0398   -0.0065   -0.0238
0.0021   -0.0041   -0.0080


ans(:,:,3,25) =

   -0.0538    0.0097   -0.0443    0.0140
0.0215    0.0096   -0.0043
    0.0280    0.0004    0.0295   -0.0190
0.0330   -0.0004    0.0268
    0.0457   -0.0005   -0.0306   -0.0357
-0.0218   -0.0175    0.0064
    0.0022   -0.0008   -0.0211   -0.0132
-0.0334   -0.0183    0.0469
```

```
   -0.0098    0.0490    0.0579    0.0439
0.0358   -0.0168   -0.0207
    0.0485   -0.0097    0.0146   -0.0271
0.0235    0.0424    0.0296
    0.0116    0.0552    0.0389   -0.0022
0.0384   -0.0067    0.0118


ans(:,:,1,26) =

    0.0017   -0.0298    0.0477    0.0222
-0.0263    0.0318    0.0376
   -0.0272   -0.0343    0.0440   -0.0103
0.0426    0.0555    0.0074
    0.0145    0.0151   -0.0277    0.0138
0.0304    0.0100   -0.0143
   -0.0055    0.0334    0.0422   -0.0081
0.0391   -0.0030    0.0525
   -0.0012   -0.0064    0.0205    0.0227
-0.0209    0.0286    0.0475
    0.0101   -0.0293   -0.0214    0.0401
-0.0175    0.0443   -0.0051
    0.0184   -0.0288    0.0542   -0.0147
0.0018    0.0384   -0.0185


ans(:,:,2,26) =

    0.0383   -0.0194    0.0360    0.0344
0.0519    0.0055    0.0265
    0.0032    0.0080    0.0498   -0.0334
0.0014    0.0093    0.0234
    0.0032    0.0412    0.0415    0.0288
0.0230    0.0254    0.0356
   -0.0403    0.0380    0.0039   -0.0259
0.0361    0.0332   -0.0135
    0.0013   -0.0409    0.0127    0.0195
-0.0090    0.0288    0.0455
   -0.0445    0.0076    0.0376    0.0273
-0.0233   -0.0155   -0.0082
   -0.0129   -0.0121    0.0075    0.0178
-0.0006   -0.0022    0.0497


ans(:,:,3,26) =

    0.0311    0.0410    0.0182    0.0504
-0.0238    0.0385    0.0540
    0.0064   -0.0335   -0.0103    0.0328
0.0117   -0.0035    0.0562
    0.0232    0.0359    0.0397    0.0052
0.0168   -0.0037   -0.0214
   -0.0023    0.0386    0.0436   -0.0049
0.0177    0.0403   -0.0113
   -0.0040   -0.0383   -0.0154   -0.0207
0.0063    0.0068    0.0428
```

```
    0.0130    0.0340    0.0368   -0.0066
-0.0201   -0.0176    0.0379
   -0.0469    0.0015    0.0272    0.0381
0.0550   -0.0189   -0.0236


ans(:,:,1,27) =

    0.0094   -0.0175   -0.0089    0.0062
-0.0111    0.0041   -0.0400
    0.0144    0.0320   -0.0026   -0.0015
0.0098    0.0018    0.0087
    0.0446    0.0391    0.0303    0.0366
0.0590    0.0484   -0.0284
    0.0461    0.0641    0.0393   -0.0075
0.0079    0.0041    0.0358
    0.0024    0.0356    0.0454   -0.0077
0.0314    0.0329   -0.0324
    0.0285    0.0238    0.0176    0.0266
0.0711    0.0582   -0.0054
    0.0608    0.0568   -0.0129    0.0141
-0.0013    0.0722    0.0195


ans(:,:,2,27) =

    0.0560   -0.0025    0.0146    0.0273
-0.0153    0.0115    0.0004
   -0.0240   -0.0300   -0.0272    0.0173
0.0046   -0.0264   -0.0010
    0.0010    0.0212   -0.0054    0.0127
-0.0188    0.0080    0.0035
    0.0355   -0.0078    0.0046   -0.0016
0.0579   -0.0316   -0.0263
    0.0535    0.0525    0.0482    0.0108
-0.0115   -0.0263    0.0320
    0.0168    0.0321    0.0215    0.0386
0.0385    0.0096   -0.0318
   -0.0152    0.0480    0.0486   -0.0132
0.0227    0.0565    0.0410


ans(:,:,3,27) =

    0.0497    0.0420    0.0239    0.0011
0.0423   -0.0138   -0.0338
   -0.0231    0.0081   -0.0352    0.0045
0.0117    0.0181    0.0141
    0.0044   -0.0028   -0.0154    0.0174
-0.0079    0.0299   -0.0221
    0.0468    0.0612    0.0224    0.0173
-0.0227    0.0024   -0.0025
    0.0128    0.0046    0.0325    0.0048
0.0410    0.0218    0.0070
   -0.0059   -0.0050    0.0409    0.0124
0.0291    0.0066    0.0054
```

```
    0.0047   -0.0036    0.0288    0.0063
0.0475    0.0273    0.0317


ans(:,:,1,28) =

   -0.0273   -0.0116   -0.0137   -0.0237
-0.0072   -0.0506   -0.0313
    0.0017   -0.0424    0.0015    0.0036
-0.0130    0.0246   -0.0047
    0.0141   -0.0421   -0.0248   -0.0414
-0.0505   -0.0038   -0.0168
    0.0293   -0.0119    0.0170   -0.0162
-0.0297   -0.0173   -0.0296
   -0.0536   -0.0102   -0.0328   -0.0053
0.0138    0.0236   -0.0410
   -0.0360    0.0178   -0.0183    0.0129
0.0133    0.0041   -0.0365
   -0.0364   -0.0417    0.0137   -0.0034
-0.0378    0.0146    0.0195


ans(:,:,2,28) =

   -0.0431    0.0149   -0.0406    0.0331
-0.0276    0.0159   -0.0051
    0.0281    0.0105    0.0090    0.0265
-0.0075   -0.0492   -0.0150
    0.0033    0.0211   -0.0003    0.0043
-0.0103    0.0279   -0.0424
    0.0226   -0.0229   -0.0185    0.0199
0.0196   -0.0451   -0.0128
   -0.0130   -0.0046   -0.0355   -0.0178
-0.0421   -0.0058   -0.0342
    0.0250   -0.0459   -0.0019   -0.0237
0.0225   -0.0423   -0.0135
    0.0326   -0.0484    0.0216   -0.0431
0.0150   -0.0330    0.0152


ans(:,:,3,28) =

   -0.0404    0.0231   -0.0418   -0.0118
0.0093   -0.0232    0.0313
   -0.0175   -0.0311   -0.0432    0.0212
0.0206   -0.0381    0.0190
    0.0250    0.0317   -0.0055   -0.0163
-0.0223   -0.0386   -0.0163
   -0.0056    0.0157    0.0183    0.0001
0.0085   -0.0074   -0.0209
   -0.0221    0.0062   -0.0436   -0.0087
-0.0093    0.0085    0.0072
   -0.0374   -0.0555   -0.0043   -0.0372
-0.0100   -0.0313   -0.0102
   -0.0224   -0.0115    0.0202   -0.0443
-0.0347   -0.0416   -0.0388
```

```
ans(:,:,1,29) =

   -0.0391   -0.0294    0.0321   -0.0298
0.0199    0.0107   -0.0009
   -0.0422    0.0104   -0.0191   -0.0381
-0.0127    0.0310    0.0465
   -0.0175   -0.0290    0.0089   -0.0284
-0.0231   -0.0163   -0.0202
   -0.0281   -0.0463    0.0419    0.0497
-0.0205   -0.0230    0.0169
    0.0217    0.0318    0.0181   -0.0129
0.0307    0.0222   -0.0182
   -0.0104    0.0181   -0.0207   -0.0197
0.0191    0.0573    0.0096
    0.0072    0.0295   -0.0303    0.0506
0.0192    0.0071    0.0254


ans(:,:,2,29) =

    0.0010    0.0102   -0.0192    0.0251
0.0067    0.0534    0.0038
    0.0351    0.0189    0.0323    0.0353
-0.0050    0.0111    0.0023
    0.0147   -0.0028    0.0338   -0.0156
-0.0195    0.0435   -0.0169
   -0.0445   -0.0377    0.0362    0.0507
0.0430   -0.0200    0.0145
   -0.0254    0.0313    0.0082    0.0486
0.0282   -0.0184   -0.0221
   -0.0187    0.0021    0.0153    0.0005
0.0356    0.0402   -0.0159
    0.0201    0.0109    0.0423    0.0540
0.0456    0.0380    0.0480


ans(:,:,3,29) =

    0.0168    0.0413    0.0001   -0.0000
0.0350    0.0234    0.0095
    0.0023    0.0236   -0.0240   -0.0161
-0.0144    0.0163    0.0382
   -0.0262    0.0319   -0.0051   -0.0133
0.0263   -0.0230   -0.0186
    0.0190    0.0216    0.0060   -0.0216
0.0569    0.0368    0.0123
   -0.0327   -0.0165   -0.0320    0.0283
-0.0186    0.0384    0.0470
   -0.0369   -0.0424    0.0161    0.0030
0.0114    0.0214    0.0524
    0.0149    0.0063    0.0299    0.0298
0.0137    0.0489   -0.0124


ans(:,:,1,30) =
```

```
   -0.0357   -0.0193    0.0074   -0.0321
-0.0069   -0.0372    0.0252
    0.0254   -0.0341    0.0208    0.0225
-0.0425   -0.0422    0.0346
   -0.0397    0.0070   -0.0377    0.0245
-0.0126   -0.0259    0.0129
   -0.0410   -0.0195    0.0291   -0.0102
-0.0140   -0.0164   -0.0088
    0.0009   -0.0287    0.0017   -0.0151
0.0122    0.0150   -0.0466
   -0.0165   -0.0081   -0.0564   -0.0383
-0.0355   -0.0532   -0.0068
    0.0012   -0.0108   -0.0011   -0.0288
0.0168   -0.0456   -0.0239


ans(:,:,2,30) =

    0.0303    0.0279    0.0071   -0.0299
-0.0303    0.0206   -0.0123
   -0.0028   -0.0136    0.0174    0.0239
0.0125   -0.0264   -0.0152
   -0.0272   -0.0384   -0.0349   -0.0532
-0.0545   -0.0483    0.0080
   -0.0325   -0.0241   -0.0403   -0.0509
-0.0352    0.0052   -0.0064
   -0.0246   -0.0092    0.0062    0.0223
0.0267    0.0282   -0.0300
   -0.0503    0.0127    0.0249   -0.0002
-0.0506   -0.0396    0.0180
   -0.0450   -0.0209   -0.0548   -0.0078
0.0012    0.0265   -0.0285


ans(:,:,3,30) =

    0.0256   -0.0417    0.0071   -0.0127
-0.0393   -0.0031    0.0101
   -0.0029    0.0300   -0.0355   -0.0421
-0.0524   -0.0140   -0.0469
   -0.0217    0.0202   -0.0481   -0.0046
-0.0127   -0.0251    0.0007
   -0.0164   -0.0196   -0.0276   -0.0280
-0.0164    0.0282    0.0307
   -0.0284   -0.0400   -0.0317   -0.0239
-0.0254   -0.0161   -0.0005
   -0.0453    0.0126    0.0234   -0.0319
-0.0172   -0.0393    0.0177
   -0.0027   -0.0064    0.0219   -0.0330
-0.0052   -0.0319    0.0067


ans(:,:,1,31) =

   -0.0420   -0.0077   -0.0074   -0.0205
0.0318    0.0082    0.0015
```

```
   -0.0554    0.0325    0.0357    0.0277
0.0152    0.0320   -0.0119
   -0.0269   -0.0442   -0.0261    0.0420
0.0206   -0.0137   -0.0200
    0.0314   -0.0109   -0.0413   -0.0317
0.0522   -0.0002    0.0390
   -0.0550   -0.0434   -0.0326   -0.0100
0.0209    0.0026   -0.0305
    0.0221   -0.0206    0.0112   -0.0263
-0.0292    0.0006   -0.0176
   -0.0208    0.0136   -0.0325    0.0092
-0.0359   -0.0348   -0.0019


ans(:,:,2,31) =

   -0.0303   -0.0413    0.0014    0.0150
-0.0186    0.0087   -0.0097
   -0.0449   -0.0190   -0.0315    0.0066
0.0503    0.0170    0.0067
   -0.0228   -0.0395   -0.0328    0.0180
0.0358    0.0368   -0.0089
    0.0156    0.0058    0.0322   -0.0283
0.0149    0.0092    0.0192
    0.0118   -0.0355   -0.0010   -0.0285
0.0145    0.0361   -0.0308
   -0.0420    0.0139   -0.0286    0.0250
0.0196    0.0013    0.0039
   -0.0398   -0.0421    0.0248   -0.0285
0.0270   -0.0419   -0.0320


ans(:,:,3,31) =

   -0.0564   -0.0065    0.0277    0.0299
-0.0123    0.0072    0.0528
   -0.0215   -0.0154    0.0414    0.0237
0.0488    0.0212    0.0074
   -0.0121    0.0110    0.0101   -0.0168
-0.0113   -0.0154    0.0526
   -0.0490    0.0199   -0.0205    0.0485
0.0252   -0.0276    0.0264
   -0.0373   -0.0147   -0.0461   -0.0144
-0.0161   -0.0043   -0.0238
   -0.0537    0.0280   -0.0121   -0.0220
0.0111   -0.0030    0.0238
    0.0048   -0.0290   -0.0001   -0.0042
0.0194   -0.0488   -0.0364


ans(:,:,1,32) =

   -0.0016   -0.0367   -0.0440   -0.0191
-0.0194   -0.0434    0.0123
   -0.0571   -0.0255   -0.0292   -0.0382
-0.0029    0.0063   -0.0525
```

```
   -0.0292   -0.0539   -0.0118   -0.0482
-0.0258   -0.0356   -0.0057
    0.0209    0.0265    0.0111    0.0259
0.0334    0.0345   -0.0284
   -0.0039    0.0122    0.0225    0.0099
-0.0081   -0.0125    0.0101
    0.0267   -0.0208   -0.0169   -0.0103
-0.0218    0.0043    0.0327
   -0.0150    0.0368   -0.0144   -0.0400
-0.0094   -0.0461   -0.0181


ans(:,:,2,32) =

   -0.0605    0.0032   -0.0482    0.0147
-0.0429   -0.0073    0.0034
   -0.0223   -0.0348   -0.0023   -0.0229
0.0199   -0.0327   -0.0419
    0.0115   -0.0222    0.0320    0.0054
0.0330   -0.0460   -0.0424
   -0.0496    0.0293   -0.0444   -0.0081
-0.0122    0.0356    0.0153
   -0.0019   -0.0030    0.0252   -0.0407
0.0160   -0.0194   -0.0143
    0.0071   -0.0196   -0.0269    0.0314
-0.0030   -0.0303   -0.0384
    0.0380    0.0402   -0.0250    0.0227
0.0319    0.0225   -0.0231


ans(:,:,3,32) =

   -0.0599   -0.0017   -0.0032   -0.0027
-0.0076   -0.0385   -0.0377
   -0.0691   -0.0036   -0.0500   -0.0520
-0.0169    0.0095   -0.0146
   -0.0448   -0.0463   -0.0406   -0.0376
-0.0308   -0.0269   -0.0003
    0.0298    0.0022    0.0323   -0.0117
-0.0093   -0.0062    0.0060
   -0.0271    0.0219    0.0388    0.0233
0.0349    0.0444    0.0409
    0.0076    0.0199   -0.0010    0.0251
-0.0320   -0.0295    0.0066
    0.0085   -0.0166   -0.0259    0.0043
0.0269    0.0036   -0.0141


ans(:,:,1,33) =

    0.0227   -0.0003   -0.0337    0.0213
-0.0209   -0.0262   -0.0441
    0.0247   -0.0046   -0.0480   -0.0502
0.0015   -0.0536   -0.0100
   -0.0603    0.0035   -0.0424   -0.0079
-0.0407   -0.0328   -0.0437
```

```
   -0.0279   -0.0538    0.0192    0.0197
-0.0279    0.0322    0.0191
   -0.0297   -0.0481   -0.0461    0.0123
-0.0094    0.0109   -0.0056
    0.0349    0.0187   -0.0172    0.0204
-0.0436   -0.0332   -0.0470
    0.0113   -0.0318    0.0212    0.0274
0.0247   -0.0399    0.0169


ans(:,:,2,33) =

   -0.0413   -0.0323    0.0008    0.0139
-0.0413   -0.0362   -0.0457
   -0.0075    0.0216   -0.0358   -0.0026
-0.0306    0.0164   -0.0223
    0.0067    0.0075    0.0315   -0.0357
0.0173   -0.0342    0.0258
   -0.0315   -0.0359   -0.0181   -0.0508
-0.0020   -0.0114    0.0308
   -0.0338    0.0142    0.0143    0.0227
-0.0613    0.0061   -0.0375
   -0.0310   -0.0110   -0.0295   -0.0306
-0.0481   -0.0344    0.0265
   -0.0265   -0.0222   -0.0018    0.0283
0.0050   -0.0156   -0.0310


ans(:,:,3,33) =

   -0.0167   -0.0072    0.0284    0.0119
-0.0037   -0.0025   -0.0222
   -0.0504    0.0194    0.0049    0.0041
0.0246   -0.0071   -0.0310
   -0.0225   -0.0277    0.0333   -0.0196
-0.0112   -0.0270   -0.0308
   -0.0496   -0.0194   -0.0379   -0.0285
0.0015    0.0059    0.0222
   -0.0013   -0.0028   -0.0527   -0.0000
-0.0112   -0.0347   -0.0219
   -0.0375    0.0005    0.0028   -0.0155
-0.0540    0.0026   -0.0281
   -0.0233   -0.0323   -0.0149   -0.0155
-0.0483    0.0246    0.0176


ans(:,:,1,34) =

   -0.0428   -0.0431   -0.0164    0.0138
-0.0049    0.0237   -0.0028
   -0.0080    0.0176   -0.0118   -0.0446
-0.0522   -0.0303    0.0187
   -0.0088    0.0207   -0.0173   -0.0512
-0.0623   -0.0491   -0.0469
    0.0119    0.0322   -0.0403   -0.0288
0.0119    0.0216    0.0168
```

```
   -0.0471    0.0013    0.0270   -0.0430
-0.0153   -0.0054   -0.0044
    0.0350    0.0283    0.0033    0.0107
-0.0355    0.0119   -0.0164
    0.0196    0.0201   -0.0050   -0.0268
0.0187   -0.0257   -0.0510


ans(:,:,2,34) =

    0.0325   -0.0491   -0.0122   -0.0541
-0.0232   -0.0087   -0.0455
   -0.0497    0.0283    0.0115   -0.0222
-0.0375   -0.0272    0.0045
    0.0289    0.0262   -0.0263   -0.0232
-0.0641   -0.0594   -0.0364
   -0.0156    0.0266   -0.0452   -0.0253
0.0017   -0.0518    0.0030
   -0.0126   -0.0265   -0.0315   -0.0218
0.0053   -0.0438   -0.0138
    0.0016   -0.0080    0.0192   -0.0153
-0.0052   -0.0359   -0.0055
    0.0393   -0.0153   -0.0288    0.0306
-0.0037   -0.0550    0.0141


ans(:,:,3,34) =

   -0.0307    0.0298   -0.0128    0.0236
-0.0245    0.0203    0.0108
   -0.0065   -0.0141   -0.0449   -0.0670
0.0111   -0.0077   -0.0422
    0.0294   -0.0289    0.0092   -0.0312
-0.0270    0.0118    0.0241
    0.0363   -0.0003   -0.0432   -0.0381
-0.0017   -0.0113    0.0162
   -0.0446   -0.0100   -0.0523   -0.0383
-0.0325   -0.0150    0.0011
   -0.0414   -0.0460    0.0097   -0.0237
0.0030    0.0160   -0.0323
   -0.0105   -0.0283   -0.0270    0.0324
-0.0382   -0.0328    0.0049


ans(:,:,1,35) =

    0.0662   -0.0087   -0.0162   -0.0347
-0.0383   -0.0423    0.0200
    0.0038    0.0290    0.0389   -0.0322
-0.0297    0.0126   -0.0054
    0.0075    0.0003    0.0003   -0.0153
0.0488   -0.0284   -0.0303
    0.0292    0.0086    0.0173    0.0517
0.0412    0.0254   -0.0201
    0.0459   -0.0164    0.0125    0.0590
0.0110    0.0297    0.0135
```

```
   -0.0281    0.0426    0.0569    0.0227
-0.0082    0.0561    0.0326
   -0.0175    0.0161   -0.0103   -0.0085
0.0625    0.0361    0.0104


ans(:,:,2,35) =

    0.0445   -0.0046   -0.0136    0.0355
-0.0259   -0.0135   -0.0244
    0.0445    0.0419    0.0412    0.0012
-0.0225    0.0024   -0.0109
    0.0304    0.0497   -0.0259   -0.0244
0.0483    0.0105   -0.0363
    0.0229   -0.0221    0.0333    0.0202
-0.0215    0.0148    0.0120
   -0.0265    0.0195    0.0438    0.0165
0.0417    0.0612    0.0174
   -0.0310    0.0304    0.0092   -0.0181
0.0293    0.0005   -0.0144
   -0.0244    0.0158    0.0115    0.0213
0.0431    0.0662    0.0262


ans(:,:,3,35) =

    0.0312    0.0344    0.0489   -0.0102
-0.0363    0.0085   -0.0184
   -0.0157    0.0401    0.0368   -0.0159
-0.0138   -0.0265    0.0052
    0.0290    0.0302    0.0417    0.0446
-0.0226    0.0026    0.0149
    0.0521   -0.0255    0.0020    0.0145
0.0474    0.0386   -0.0040
    0.0380   -0.0269    0.0373    0.0031
0.0632    0.0463   -0.0046
    0.0197    0.0279    0.0184   -0.0172
0.0521    0.0379   -0.0130
   -0.0329    0.0229   -0.0016   -0.0170
0.0264    0.0636    0.0799


ans(:,:,1,36) =

   -0.0257    0.0120    0.0190    0.0010
0.0244    0.0276    0.0291
    0.0259   -0.0317    0.0443   -0.0112
0.0044   -0.0090    0.0160
   -0.0289    0.0115    0.0071   -0.0144
0.0259    0.0491    0.0336
   -0.0453    0.0039    0.0024   -0.0143
0.0413   -0.0092   -0.0205
    0.0182    0.0183   -0.0250   -0.0067
0.0069   -0.0111   -0.0130
   -0.0363   -0.0171   -0.0131    0.0292
0.0227   -0.0001    0.0507
```

```
   -0.0342   -0.0247   -0.0397    0.0378
0.0323    0.0388   -0.0077


ans(:,:,2,36) =

   -0.0418    0.0421    0.0420   -0.0243
0.0602   -0.0010    0.0340
   -0.0076    0.0440   -0.0080   -0.0100
0.0302    0.0248    0.0670
    0.0140    0.0049    0.0399   -0.0015
0.0184   -0.0109   -0.0032
   -0.0010   -0.0170    0.0407    0.0430
0.0540    0.0466   -0.0186
    0.0199    0.0329   -0.0250   -0.0058
0.0039   -0.0054    0.0488
    0.0168    0.0045    0.0398    0.0563
0.0415    0.0325   -0.0266
    0.0096    0.0218    0.0001   -0.0293
-0.0186    0.0239    0.0335


ans(:,:,3,36) =

   -0.0250   -0.0204    0.0334    0.0608
0.0667    0.0267    0.0342
   -0.0395   -0.0038    0.0033    0.0399
0.0236    0.0686   -0.0004
    0.0162    0.0422    0.0562   -0.0145
-0.0077   -0.0087   -0.0026
   -0.0365    0.0355   -0.0218    0.0017
0.0355   -0.0088    0.0240
   -0.0312   -0.0186   -0.0183   -0.0192
0.0263    0.0118    0.0532
   -0.0013    0.0262    0.0341   -0.0196
0.0155    0.0162    0.0485
   -0.0364    0.0011    0.0173    0.0475
0.0555   -0.0200    0.0428


ans(:,:,1,37) =

   -0.0209   -0.0433   -0.0070    0.0255
-0.0527    0.0085   -0.0677
    0.0048   -0.0437   -0.0246    0.0206
-0.0004    0.0245    0.0020
    0.0285   -0.0395    0.0276   -0.0399
-0.0079    0.0041   -0.0328
    0.0007   -0.0198   -0.0124    0.0321
-0.0134    0.0181   -0.0339
   -0.0316    0.0116   -0.0265   -0.0040
-0.0426   -0.0421   -0.0414
    0.0105   -0.0376   -0.0163   -0.0227
0.0240    0.0103   -0.0461
    0.0070   -0.0341    0.0250    0.0177
-0.0298    0.0341    0.0252
```

```
ans(:,:,2,37) =

   -0.0069    0.0105   -0.0341   -0.0466
-0.0376   -0.0272   -0.0085
    0.0113   -0.0227   -0.0195    0.0199
0.0102   -0.0440    0.0070
   -0.0053   -0.0176    0.0026   -0.0427
-0.0118    0.0168   -0.0144
   -0.0004    0.0424    0.0395   -0.0207
0.0052    0.0007    0.0058
   -0.0025   -0.0161    0.0026   -0.0034
0.0208    0.0094    0.0275
   -0.0331    0.0046   -0.0241    0.0191
-0.0305    0.0197    0.0249
    0.0064    0.0295   -0.0343    0.0099
0.0280   -0.0025   -0.0397


ans(:,:,3,37) =

   -0.0107   -0.0240   -0.0216    0.0129
-0.0554   -0.0315   -0.0029
   -0.0385   -0.0093   -0.0400    0.0120
-0.0271   -0.0120    0.0053
   -0.0262   -0.0006    0.0049   -0.0468
-0.0423    0.0113   -0.0533
    0.0243    0.0027    0.0322   -0.0058
0.0008   -0.0365    0.0010
    0.0299   -0.0148    0.0088    0.0036
-0.0311   -0.0074   -0.0468
   -0.0389    0.0201   -0.0010   -0.0175
-0.0081   -0.0321   -0.0297
    0.0191   -0.0391   -0.0326   -0.0153
-0.0384   -0.0421    0.0239


ans(:,:,1,38) =

    0.0200    0.0028    0.0309    0.0584
0.0553   -0.0339    0.0210
    0.0122   -0.0188   -0.0285    0.0455
0.0437    0.0394    0.0042
   -0.0027    0.0052   -0.0265   -0.0060
-0.0062   -0.0249   -0.0020
   -0.0022    0.0257    0.0173    0.0422
0.0581   -0.0265    0.0221
    0.0055    0.0365    0.0253    0.0021
0.0552   -0.0313   -0.0533
    0.0604    0.0602   -0.0122    0.0372
0.0426    0.0029   -0.0477
   -0.0129   -0.0064   -0.0092    0.0126
0.0456   -0.0489   -0.0626


ans(:,:,2,38) =
```

```
    0.0665    0.0294   -0.0163    0.0244
0.0358    0.0092   -0.0102
    0.0430    0.0318    0.0064    0.0074
0.0540    0.0288   -0.0533
   -0.0118    0.0246    0.0155    0.0367
0.0284    0.0092    0.0198
   -0.0142   -0.0093    0.0420    0.0042
0.0004   -0.0271   -0.0163
    0.0426    0.0053    0.0595   -0.0119
-0.0013   -0.0255   -0.0055
    0.0483    0.0163    0.0025   -0.0196
0.0347   -0.0384   -0.0001
   -0.0178    0.0137    0.0169    0.0020
0.0264   -0.0482    0.0180


ans(:,:,3,38) =

   -0.0135    0.0473   -0.0129    0.0174
0.0294    0.0363   -0.0230
   -0.0032   -0.0090    0.0003    0.0182
0.0204   -0.0217    0.0165
    0.0238   -0.0067    0.0182    0.0309
0.0115   -0.0180   -0.0074
   -0.0216   -0.0073    0.0070    0.0442
0.0088   -0.0175   -0.0141
    0.0304   -0.0170    0.0396    0.0390
0.0030    0.0278   -0.0322
   -0.0212    0.0184    0.0657   -0.0023
0.0386    0.0283   -0.0112
    0.0010    0.0523    0.0038    0.0216
0.0097   -0.0152   -0.0312


ans(:,:,1,39) =

   -0.0031   -0.0067   -0.0071   -0.0117
-0.0344   -0.0182   -0.0231
    0.0340    0.0114   -0.0244    0.0049
0.0178   -0.0290    0.0020
   -0.0374   -0.0509   -0.0290    0.0191
-0.0072   -0.0237   -0.0179
   -0.0095   -0.0263   -0.0466   -0.0085
0.0095   -0.0054   -0.0039
    0.0417   -0.0060   -0.0317    0.0119
-0.0527   -0.0338   -0.0189
   -0.0204    0.0122   -0.0346    0.0142
-0.0536   -0.0613   -0.0006
    0.0212    0.0055   -0.0157   -0.0364
-0.0721   -0.0232   -0.0305


ans(:,:,2,39) =

    0.0412    0.0009    0.0094   -0.0222
-0.0185   -0.0556   -0.0643
```

```
    0.0110   -0.0280   -0.0395    0.0340
0.0238   -0.0473    0.0170
    0.0342    0.0304   -0.0256   -0.0411
-0.0045   -0.0043   -0.0149
    0.0138   -0.0126    0.0242   -0.0228
-0.0534   -0.0526   -0.0318
    0.0299    0.0154    0.0203   -0.0410
-0.0589   -0.0184   -0.0025
   -0.0333    0.0061   -0.0123   -0.0452
-0.0121   -0.0106   -0.0406
   -0.0108    0.0300   -0.0555   -0.0446
-0.0373   -0.0190   -0.0127


ans(:,:,3,39) =

    0.0185    0.0004    0.0021    0.0405
-0.0215   -0.0023   -0.0610
   -0.0216   -0.0022   -0.0247    0.0251
-0.0201    0.0141   -0.0538
   -0.0097    0.0261   -0.0396    0.0178
-0.0487   -0.0257    0.0032
    0.0255    0.0379   -0.0028   -0.0370
0.0157   -0.0136   -0.0036
    0.0404    0.0407   -0.0317   -0.0035
-0.0027   -0.0336   -0.0379
   -0.0313    0.0108    0.0193   -0.0506
-0.0046    0.0043    0.0083
    0.0271   -0.0042   -0.0063    0.0075
-0.0559   -0.0197   -0.0655


ans(:,:,1,40) =

   -0.0257    0.0037   -0.0557   -0.0202
-0.0578   -0.0370    0.0134
    0.0172    0.0221   -0.0027   -0.0488
0.0006    0.0290    0.0096
   -0.0188   -0.0180    0.0191   -0.0418
0.0142    0.0242   -0.0412
   -0.0122   -0.0052    0.0167    0.0555
0.0498   -0.0156    0.0136
   -0.0434    0.0264   -0.0221    0.0015
0.0299    0.0206   -0.0612
   -0.0328   -0.0064   -0.0373   -0.0312
-0.0349   -0.0123   -0.0722
   -0.0717   -0.0240   -0.0029    0.0218
-0.0142   -0.0293   -0.0143


ans(:,:,2,40) =

   -0.0328   -0.0356   -0.0356   -0.0409
-0.0145   -0.0563   -0.0436
   -0.0183    0.0228   -0.0216   -0.0089
0.0045   -0.0099   -0.0471
```

```
    0.0183   -0.0132   -0.0325   -0.0366
-0.0320    0.0086    0.0102
   -0.0583    0.0259    0.0416    0.0366
0.0280   -0.0297   -0.0325
   -0.0086   -0.0085    0.0344    0.0411
0.0430   -0.0576   -0.0035
   -0.0840   -0.0027    0.0134    0.0264
-0.0305   -0.0291   -0.0261
   -0.0809   -0.0006   -0.0073   -0.0093
-0.0168   -0.0384   -0.0245


ans(:,:,3,40) =

   -0.0018    0.0183   -0.0437   -0.0398
-0.0105   -0.0264   -0.0535
   -0.0426   -0.0213   -0.0482   -0.0339
-0.0185   -0.0158   -0.0193
   -0.0098   -0.0047    0.0366   -0.0069
0.0324    0.0065    0.0164
   -0.0589   -0.0257    0.0106   -0.0053
0.0303    0.0140   -0.0126
   -0.0295    0.0185    0.0040    0.0011
-0.0223    0.0017   -0.0719
   -0.0197   -0.0545    0.0147    0.0034
0.0001   -0.0344   -0.0328
   -0.0852   -0.0411    0.0035    0.0253
-0.0106    0.0001   -0.0384


ans(:,:,1,41) =

   -0.0244    0.0379    0.0465   -0.0185
0.0116    0.0289    0.0061
    0.0356    0.0055    0.0025    0.0362
0.0010   -0.0109    0.0415
    0.0079    0.0358   -0.0056    0.0399
-0.0295   -0.0039    0.0376
    0.0082    0.0439    0.0373    0.0293
-0.0145   -0.0218   -0.0285
    0.0369    0.0215   -0.0081    0.0432
0.0519    0.0470   -0.0031
   -0.0143    0.0121    0.0267    0.0341
0.0074   -0.0154    0.0327
    0.0162    0.0305    0.0421    0.0029
0.0503    0.0621    0.0012


ans(:,:,2,41) =

    0.0137    0.0601    0.0038    0.0034
-0.0229    0.0200    0.0033
    0.0401    0.0199    0.0408    0.0527
0.0051    0.0033   -0.0002
   -0.0029   -0.0154   -0.0213   -0.0054
-0.0133    0.0299   -0.0114
```

```
    0.0411   -0.0098   -0.0156    0.0072
0.0076   -0.0041   -0.0326
    0.0414    0.0049    0.0177    0.0229
0.0194    0.0323    0.0313
    0.0403   -0.0116    0.0484    0.0365
0.0208   -0.0036    0.0456
    0.0367    0.0571    0.0417    0.0015
0.0133    0.0041    0.0639


ans(:,:,3,41) =

   -0.0167    0.0183    0.0087    0.0332
0.0090    0.0273   -0.0009
   -0.0225    0.0436    0.0565    0.0214
0.0341   -0.0040    0.0136
    0.0024    0.0016    0.0220    0.0350
0.0494   -0.0173    0.0202
   -0.0100    0.0633    0.0630   -0.0304
-0.0317   -0.0056    0.0072
   -0.0103    0.0387    0.0441    0.0108
0.0252   -0.0199   -0.0247
    0.0046    0.0494    0.0505    0.0088
0.0061    0.0028    0.0396
   -0.0189    0.0140    0.0361    0.0474
0.0267    0.0416    0.0520


ans(:,:,1,42) =

    0.0141    0.0369    0.0285   -0.0060
-0.0079    0.0066   -0.0615
    0.0206    0.0415    0.0438    0.0433
-0.0504   -0.0613   -0.0372
    0.0285    0.0297    0.0366    0.0162
-0.0262   -0.0408   -0.0014
    0.0064    0.0474    0.0453   -0.0146
0.0041   -0.0458    0.0011
    0.0040   -0.0251   -0.0137    0.0392
-0.0054   -0.0038   -0.0044
    0.0451    0.0171    0.0055   -0.0191
0.0028    0.0102   -0.0564
   -0.0385   -0.0318    0.0011   -0.0514
-0.0513    0.0198   -0.0177


ans(:,:,2,42) =

   -0.0012   -0.0051    0.0736    0.0017
0.0170    0.0157   -0.0713
    0.0506    0.0534    0.0337   -0.0215
-0.0162    0.0068   -0.0797
    0.0569    0.0449    0.0300   -0.0070
-0.0416   -0.0583   -0.0426
   -0.0159    0.0061   -0.0263   -0.0007
-0.0282   -0.0244   -0.0676
```

```
    0.0151    0.0325   -0.0308    0.0213
-0.0527    0.0121   -0.0112
   -0.0203    0.0395    0.0302   -0.0286
-0.0046   -0.0122   -0.0320
    0.0344   -0.0100   -0.0070   -0.0091
-0.0229   -0.0083   -0.0070


ans(:,:,3,42) =

    0.0442    0.0134    0.0315    0.0172
-0.0246   -0.0236   -0.0105
   -0.0019    0.0052    0.0360    0.0094
0.0175   -0.0047   -0.0400
    0.0058   -0.0072    0.0119   -0.0095
0.0282   -0.0555   -0.0215
    0.0452    0.0598    0.0142   -0.0386
-0.0157   -0.0448    0.0099
    0.0485   -0.0048   -0.0269   -0.0080
-0.0473    0.0075   -0.0013
    0.0339    0.0412   -0.0027    0.0005
-0.0517    0.0133   -0.0339
   -0.0033    0.0403    0.0105   -0.0469
-0.0412   -0.0068   -0.0144


ans(:,:,1,43) =

    0.0143    0.0298    0.0279    0.0415
0.0014   -0.0275    0.0328
    0.0081   -0.0221   -0.0114   -0.0169
-0.0196   -0.0164    0.0455
    0.0289    0.0191   -0.0337    0.0222
0.0365   -0.0072    0.0363
    0.0388    0.0353    0.0098   -0.0292
0.0416    0.0364   -0.0155
    0.0273   -0.0246    0.0232    0.0215
-0.0275    0.0208    0.0080
    0.0057    0.0330   -0.0135   -0.0074
-0.0062    0.0141    0.0415
    0.0005    0.0002    0.0258    0.0377
0.0024    0.0399    0.0093


ans(:,:,2,43) =

    0.0007   -0.0112    0.0457   -0.0105
0.0492    0.0191    0.0013
   -0.0197    0.0068    0.0097    0.0283
0.0039    0.0062   -0.0361
    0.0272    0.0452   -0.0126    0.0354
-0.0100   -0.0184    0.0398
   -0.0180   -0.0001    0.0415    0.0216
-0.0202    0.0064    0.0537
   -0.0158   -0.0268   -0.0214    0.0418
-0.0037    0.0388    0.0051
```

```
    0.0441    0.0315    0.0385   -0.0267
-0.0040    0.0078   -0.0041
   -0.0149    0.0496    0.0010    0.0484
0.0099    0.0520   -0.0087


ans(:,:,3,43) =

   -0.0264    0.0332    0.0120    0.0252
0.0225   -0.0018    0.0433
    0.0032    0.0399    0.0559    0.0269
0.0306    0.0049   -0.0133
    0.0310    0.0356   -0.0191    0.0245
0.0260   -0.0191   -0.0221
    0.0089   -0.0223   -0.0350    0.0298
-0.0396    0.0210    0.0122
    0.0445    0.0014    0.0270   -0.0290
0.0016    0.0258   -0.0176
    0.0440    0.0443    0.0101    0.0287
0.0260    0.0524    0.0522
   -0.0171    0.0108    0.0278    0.0207
0.0392    0.0648    0.0056


ans(:,:,1,44) =

    0.0077    0.0212   -0.0245    0.0380
-0.0129    0.0390    0.0485
   -0.0188    0.0476    0.0537    0.0336
-0.0245   -0.0313    0.0277
    0.0381    0.0225   -0.0030    0.0426
0.0324   -0.0160    0.0293
    0.0080   -0.0140   -0.0230   -0.0005
0.0495    0.0020    0.0055
   -0.0245   -0.0305    0.0277    0.0167
0.0458    0.0079    0.0158
   -0.0051    0.0490    0.0272   -0.0291
-0.0082    0.0016    0.0347
    0.0569   -0.0036    0.0462    0.0508
0.0058   -0.0190    0.0457


ans(:,:,2,44) =

    0.0087    0.0084    0.0238   -0.0204
0.0038    0.0462   -0.0258
   -0.0182    0.0092    0.0184   -0.0106
0.0393   -0.0194    0.0348
    0.0475   -0.0321    0.0295    0.0161
-0.0025    0.0103   -0.0113
    0.0162    0.0358    0.0348   -0.0251
0.0519    0.0085   -0.0047
   -0.0011   -0.0137    0.0047   -0.0092
0.0315    0.0486    0.0026
   -0.0215   -0.0028    0.0257    0.0225
-0.0182    0.0194    0.0170
```

```
   -0.0143    0.0427   -0.0248   -0.0271
0.0504    0.0178   -0.0307


ans(:,:,3,44) =

    0.0472    0.0020    0.0487   -0.0205
0.0168   -0.0034    0.0318
   -0.0039    0.0273    0.0553    0.0240
0.0381   -0.0057    0.0465
    0.0178   -0.0361    0.0376    0.0230
0.0348    0.0101    0.0148
    0.0095   -0.0245   -0.0093    0.0406
0.0379    0.0522    0.0093
    0.0465   -0.0103    0.0263   -0.0252
0.0007    0.0048    0.0409
    0.0380   -0.0032   -0.0223    0.0201
-0.0046   -0.0010    0.0492
   -0.0152   -0.0180   -0.0054   -0.0205
0.0087   -0.0050   -0.0118


ans(:,:,1,45) =

    0.0138   -0.0556    0.0056   -0.0477
-0.0691   -0.0357   -0.0299
   -0.0211    0.0095    0.0088   -0.0486
0.0139   -0.0454   -0.0324
   -0.0250    0.0219   -0.0317   -0.0373
-0.0464   -0.0176    0.0221
   -0.0170    0.0250    0.0390    0.0004
0.0151   -0.0328   -0.0249
    0.0227    0.0010    0.0238    0.0273
-0.0025   -0.0211   -0.0183
    0.0040   -0.0171   -0.0096   -0.0042
-0.0291    0.0187   -0.0486
    0.0216   -0.0088   -0.0294   -0.0359
-0.0238   -0.0278   -0.0344


ans(:,:,2,45) =

   -0.0064   -0.0673   -0.0035   -0.0576
-0.0506   -0.0547   -0.0062
    0.0149   -0.0495    0.0004   -0.0475
-0.0504   -0.0253    0.0024
    0.0203   -0.0247    0.0011   -0.0589
-0.0343   -0.0031   -0.0397
   -0.0228   -0.0260    0.0194    0.0268
-0.0436    0.0186    0.0103
   -0.0220    0.0059    0.0431    0.0144
0.0202    0.0021   -0.0167
   -0.0181   -0.0084    0.0337    0.0465
-0.0076   -0.0053    0.0094
    0.0200    0.0156    0.0003   -0.0008
0.0330    0.0206    0.0111
```

```
ans(:,:,3,45) =

   -0.0124   -0.0124   -0.0653   -0.0174
0.0028   -0.0208   -0.0146
   -0.0370   -0.0525   -0.0593   -0.0644
-0.0435   -0.0157   -0.0522
    0.0414   -0.0318   -0.0599   -0.0171
0.0064    0.0161   -0.0542
    0.0330   -0.0278   -0.0256   -0.0455
-0.0110   -0.0228    0.0146
   -0.0434   -0.0329    0.0165    0.0077
-0.0403   -0.0381   -0.0031
   -0.0435    0.0232    0.0511   -0.0030
-0.0228    0.0004   -0.0612
    0.0232   -0.0260    0.0368    0.0119
0.0222    0.0044   -0.0234


ans(:,:,1,46) =

   -0.0300   -0.0191    0.0225    0.0183
-0.0145    0.0380    0.0051
    0.0211   -0.0068    0.0070    0.0395
0.0283   -0.0134   -0.0213
    0.0014    0.0417    0.0384    0.0191
0.0559    0.0222    0.0048
    0.0479   -0.0154    0.0272   -0.0019
0.0351   -0.0155    0.0483
   -0.0040    0.0347   -0.0204    0.0485
0.0414   -0.0016    0.0560
   -0.0186    0.0433   -0.0125    0.0250
-0.0016    0.0086    0.0007
   -0.0018    0.0046    0.0290    0.0385
0.0420    0.0022    0.0258


ans(:,:,2,46) =

    0.0074   -0.0238    0.0268    0.0478
-0.0182    0.0327    0.0473
    0.0185   -0.0115    0.0086   -0.0050
0.0339   -0.0289    0.0280
    0.0470    0.0263    0.0446    0.0173
0.0153   -0.0206   -0.0212
   -0.0134   -0.0181    0.0404   -0.0115
0.0091   -0.0247   -0.0076
   -0.0111    0.0224   -0.0218    0.0182
0.0143    0.0120    0.0392
    0.0071   -0.0161    0.0289    0.0356
0.0569    0.0425   -0.0151
    0.0277   -0.0122    0.0208   -0.0230
0.0030    0.0216   -0.0234


ans(:,:,3,46) =
```

```
    0.0129   -0.0143    0.0364    0.0079
0.0300    0.0414    0.0261
    0.0372    0.0412   -0.0216    0.0158
0.0182   -0.0163    0.0302
   -0.0099    0.0422   -0.0189   -0.0104
-0.0041    0.0565    0.0603
    0.0265   -0.0008    0.0109    0.0435
0.0147    0.0095    0.0215
    0.0291   -0.0181    0.0303    0.0035
0.0329    0.0465    0.0113
   -0.0122   -0.0255    0.0146   -0.0027
0.0077    0.0126    0.0252
   -0.0210    0.0133    0.0412    0.0098
-0.0177   -0.0305   -0.0033


ans(:,:,1,47) =

    0.0543    0.0112   -0.0295    0.0148
-0.0143    0.0481   -0.0084
    0.0034    0.0162    0.0297   -0.0132
0.0300   -0.0290    0.0087
    0.0350    0.0374    0.0390   -0.0184
-0.0343   -0.0022   -0.0133
    0.0246   -0.0063    0.0288   -0.0305
-0.0171   -0.0047   -0.0191
    0.0266   -0.0265   -0.0044    0.0469
-0.0123   -0.0028    0.0552
    0.0411    0.0092   -0.0015    0.0254
-0.0375    0.0029    0.0270
    0.0539    0.0433   -0.0011    0.0149
-0.0068    0.0120    0.0059


ans(:,:,2,47) =

    0.0191    0.0393   -0.0207    0.0005
-0.0387    0.0434    0.0155
    0.0204    0.0657    0.0239   -0.0339
0.0142    0.0266    0.0114
    0.0687    0.0568   -0.0088    0.0455
0.0349    0.0193   -0.0186
   -0.0021    0.0590    0.0251   -0.0148
-0.0295   -0.0148    0.0400
    0.0110   -0.0241   -0.0254    0.0198
0.0424    0.0188    0.0445
   -0.0169    0.0363    0.0435   -0.0312
-0.0358   -0.0164    0.0138
    0.0115    0.0436    0.0096   -0.0142
-0.0269    0.0370    0.0431


ans(:,:,3,47) =

    0.0373   -0.0151    0.0395    0.0137
0.0219    0.0303   -0.0053
```

```
    0.0727    0.0584    0.0431    0.0205
0.0328    0.0241    0.0466
    0.0495    0.0604   -0.0049   -0.0267
0.0034    0.0142    0.0549
    0.0461   -0.0021   -0.0123   -0.0299
-0.0136    0.0276    0.0351
    0.0569   -0.0223    0.0162    0.0128
0.0358    0.0473   -0.0235
    0.0030   -0.0176    0.0085    0.0142
-0.0323    0.0474    0.0042
   -0.0213   -0.0107    0.0466   -0.0156
0.0170    0.0040    0.0442


ans(:,:,1,48) =

    0.0180   -0.0210   -0.0135   -0.0424
0.0070    0.0265   -0.0193
    0.0209   -0.0307    0.0110   -0.0129
-0.0408   -0.0186   -0.0398
   -0.0347   -0.0506   -0.0232    0.0038
-0.0390   -0.0448   -0.0282
   -0.0002   -0.0034   -0.0277    0.0161
0.0075    0.0161   -0.0113
    0.0238   -0.0301   -0.0499   -0.0246
-0.0312    0.0295   -0.0061
   -0.0143    0.0394   -0.0289   -0.0234
0.0096    0.0057   -0.0318
   -0.0117   -0.0144    0.0257    0.0044
-0.0385   -0.0301   -0.0119


ans(:,:,2,48) =

   -0.0067    0.0247    0.0207    0.0157
0.0158   -0.0340    0.0254
    0.0155   -0.0288    0.0050   -0.0408
-0.0491   -0.0283   -0.0072
    0.0025    0.0189   -0.0112   -0.0130
0.0022   -0.0375   -0.0168
    0.0310    0.0050   -0.0355   -0.0427
-0.0448   -0.0261   -0.0261
    0.0187    0.0277   -0.0113    0.0180
0.0252   -0.0152    0.0085
   -0.0224    0.0248    0.0072   -0.0118
0.0288   -0.0091   -0.0161
    0.0311    0.0141   -0.0377    0.0294
0.0145    0.0062   -0.0137


ans(:,:,3,48) =

   -0.0464   -0.0226   -0.0432    0.0099
-0.0069   -0.0273   -0.0025
   -0.0260    0.0264    0.0040   -0.0021
-0.0179   -0.0474   -0.0328
```

```
   -0.0057    0.0251   -0.0301   -0.0403
0.0344    0.0009    0.0180
    0.0006   -0.0242    0.0128   -0.0151
-0.0407   -0.0496    0.0072
   -0.0310   -0.0403    0.0067   -0.0336
-0.0076    0.0294   -0.0352
   -0.0187   -0.0194   -0.0331    0.0089
-0.0316   -0.0172    0.0231
    0.0310    0.0408   -0.0337   -0.0381
0.0202   -0.0313   -0.0278


ans(:,:,1,49) =

    0.0224   -0.0532   -0.0035   -0.0368
-0.0590   -0.0712   -0.0598
   -0.0074   -0.0610    0.0122   -0.0720
-0.0194   -0.0691    0.0027
    0.0123   -0.0095   -0.0187    0.0061
-0.0431   -0.0372    0.0162
   -0.0332   -0.0395   -0.0511    0.0058
-0.0103   -0.0365   -0.0045
    0.0244   -0.0060   -0.0382   -0.0093
-0.0114   -0.0128    0.0169
    0.0082    0.0186    0.0192    0.0179
0.0174    0.0081   -0.0355
    0.0084    0.0117    0.0010    0.0295
0.0304   -0.0368    0.0294


ans(:,:,2,49) =

   -0.0407   -0.0224   -0.0343   -0.0200
-0.0031   -0.0461   -0.0654
    0.0062   -0.0417   -0.0416    0.0054
-0.0648   -0.0655    0.0016
   -0.0553    0.0026   -0.0410   -0.0382
-0.0497   -0.0397   -0.0364
   -0.0043   -0.0115   -0.0073    0.0279
-0.0083    0.0140   -0.0414
   -0.0275   -0.0039   -0.0032   -0.0222
0.0019   -0.0052    0.0158
   -0.0200   -0.0199    0.0231    0.0307
0.0251    0.0049   -0.0078
    0.0243   -0.0098   -0.0247   -0.0273
0.0168    0.0020   -0.0273


ans(:,:,3,49) =

   -0.0031    0.0100   -0.0728   -0.0440
-0.0620   -0.0057   -0.0174
   -0.0171   -0.0385    0.0005   -0.0070
-0.0390   -0.0337   -0.0422
   -0.0434    0.0120   -0.0103   -0.0264
0.0082   -0.0459    0.0010
```

```
    0.0240   -0.0518   -0.0309    0.0184
-0.0090    0.0039   -0.0078
   -0.0392    0.0201   -0.0344    0.0407
-0.0219   -0.0356    0.0265
    0.0041   -0.0029    0.0507   -0.0097
0.0334    0.0421   -0.0300
    0.0370   -0.0234   -0.0194   -0.0191
0.0136   -0.0317    0.0321


ans(:,:,1,50) =

    0.0113    0.0194    0.0173   -0.0274
0.0434    0.0391    0.0359
    0.0046    0.0290    0.0239    0.0266
-0.0375    0.0336    0.0246
   -0.0325    0.0421   -0.0264    0.0040
0.0085   -0.0136   -0.0190
    0.0293   -0.0218    0.0526    0.0096
0.0745   -0.0104    0.0513
   -0.0380   -0.0027    0.0091    0.0348
0.0311    0.0361    0.0223
   -0.0490    0.0079    0.0084    0.0240
0.0291    0.0252   -0.0014
    0.0171   -0.0265    0.0132   -0.0271
0.0188    0.0323    0.0683


ans(:,:,2,50) =

    0.0032    0.0054    0.0484    0.0378
0.0206    0.0114   -0.0309
    0.0289   -0.0257    0.0167    0.0013
0.0147   -0.0195   -0.0238
   -0.0280   -0.0220    0.0265    0.0365
0.0442    0.0447    0.0206
   -0.0107    0.0428   -0.0166    0.0427
-0.0076    0.0060   -0.0104
   -0.0156    0.0266    0.0168    0.0095
0.0554    0.0177    0.0085
   -0.0184   -0.0466    0.0213   -0.0126
0.0213    0.0412    0.0557
   -0.0198   -0.0073    0.0091   -0.0352
0.0435    0.0044    0.0175


ans(:,:,3,50) =

    0.0236   -0.0204   -0.0284   -0.0305
-0.0052   -0.0026   -0.0209
    0.0152   -0.0101    0.0284   -0.0149
0.0265    0.0174    0.0224
    0.0031    0.0319   -0.0361    0.0382
0.0631    0.0162    0.0199
   -0.0337   -0.0221    0.0519    0.0468
0.0576    0.0636   -0.0184
```

```
   -0.0215    0.0208    0.0225    0.0082
0.0387    0.0364    0.0182
   -0.0591    0.0272    0.0047    0.0337
0.0262    0.0774    0.0231
   -0.0519   -0.0169   -0.0373    0.0074
-0.0272   -0.0061    0.0108


ans(:,:,1,51) =

    0.0170    0.0118   -0.0028    0.0243
0.0354   -0.0106   -0.0317
   -0.0064   -0.0124    0.0256    0.0262
0.0451    0.0427   -0.0089
   -0.0002    0.0371   -0.0316   -0.0209
-0.0324    0.0131   -0.0389
   -0.0105   -0.0064    0.0249    0.0187
-0.0312   -0.0221   -0.0011
    0.0082   -0.0040    0.0090    0.0126
-0.0248   -0.0142    0.0118
    0.0530    0.0268   -0.0224    0.0398
0.0480    0.0322   -0.0223
    0.0449    0.0282   -0.0082    0.0264
-0.0044    0.0547    0.0167


ans(:,:,2,51) =

    0.0407    0.0403    0.0496   -0.0154
-0.0090    0.0369    0.0326
    0.0580    0.0469   -0.0262   -0.0040
0.0464    0.0188   -0.0406
   -0.0080    0.0091   -0.0264   -0.0010
-0.0175   -0.0158   -0.0041
   -0.0270   -0.0113    0.0036    0.0109
0.0207    0.0260    0.0151
    0.0352    0.0409    0.0129    0.0103
-0.0219    0.0220    0.0253
    0.0554    0.0407    0.0247    0.0127
0.0235    0.0282   -0.0282
   -0.0038    0.0164   -0.0187    0.0007
0.0310    0.0628   -0.0083


ans(:,:,3,51) =

    0.0482    0.0042    0.0205   -0.0187
0.0119   -0.0103   -0.0306
    0.0397   -0.0065    0.0140    0.0444
-0.0234    0.0156   -0.0432
    0.0526   -0.0299    0.0135   -0.0216
-0.0172   -0.0348    0.0093
    0.0322    0.0134    0.0467   -0.0342
-0.0132    0.0021    0.0360
    0.0487    0.0174    0.0121    0.0155
-0.0092   -0.0158    0.0010
```

```
    0.0364    0.0112    0.0114    0.0139
0.0431    0.0438    0.0087
   -0.0033    0.0514   -0.0107    0.0402
0.0159    0.0582    0.0607


ans(:,:,1,52) =

    0.0385    0.0111    0.0225    0.0352
-0.0294   -0.0100   -0.0207
   -0.0243    0.0048   -0.0145    0.0379
-0.0035   -0.0081    0.0177
   -0.0272   -0.0160    0.0028   -0.0148
0.0290   -0.0038   -0.0290
   -0.0116   -0.0120   -0.0317    0.0279
-0.0363   -0.0237    0.0212
   -0.0499   -0.0503   -0.0205   -0.0296
-0.0126   -0.0382    0.0102
   -0.0359   -0.0113    0.0078    0.0037
-0.0042    0.0112    0.0139
    0.0050   -0.0326   -0.0284   -0.0101
-0.0242   -0.0452    0.0153


ans(:,:,2,52) =

   -0.0242    0.0183   -0.0283   -0.0329
0.0113   -0.0388    0.0279
   -0.0107   -0.0030   -0.0091    0.0033
0.0025   -0.0338    0.0081
    0.0450    0.0133   -0.0285   -0.0016
-0.0249   -0.0079   -0.0307
   -0.0046    0.0245    0.0310   -0.0034
-0.0047    0.0220    0.0194
   -0.0104   -0.0284   -0.0462   -0.0316
0.0073   -0.0145   -0.0256
   -0.0055    0.0171   -0.0290   -0.0357
-0.0477    0.0034   -0.0367
   -0.0442   -0.0400    0.0077    0.0323
0.0247   -0.0305   -0.0096


ans(:,:,3,52) =

   -0.0295    0.0310   -0.0214    0.0188
-0.0249   -0.0139   -0.0191
   -0.0069   -0.0389   -0.0139   -0.0047
0.0375   -0.0301   -0.0050
    0.0360    0.0083   -0.0154   -0.0150
0.0376   -0.0058    0.0133
    0.0275    0.0100   -0.0096   -0.0175
-0.0240   -0.0334    0.0150
    0.0017   -0.0188    0.0205   -0.0352
-0.0130   -0.0321   -0.0426
    0.0124   -0.0189    0.0149   -0.0257
-0.0176   -0.0017   -0.0153
```

```
   -0.0072    0.0062   -0.0377   -0.0352
-0.0470   -0.0407    0.0211


ans(:,:,1,53) =

    0.0056   -0.0359   -0.0220   -0.0330
0.0053   -0.0508   -0.0512
   -0.0014   -0.0180   -0.0050   -0.0351
-0.0042   -0.0074    0.0205
   -0.0428   -0.0198   -0.0122    0.0132
0.0276    0.0116    0.0081
    0.0207   -0.0223   -0.0398    0.0230
-0.0431   -0.0349   -0.0277
    0.0011    0.0374   -0.0183    0.0279
0.0081    0.0170   -0.0609
    0.0334   -0.0055   -0.0071   -0.0200
0.0254   -0.0241   -0.0506
    0.0012    0.0499   -0.0208   -0.0009
-0.0434   -0.0404   -0.0450


ans(:,:,2,53) =

   -0.0542   -0.0269   -0.0045   -0.0295
0.0128   -0.0259   -0.0074
   -0.0481    0.0245    0.0089   -0.0314
-0.0115    0.0234   -0.0573
    0.0102    0.0000    0.0219    0.0065
-0.0172    0.0183   -0.0072
   -0.0085   -0.0357    0.0228   -0.0381
0.0303   -0.0291   -0.0107
    0.0255    0.0347    0.0178    0.0178
0.0249   -0.0165    0.0112
   -0.0305   -0.0250    0.0044   -0.0347
-0.0038    0.0011    0.0070
    0.0185    0.0121   -0.0065   -0.0408
0.0309   -0.0358   -0.0050


ans(:,:,3,53) =

   -0.0114   -0.0174    0.0105    0.0150
-0.0154    0.0251   -0.0121
   -0.0465   -0.0362   -0.0319   -0.0416
-0.0475   -0.0559    0.0053
   -0.0226    0.0118    0.0343   -0.0061
-0.0325    0.0084   -0.0357
   -0.0212   -0.0329   -0.0304   -0.0321
0.0363   -0.0338   -0.0213
   -0.0204   -0.0371   -0.0418   -0.0006
-0.0048   -0.0469   -0.0040
    0.0035    0.0092    0.0326   -0.0331
0.0340   -0.0053   -0.0590
    0.0225   -0.0255    0.0394   -0.0348
-0.0303   -0.0259   -0.0219
```

```
ans(:,:,1,54) =

    0.0004   -0.0188   -0.0298    0.0106
-0.0439   -0.0248    0.0183
   -0.0314    0.0191   -0.0564   -0.0278
-0.0326   -0.0166    0.0315
    0.0097   -0.0042   -0.0477   -0.0046
0.0067   -0.0015   -0.0307
    0.0314   -0.0350   -0.0017    0.0036
-0.0167   -0.0124    0.0041
    0.0227    0.0333    0.0304   -0.0018
-0.0343   -0.0065    0.0533
    0.0274   -0.0482   -0.0179    0.0121
0.0022    0.0143    0.0210
    0.0262    0.0109   -0.0416   -0.0138
0.0082   -0.0013    0.0216


ans(:,:,2,54) =

   -0.0088   -0.0247   -0.0112   -0.0319
0.0203    0.0060   -0.0136
    0.0197    0.0106   -0.0253   -0.0389
-0.0357   -0.0222   -0.0195
   -0.0132   -0.0347   -0.0230    0.0046
-0.0229    0.0295   -0.0166
   -0.0129    0.0224    0.0328   -0.0506
-0.0086   -0.0263   -0.0109
   -0.0177   -0.0392    0.0136    0.0316
-0.0073    0.0088    0.0264
   -0.0473   -0.0074   -0.0395   -0.0470
0.0157   -0.0211    0.0605
    0.0122   -0.0430   -0.0496   -0.0488
-0.0351   -0.0258    0.0230


ans(:,:,3,54) =

   -0.0153   -0.0306   -0.0054   -0.0030
0.0033   -0.0293   -0.0331
    0.0078    0.0148   -0.0074   -0.0222
0.0212   -0.0522    0.0014
    0.0169    0.0170   -0.0177    0.0045
-0.0373   -0.0302    0.0258
   -0.0386   -0.0190   -0.0448   -0.0508
0.0071   -0.0329   -0.0052
   -0.0011   -0.0338    0.0194    0.0240
0.0054    0.0039   -0.0085
   -0.0374   -0.0279   -0.0313   -0.0112
0.0025    0.0121    0.0353
   -0.0324   -0.0391   -0.0343   -0.0103
-0.0111    0.0277    0.0349


ans(:,:,1,55) =
```

```
   -0.0197   -0.0014   -0.0303   -0.0029
0.0649    0.0280   -0.0049
    0.0266   -0.0071   -0.0046    0.0132
-0.0050    0.0014    0.0597
   -0.0044    0.0483    0.0415   -0.0169
0.0078    0.0410   -0.0009
    0.0339    0.0465    0.0327   -0.0167
0.0270    0.0524   -0.0006
   -0.0155    0.0347   -0.0019   -0.0338
0.0275    0.0005    0.0463
   -0.0166    0.0107    0.0194   -0.0130
0.0046    0.0362   -0.0371
    0.0133   -0.0172    0.0056    0.0068
-0.0090   -0.0311   -0.0302


ans(:,:,2,55) =

    0.0114    0.0254    0.0321    0.0329
0.0582   -0.0084    0.0020
    0.0072   -0.0270    0.0050    0.0528
0.0535    0.0656    0.0590
    0.0366    0.0169   -0.0205    0.0551
0.0517    0.0218    0.0001
    0.0098    0.0019   -0.0067   -0.0249
0.0300   -0.0280    0.0124
   -0.0302    0.0228   -0.0009    0.0063
-0.0442   -0.0316    0.0360
   -0.0250   -0.0080   -0.0044   -0.0152
0.0151   -0.0048   -0.0339
    0.0142    0.0229    0.0040    0.0400
0.0362    0.0337    0.0256


ans(:,:,3,55) =

    0.0383    0.0260    0.0488    0.0400
0.0594    0.0157    0.0365
    0.0135    0.0395    0.0360   -0.0022
0.0557    0.0183    0.0553
    0.0075    0.0545    0.0427    0.0402
-0.0107   -0.0032    0.0531
    0.0040   -0.0202   -0.0101    0.0315
0.0177    0.0376    0.0559
   -0.0363    0.0003   -0.0064    0.0287
0.0065    0.0105    0.0177
    0.0440   -0.0039   -0.0280   -0.0206
0.0169   -0.0277   -0.0138
    0.0246    0.0303    0.0010   -0.0331
-0.0417    0.0158    0.0359


ans(:,:,1,56) =

    0.0489    0.0129   -0.0089   -0.0209
-0.0172   -0.0398   -0.0281
```

```
    0.0237    0.0103   -0.0177   -0.0358
0.0003   -0.0253    0.0122
   -0.0203    0.0327    0.0017   -0.0296
-0.0086   -0.0264   -0.0486
    0.0426   -0.0395   -0.0255    0.0074
-0.0615   -0.0182   -0.0124
    0.0306    0.0264   -0.0079    0.0133
0.0080    0.0105   -0.0191
    0.0359    0.0159    0.0456    0.0220
0.0337    0.0009    0.0039
    0.0470    0.0465   -0.0069    0.0457
0.0391    0.0131    0.0062


ans(:,:,2,56) =

    0.0366   -0.0131    0.0316    0.0132
-0.0000   -0.0509   -0.0151
    0.0387    0.0189    0.0448   -0.0541
-0.0409    0.0126   -0.0468
   -0.0226    0.0409   -0.0354   -0.0357
-0.0368   -0.0285    0.0065
   -0.0242    0.0347    0.0048   -0.0264
-0.0615   -0.0303   -0.0637
   -0.0270   -0.0075    0.0254   -0.0094
0.0022    0.0056    0.0139
   -0.0067    0.0340    0.0071   -0.0347
-0.0200    0.0283    0.0310
    0.0343    0.0231   -0.0169    0.0269
-0.0096    0.0219    0.0113


ans(:,:,3,56) =

    0.0175    0.0086   -0.0252   -0.0460
0.0206    0.0181   -0.0089
   -0.0291    0.0104    0.0448   -0.0092
0.0033   -0.0138    0.0046
    0.0116   -0.0327   -0.0435   -0.0536
-0.0372   -0.0341   -0.0468
    0.0475   -0.0110   -0.0145   -0.0435
-0.0350   -0.0519   -0.0202
   -0.0140    0.0232   -0.0141    0.0278
0.0178   -0.0388   -0.0025
   -0.0255   -0.0161    0.0246   -0.0071
-0.0311    0.0320   -0.0016
   -0.0190    0.0339    0.0446    0.0117
0.0282   -0.0314   -0.0174


ans(:,:,1,57) =

    0.0179   -0.0031    0.0158    0.0424
0.0597    0.0004    0.0044
    0.0204    0.0412    0.0552    0.0061
-0.0182   -0.0188   -0.0225
```

```
   -0.0196    0.0156   -0.0227   -0.0122
0.0295    0.0450    0.0159
    0.0509    0.0435    0.0417   -0.0259
-0.0144    0.0490    0.0529
   -0.0107    0.0135    0.0258   -0.0430
-0.0052    0.0037    0.0578
   -0.0293    0.0204   -0.0049    0.0391
0.0396    0.0399    0.0402
   -0.0026   -0.0009    0.0036   -0.0399
-0.0315   -0.0148    0.0048


ans(:,:,2,57) =

    0.0146    0.0583    0.0256    0.0539
0.0302    0.0301    0.0461
    0.0339    0.0467    0.0388    0.0171
0.0552   -0.0249   -0.0021
    0.0382    0.0324    0.0414   -0.0263
0.0267    0.0325   -0.0191
    0.0168    0.0523    0.0023   -0.0049
0.0045    0.0346    0.0484
    0.0027    0.0258   -0.0402   -0.0252
0.0172   -0.0161    0.0181
    0.0115    0.0379   -0.0010   -0.0079
0.0444   -0.0168   -0.0001
   -0.0059   -0.0328    0.0214   -0.0117
0.0476   -0.0058    0.0618


ans(:,:,3,57) =

   -0.0014    0.0251   -0.0126    0.0546
0.0442   -0.0016    0.0227
    0.0674    0.0353   -0.0205    0.0066
-0.0115   -0.0009    0.0160
    0.0252    0.0087   -0.0139    0.0082
0.0282    0.0319   -0.0059
    0.0235   -0.0168   -0.0059    0.0050
0.0130    0.0547    0.0267
    0.0040    0.0367   -0.0149   -0.0357
-0.0010    0.0125    0.0176
    0.0264    0.0192   -0.0241   -0.0338
-0.0048   -0.0127   -0.0146
    0.0085    0.0470    0.0026   -0.0326
-0.0051   -0.0138    0.0089


ans(:,:,1,58) =

   -0.0079    0.0033   -0.0247   -0.0057
0.0307    0.0321   -0.0191
   -0.0183    0.0037   -0.0041   -0.0096
-0.0191    0.0123   -0.0015
    0.0512    0.0225    0.0496   -0.0058
-0.0216   -0.0174   -0.0368
```

```
   -0.0152   -0.0091   -0.0194    0.0435
-0.0196   -0.0262   -0.0288
   -0.0295   -0.0136    0.0403    0.0057
0.0257   -0.0233    0.0056
   -0.0311    0.0286    0.0530    0.0157
0.0327    0.0142    0.0192
   -0.0053    0.0272    0.0295   -0.0248
-0.0170    0.0187    0.0344


ans(:,:,2,58) =

    0.0420   -0.0213    0.0125    0.0293
0.0191    0.0424   -0.0160
    0.0357    0.0231    0.0192    0.0608
0.0449    0.0285    0.0337
   -0.0046   -0.0128    0.0327    0.0187
-0.0082    0.0418   -0.0112
    0.0264   -0.0093    0.0342    0.0228
-0.0203    0.0309   -0.0134
    0.0522    0.0369   -0.0200    0.0351
0.0337    0.0172    0.0260
    0.0434    0.0427   -0.0268   -0.0216
0.0197    0.0021    0.0340
   -0.0045    0.0274    0.0365    0.0059
-0.0168    0.0041    0.0178


ans(:,:,3,58) =

    0.0345    0.0375   -0.0125   -0.0051
0.0285    0.0485    0.0152
    0.0529   -0.0033    0.0426    0.0537
-0.0212    0.0558   -0.0321
    0.0269   -0.0274    0.0346    0.0165
0.0144    0.0471   -0.0057
   -0.0335    0.0194    0.0206    0.0013
-0.0138    0.0449    0.0002
    0.0201    0.0108    0.0285    0.0027
-0.0081    0.0394   -0.0276
   -0.0215   -0.0104   -0.0314    0.0436
0.0140    0.0288    0.0206
   -0.0368    0.0361   -0.0266   -0.0200
-0.0279    0.0212    0.0133


ans(:,:,1,59) =

    0.0381    0.0047   -0.0158    0.0525
-0.0112    0.0348    0.0442
    0.0647    0.0487    0.0290    0.0586
-0.0295    0.0060   -0.0320
   -0.0082   -0.0115    0.0001    0.0416
0.0377   -0.0144    0.0452
    0.0044   -0.0243   -0.0113   -0.0363
0.0252   -0.0046    0.0082
```

```
   -0.0385   -0.0252   -0.0430   -0.0458
0.0327    0.0337    0.0119
    0.0323   -0.0055   -0.0028    0.0295
0.0316    0.0164    0.0276
    0.0426    0.0318    0.0147   -0.0358
-0.0161    0.0383   -0.0070


ans(:,:,2,59) =

    0.0134    0.0531    0.0288   -0.0169
-0.0137   -0.0052    0.0166
    0.0603    0.0480   -0.0069    0.0524
0.0028   -0.0196    0.0000
    0.0361   -0.0101   -0.0078    0.0045
0.0220    0.0503    0.0125
    0.0238    0.0339   -0.0024   -0.0311
0.0249    0.0135    0.0468
   -0.0092    0.0226   -0.0234   -0.0127
-0.0122   -0.0314   -0.0316
    0.0194    0.0079   -0.0182   -0.0321
0.0088   -0.0372    0.0085
   -0.0298   -0.0015   -0.0064    0.0047
-0.0162    0.0091    0.0213


ans(:,:,3,59) =

    0.0169    0.0055    0.0103   -0.0206
-0.0222    0.0382    0.0281
    0.0252   -0.0156    0.0496    0.0423
0.0056    0.0162    0.0209
   -0.0061    0.0336    0.0275    0.0158
0.0436    0.0266    0.0412
    0.0296    0.0525   -0.0334    0.0047
-0.0388   -0.0227   -0.0184
   -0.0314   -0.0225    0.0127    0.0379
0.0224   -0.0150    0.0206
    0.0270    0.0320    0.0197   -0.0317
-0.0295    0.0345   -0.0314
   -0.0220    0.0376    0.0176    0.0087
-0.0396    0.0298    0.0085


ans(:,:,1,60) =

    0.0121    0.0077    0.0024    0.0086
0.0348   -0.0012    0.0235
    0.0064   -0.0236   -0.0060   -0.0338
-0.0231    0.0060   -0.0216
    0.0239    0.0126   -0.0360    0.0255
0.0301    0.0228   -0.0033
   -0.0452   -0.0322   -0.0573   -0.0220
-0.0191   -0.0350   -0.0314
   -0.0435   -0.0519    0.0084   -0.0036
0.0281   -0.0080    0.0134
```

```
   -0.0507    0.0216   -0.0034    0.0257
-0.0174    0.0241    0.0042
   -0.0087    0.0197   -0.0080    0.0172
-0.0457   -0.0009    0.0041


ans(:,:,2,60) =

   -0.0263   -0.0152    0.0117    0.0078
-0.0261   -0.0142   -0.0276
    0.0026   -0.0328   -0.0130    0.0334
-0.0415   -0.0442    0.0213
   -0.0158   -0.0300   -0.0313    0.0207
0.0040   -0.0155    0.0307
   -0.0020    0.0143   -0.0598   -0.0507
0.0344   -0.0040    0.0244
    0.0249   -0.0573   -0.0064   -0.0009
-0.0340    0.0311   -0.0206
   -0.0493   -0.0461   -0.0505   -0.0242
0.0235    0.0051   -0.0348
    0.0113   -0.0558   -0.0508   -0.0097
0.0222    0.0037   -0.0289


ans(:,:,3,60) =

    0.0143   -0.0178    0.0317   -0.0215
0.0047    0.0303   -0.0479
   -0.0003   -0.0014   -0.0298    0.0049
0.0256   -0.0272    0.0277
   -0.0342   -0.0096   -0.0050   -0.0045
0.0333   -0.0279   -0.0419
    0.0265    0.0127   -0.0565   -0.0288
0.0027    0.0045    0.0185
   -0.0007    0.0198   -0.0432   -0.0211
-0.0450   -0.0076   -0.0006
   -0.0447   -0.0189   -0.0272   -0.0491
-0.0311    0.0159    0.0320
    0.0099   -0.0196   -0.0543   -0.0086
-0.0318    0.0264   -0.0287


ans(:,:,1,61) =

    0.0065    0.0423   -0.0156    0.0118
-0.0038    0.0298    0.0179
    0.0382   -0.0323    0.0304    0.0046
0.0175    0.0429    0.0157
    0.0483   -0.0159   -0.0326    0.0345
0.0076   -0.0198   -0.0202
    0.0184   -0.0017    0.0273    0.0014
0.0039   -0.0016   -0.0004
    0.0075    0.0331    0.0309   -0.0183
0.0150   -0.0265    0.0244
    0.0588   -0.0204   -0.0167    0.0299
-0.0286    0.0417    0.0567
```

```
   -0.0288   -0.0228    0.0342   -0.0164
0.0256    0.0125    0.0651


ans(:,:,2,61) =

    0.0417    0.0213   -0.0191   -0.0004
0.0468    0.0401    0.0457
    0.0301    0.0029    0.0172    0.0176
0.0065    0.0481    0.0213
    0.0359    0.0099   -0.0307   -0.0051
-0.0132   -0.0047   -0.0097
    0.0284   -0.0203   -0.0162   -0.0158
0.0444    0.0087    0.0563
   -0.0022   -0.0148   -0.0260   -0.0261
0.0079    0.0075   -0.0070
    0.0520   -0.0028    0.0358    0.0177
0.0269   -0.0163    0.0015
   -0.0093    0.0153    0.0073   -0.0108
-0.0009    0.0175    0.0288


ans(:,:,3,61) =

   -0.0108    0.0151    0.0195    0.0007
0.0050    0.0267   -0.0178
    0.0255    0.0363    0.0138   -0.0143
0.0236    0.0516    0.0172
   -0.0204    0.0063    0.0315    0.0122
-0.0201    0.0419    0.0328
    0.0084    0.0436    0.0361    0.0211
0.0367   -0.0219    0.0455
    0.0430    0.0341   -0.0071   -0.0419
-0.0386    0.0366   -0.0046
    0.0152   -0.0150    0.0303   -0.0252
-0.0033   -0.0004    0.0638
   -0.0106    0.0267   -0.0025    0.0388
0.0160    0.0174    0.0214


ans(:,:,1,62) =

   -0.0152   -0.0035   -0.0651   -0.0625
-0.0477   -0.0459    0.0047
   -0.0573    0.0160   -0.0130   -0.0632
-0.0044   -0.0210    0.0188
   -0.0399    0.0025   -0.0075   -0.0304
0.0136   -0.0333   -0.0144
   -0.0169    0.0218   -0.0484    0.0138
-0.0419    0.0174   -0.0092
   -0.0443   -0.0380    0.0133   -0.0365
-0.0304    0.0100   -0.0010
    0.0147    0.0134   -0.0606   -0.0021
-0.0367   -0.0096   -0.0111
   -0.0416   -0.0515    0.0011   -0.0135
-0.0124    0.0302   -0.0275
```

```
ans(:,:,2,62) =

    0.0321   -0.0328    0.0015    0.0157
-0.0546   -0.0381   -0.0227
   -0.0220   -0.0439    0.0120    0.0137
-0.0590    0.0088   -0.0261
   -0.0303    0.0073   -0.0051    0.0040
-0.0244   -0.0107    0.0372
   -0.0375   -0.0266   -0.0284   -0.0473
-0.0411   -0.0164   -0.0002
   -0.0363   -0.0161   -0.0109   -0.0178
-0.0298   -0.0119   -0.0093
    0.0073   -0.0471    0.0047    0.0128
-0.0320   -0.0476    0.0212
   -0.0433    0.0187   -0.0299    0.0167
-0.0294    0.0160    0.0102


ans(:,:,3,62) =

   -0.0446    0.0261   -0.0411    0.0024
-0.0490   -0.0192    0.0272
    0.0002   -0.0585    0.0111   -0.0078
-0.0300   -0.0436   -0.0382
   -0.0042   -0.0049   -0.0107   -0.0127
-0.0284    0.0218    0.0047
    0.0221   -0.0115   -0.0406    0.0246
-0.0480    0.0066    0.0043
   -0.0410   -0.0168   -0.0106   -0.0502
0.0194   -0.0579    0.0076
    0.0065   -0.0298   -0.0243   -0.0086
-0.0389   -0.0396    0.0289
    0.0070   -0.0012    0.0134   -0.0144
0.0231    0.0285    0.0392


ans(:,:,1,63) =

    0.0269    0.0218   -0.0201    0.0054
0.0404    0.0113   -0.0195
    0.0121   -0.0170    0.0098    0.0112
-0.0235    0.0201   -0.0397
   -0.0052   -0.0373   -0.0282   -0.0323
0.0480   -0.0402    0.0141
   -0.0288    0.0131   -0.0087   -0.0237
0.0405    0.0378   -0.0201
   -0.0355   -0.0156    0.0041   -0.0345
-0.0065   -0.0306   -0.0453
   -0.0567   -0.0354   -0.0605    0.0103
0.0215    0.0202   -0.0144
    0.0174    0.0094    0.0150   -0.0407
-0.0598   -0.0395    0.0014


ans(:,:,2,63) =
```

```
   -0.0271   -0.0040    0.0296   -0.0120
-0.0095   -0.0422   -0.0347
    0.0454   -0.0066   -0.0280   -0.0285
-0.0301    0.0115    0.0156
    0.0201   -0.0344    0.0151   -0.0093
0.0418    0.0210   -0.0107
   -0.0196   -0.0420   -0.0042    0.0075
0.0149   -0.0193   -0.0222
   -0.0013   -0.0411   -0.0429    0.0198
-0.0119   -0.0316    0.0141
    0.0076   -0.0079   -0.0087   -0.0180
0.0091    0.0266    0.0127
   -0.0367    0.0120    0.0032   -0.0527
-0.0023   -0.0174    0.0057


ans(:,:,3,63) =

    0.0030   -0.0373    0.0251    0.0040
-0.0244   -0.0047   -0.0363
    0.0332   -0.0292    0.0015    0.0027
0.0025   -0.0058   -0.0517
   -0.0281   -0.0080   -0.0214    0.0085
-0.0182   -0.0431   -0.0403
   -0.0007   -0.0048    0.0252    0.0086
-0.0078   -0.0188    0.0317
   -0.0185   -0.0055   -0.0182    0.0081
0.0325    0.0255    0.0035
   -0.0423   -0.0602   -0.0082   -0.0390
-0.0473   -0.0398    0.0046
   -0.0387   -0.0038   -0.0534   -0.0554
-0.0183   -0.0461   -0.0039


ans(:,:,1,64) =

    0.0222    0.0096   -0.0160   -0.0101
0.0202    0.0103    0.0414
    0.0109    0.0124   -0.0176    0.0269
-0.0016   -0.0178    0.0065
    0.0283   -0.0073   -0.0036   -0.0031
-0.0106    0.0043    0.0165
   -0.0138   -0.0071    0.0377    0.0029
-0.0250   -0.0503    0.0153
    0.0080    0.0413    0.0468    0.0495
0.0446    0.0269   -0.0293
    0.0555   -0.0096    0.0427    0.0645
-0.0127    0.0243    0.0243
    0.0227    0.0240    0.0189    0.0463
0.0087   -0.0235    0.0082


ans(:,:,2,64) =

    0.0076    0.0058    0.0564   -0.0165
0.0220   -0.0047   -0.0127
```

```
   -0.0260    0.0222    0.0231    0.0215
-0.0094    0.0004    0.0111
   -0.0305   -0.0074   -0.0272    0.0048
0.0161   -0.0178   -0.0288
   -0.0191   -0.0247    0.0145    0.0122
0.0398    0.0271   -0.0194
   -0.0255    0.0360    0.0053    0.0180
-0.0122    0.0401    0.0117
    0.0017    0.0189    0.0340    0.0561
0.0493   -0.0015   -0.0162
    0.0010    0.0459    0.0201    0.0321
-0.0032   -0.0098    0.0116


ans(:,:,3,64) =

    0.0405   -0.0114   -0.0147    0.0004
0.0199    0.0110   -0.0297
    0.0253    0.0549   -0.0065   -0.0312
0.0157   -0.0168   -0.0216
    0.0468    0.0375   -0.0257   -0.0155
-0.0075    0.0276    0.0374
    0.0150    0.0155    0.0535   -0.0128
0.0022   -0.0114   -0.0338
    0.0336   -0.0095    0.0411   -0.0113
0.0095    0.0249    0.0277
    0.0028    0.0433    0.0588    0.0647
0.0360   -0.0276   -0.0023
    0.0036    0.0180    0.0175   -0.0099
-0.0139    0.0315   -0.0074
```